Center to Promote Health in the New England Workplace (CPHNEW)
Grant Number 1U19 OH008857
Grant period: July 1, 2006, to June 30, 2011
Report Date: November 20, 2011

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Project D

List of Terms and Abbreviations:

CDMT:	Cross-Disciplinary Methods Team
DHHS:	Department of Health and Human Services (U.S.)
DOC:	Department of Corrections (Connecticut)
EAC:	External Advisory Committee
GHCC:	Genesis HealthCare Corporation
HP:	Health Promotion
NIOSH:	National Institute for Occupational Safety and Health
OHS:	Occupational Health and Safety
PI:	Principal Investigator
PHP:	Participatory Health Promotion
ROI:	Return on Investment
R2P:	Research to Practice
SC:	Steering Committee
SRHP:	Safe Resident Handling Program
WHP:	Workplace Health Promotion
WLI:	WorkLife Initiative (at NIOSH – now called "Total Worker Health")
WRCL:	Worksite Readiness Checklist

Center, project and institution names:

CPH-NEW:	Center for the Promotion of Health in the New England Workplace
A. ProCare:	"Promoting Physical and Mental Health of Caregivers through Trans-disciplinary Intervention"
B. HITEC:	"Health Improvement through Training and Employee Control (HITEC)"
C. "Stress@Work" (Education, Translation, Communication and Dissemination)	
D. R2P Toolkit:	An Research to Practice (R2P) Toolkit for establishing sustainable workplace health protection/promotion programs"
UML:	University of Massachusetts Lowell
UConn:	University of Connecticut

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Abstract

The Center for the Promotion of Health in the New England Workplace (CPH-NEW) is a cross-disciplinary collaboration involving investigators from the University of Massachusetts Lowell (UML) and the University of Connecticut (UConn), along with numerous external partners. **Research Project A**, "Promoting Physical and Mental Health of Caregivers through Trans-disciplinary Intervention (ProCare)," involved a major East Coast provider of nursing home and assisted living care. A safe resident handling program (SRHP) was shown to result in more handling device use and lower physical loading for nursing assistants, fewer back injury claims and good return on investment (ROI). Sites with 1) SRHP only were compared to those with 2) both SRHP and company-sponsored health promotion (HP) programs; and 3) SRHP plus a participatory HP program (PHP) facilitated by the investigators. Neither HP program resulted in measurable HP benefits but did enhance SRHP ROI; the PHP had higher employee engagement than company-sponsored HP. **Research Project B**, "Health Improvement through Training and Employee Control (HITEC)," compared separate, top-down HP and OHS interventions with an experimental program integrating the HP and OHS content, based in employee-led participatory "Design Teams." The sites were paired within sector (manufacturing and corrections) on the basis of intervention type. The manufacturing sites experienced dramatic downsizing during the project, preventing follow-up of subjects. In corrections, the Design Teams were so favorably received that both management and labor virtually abandoned the "top-down" approach. The **Education, Translation, Communication and Dissemination project (C)**, "Stress@Work," qualitatively assessed knowledge and perceptions of health professionals regarding work-related stress and feasibility of interventions initiated by health professionals. Results informed the development of curriculum and on-line materials used in training sessions to increase practitioner awareness about a) the causal association between work-related stress and cardiovascular disease, and b) workplace interventions that emphasize primary prevention through improved work organization. Major dissemination activities partnered with the MA Heart and Stroke Partnership, the MA DPH "Working on Wellness" program, and the MA/Rhode Island Chapter of the Employee Assistance Professionals Association. In Years 4-5, **Project D**, "A Research-to-Practice (R2P) Toolkit," developed and field-tested practical, participatory intervention tools for employers and health professionals, responding to needs identified within the research projects.

The Center projects and Cross-Disciplinary Methods Teams (CDMT) interacted in a number of ways to enhance learning and R2P efforts. Both ProCare and HITEC identified a need for strategies to engage center administrators as allies in the work of the Design Teams, which led to development of several Toolkit tools. The Implementation CDMT sought generalizable approaches to achieving integration of OHS and HP, focusing on flexible design and continuous improvement, rather than assuming a single solution would fit all contexts. Thus CPH-NEW has developed an integrative and comprehensive approach to reduce workforce hazards and promote worker health, identifying the links between workplace culture and personal high-risk behaviors and supporting iterative adaptation and improvement of workplace interventions. CPH-NEW has also met key translational and effectiveness research goals by developing targeted methods and accessible assessment instruments, and by proposing a multi-dimensional productivity/business case approach.

Scientific Report

Background

The Center for the Promotion of Health in the New England Workplace (CPH-NEW) implements and evaluates multiple models for integrating health promotion with occupational health interventions, with a strong emphasis on musculoskeletal, cardiovascular, and mental health outcomes; the underlying role of work organization; and the importance of worker involvement in program goal-setting, design and implementation. This integrated approach is to be contrasted with merely providing OHS and workplace wellness programs in parallel. Parallelism of study approaches, personnel, and instruments has facilitated assessment of the effectiveness of combining health protection with health promotion, including identification of untapped opportunities as well as obstacles in the traditional public health infrastructure.

The Center is a joint initiative of the University of Massachusetts Lowell (Work Environment, Economics, Community Health & Sustainability, Nursing) and the University of Connecticut (Occupational & Environmental Medicine, Occupational Health Psychology, Allied Health Sciences, Health Promotion), with numerous private and public sector partners (Figure 1).

The cross-disciplinary nature of the Center rests on project- and methodology- oriented teams as well as strongly established relationships among the investigators named as Key Personnel on the specific proposals. The regional focus is based on the involvement of two major public university systems with numerous cooperative agreements with government institutions, labor organizations and private sector health and safety professionals. Outstanding features of these partnerships include more than a decade of collaborative work between the university-based investigators that has crossed multiple academic departments and free-standing research centers.

Figure 1. CPH-NEW members and partners
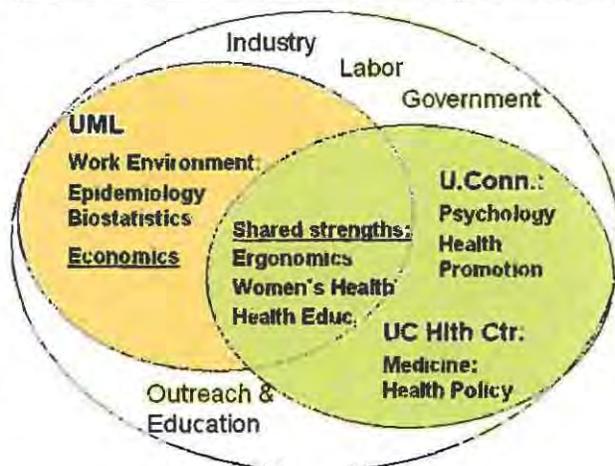
Organizational Structure of the Center

The Center's Administrative Core does not have specific aims or research methods, per se. However, throughout Years 1-5, the core activities have been key to coordination among projects and personnel, effective joint strategizing, and development of common methods, literature, and interpretation. Evaluation of the Center was also based in the Administrative Core. This Scientific Report is therefore organized according to area of activity, beginning with Core infrastructure and continuing with conduct of the individual projects, their ability to inform each other, and cross-project comparisons and conclusions.

Center Administration/Steering Committee

The Center Core was the organizational base for convening the Steering Committee, the External Advisory Committee, semi-annual center-wide personnel meetings, and the Cross-Disciplinary Methods Teams (CDMTs). Beginning in Year 1, the Administrative Core established effective procedures for center administration, as described below. Other Core tasks included maintaining the Center website and Wiki page; overseeing reporting; working with NIOSH intramural agreements; maintaining data transfer policies; and implementing project data protection and human subject de-identification procedures.

The Center Co-Principal Investigators throughout the grant period were Drs. Punnett and Cherniack, who were also individual project PI's (Projects A and B, respectively). Dr. Champagne and Ms. Nobrega were co-PI's of the Translation/Dissemination Project (C), and Dr. Henning was PI of Project D (R2P Toolkit). Key administrative staff members were the Center Administrator based at UML and Dr. Jeffrey Dussetschleger, the project manager based in Connecticut.

Having two PIs, instead of the more usual structure of PI and Program Manager, generated some concerns regarding potentially overlapping responsibilities on the part of the original reviewers in 2006. In practice, this approach to inter-institutional organization has promoted participation and cooperation, consistent with a cross-disciplinary project. This was the assessment of the outside reviewers (see below) and was corroborated by ongoing effectiveness and conciseness of the weekly Steering Committee meeting.

Drs. Punnett and Cherniack co-chaired the Steering Committee (SC), the internal decision-making body of the Center. The SC was comprised of virtually all Key Personnel, including the project and sub-contract PI's and the Center Administrator. The SC assisted the principal investigators to make scientific, budgetary and administrative decisions relevant to each project; planned the full Center personnel and Advisory Committee meetings; oversaw the activities of the CDMTs specifically and inter-campus communications in general; reviewed applications to the Affiliates program (below); and monitored overall progress of the Center towards the established goals, including project deliverables. Other typical agenda items included HITEC site recruitment, common instrument development and strategies for participatory research methods, sharing of data and coordinating writing among investigators, design and content of website and print outreach materials, response to inquiries received from other institutions, center-wide evaluation activities, development of Project D (The R2P Toolkit), and coordinating participation in research conferences and the NIOSH WorkLife Initiative. The Steering Committee met weekly, primarily by telephone conference call but utilizing interactive digital video transmission whenever deemed desirable.

Semi-annual center-wide personnel meetings provided opportunities for more in-depth discussion and for less formal networking. Full project personnel meetings began even before the grant period, in May 2006, with subsequent meetings at least twice per year. The regular semi-annual joint research retreat already in existence provided an opportunity for presentation of Center activities for discussion by personnel from all three university campuses.

Center-wide communication was also facilitated by creating an internal Wiki site to provide a shared repository for internal working documents, ranging from survey instruments to draft manuscripts and reports. (This served a different purpose from the Center website, described below under "Outreach.") These communication mechanisms were paralleled by within-project efforts, such as biweekly in-person meetings (ProCare), conference calls on a weekly (HITEC) or monthly (Toolkit) basis to ensure coordination among personnel on all three campuses.

Overall, the self-governance mechanisms in place proved sufficiently flexible to accommodate changing needs over time while supporting accountability. Center researchers and staff have established a collaborative environment with minimal inter-institutional friction, represented by numerous cross-project activities of the key personnel and adapted to evolving study needs. The Center has successfully incorporated junior researchers and students into cross-disciplinary projects. One example of successful self-governance is the CPH-NEW Authorship Agreement (Appendix Core-1), a document created in Year 1 to encourage collaborative manuscript-writing while establishing key principles of accountability in use of project data. The collegiality and academic cooperation of CPH-NEW investigators likely rests both on long-standing working relations and on the design and function of the administrative core. In either case, the process has worked well in the eyes of staff and affiliates and those of outside reviewers.

Cross-Disciplinary Methods Teams

As described in our 2005 application, the Cross-Disciplinary Methods Teams were part of the solution to the dual considerations of multiple institution coordination and a modestly funded administrative core. Instead of a single statistical core, the four CDMTs, summarized in the table below, served as common resources to all projects. Each team was designed to address a different methodological challenge, and had co-chairs on two different campuses.

Table 1. CPH-NEW Cross Disciplinary Methods Teams

Team (Name in Year 1)	Original Team Leader(s)	Activity
Economics	Supriya Lahiri, Tim Morse	Evaluate cost-benefit and cost-effectiveness of research project interventions
Health promotion*	Pouran Faghri	Review key literature and discuss issues germane to integration with traditional OHS
Qualitative research*	Marian Flum	Compare approaches across studies; ensure intellectual rigor and quality for the Center evaluation process
* These two teams were merged in Year 3 to create the "I-Team" (Integration & Intervention)		
Survey measures and biometrics	Susan Reisine & Rebecca Gore	Compile common pool of measures to maximize comparability of data collected; coordinate analytic approaches and provide expertise in multi-level statistical modeling and other advanced techniques

Each team engaged researchers from several content areas and methodological backgrounds, and team leadership recognized the breadth of expertise among Center investigators. In general the CDMTs had cross-project review and advisory functions and served as a forum for exchange of experience from the different projects. They proved quite valuable in facilitating development of common concepts and processes for undertaking interventions in the field.

The Economics and Biometrics teams were small but active throughout the entire award period. The Economics Analysis Team discussed data collection needed to permit future planned analyses of program cost-effectiveness. The Survey Measures and Biometrics Team functioned by electronic communication to share, review, and comment on project instruments and to develop preliminary data analyses for psychometric evaluation of survey measures. A similar process took place in the Qualitative Research Team, although with less intensity.

Initially the Health Promotion Team was extremely active, communicating very frequently to share literature, discuss approaches to and evidence for workplace health promotion programs, pursue efforts to integrate methodologies (e.g., participatory ergonomics with health promotion). The members collaborated to develop a checklist for evaluation of workplace health promotion and protection needs and programs by walkthrough and structured interview. The Worksite Readiness Checklist (WRCL) was pilot tested in both Project A (6 GHCC sites) [Faghri] and Project B (2 DOC sites) in 2008. This initiative led to collaborative development of one workshop and several abstracts for the NIOSH Work Life Initiative meeting in September, 2007 (see list of presentations in Appendix Core-2).

As the two research projects progressed, the Health Promotion and Qualitative Research teams decided to merge in order to integrate WHP and OSH activities more effectively and to support common approaches to workplace intervention. The Implementation/Integration Team ("I-

Team") met first in early 2008, to share literature, discuss approaches to and evidence for workplace health promotion programs, and pursue efforts to integrate methodologies (e.g., participatory ergonomics with health promotion). Specific attention was focused initially on the participatory interventions in Projects A and B. The goal was to pool investigator learning from quantitative and qualitative assessments and from worksite intervention experiences to inform coordinated Center policies and practices for implementing integrated participatory health activities. By the end of Year 5, the I-Team had become the most active and widely represented CDMT, serving as a cross-project bridge to coordinate intervention approaches and assist with WHP/OHS integration. This effort also led directly to development of the R2P Toolkit project (D).

The CDMT activities were assessed by internal and external review (see below and Appendix Core-3). The general process was quite successful in achieving cross-project participation in design of research instruments and alignment of methods, although reporting from the Teams was ad hoc and sometimes sporadic. The evaluators had three specific recommendations to improve effectiveness, which the CPH-NEW Steering Committee addressed in the renewal application for Years 6-10: 1) to clarify the charge and leadership of each team, with greater orientation to specific tasks; 2) to establish regular meeting schedules for each team; and 3) to improve communication between teams and projects as well as to the CPH-NEW Steering Committee.

Last, a new, ad-hoc Evaluation Team was created in Year 4 and operated until the end of the award period. This team comprised several members of the Steering Committee, including the PI. Its goal was to coordinate assessment of process, successes, and obstacles within each team as well as cross-project evaluation of the center's work. During Years 4-5, it reviewed the overall progress of the Center against the evaluation metrics described in the original application and to identify specific reporting responsibilities within the Center toward eventual preparation of this Final Report. The team also took responsibility for seeking and selecting the external reviewer engaged late in Year 4 and preparing the questions to be addressed in that review.

External Advisory Committee

The External Advisory Committee (EAC) comprised a small group of representatives from academia, business, labor, state government, and the practitioner community. Each member was selected for a background relevant either to worksite health promotion or occupational safety and health, experience with worker involvement in interventions, and/or ability to enhance consideration of different constituent groups' perspectives. All original EAC members have remained and several new members were added in Years 1-3, as other researchers and practitioners approached us with interest. Advisory Committee members have also been consulted individually on specific topics relevant to their expertise. Membership as of Year 5 is shown in the table.

Table 2. External Advisory Committee Members

EAC Member	Position, Organization
Evelyn Bain, RN	Associate Director Emerita for Health and Safety, Massachusetts Nurses Association
Ian Brissette, PhD	Director, Chronic Disease and Risk Factor Surveillance Unit, Bureau of Chronic Disease Epidemiology and Surveillance, New York State Department of Health
Letitia Davis, ScD	Director, Occupational Health Surveillance Program, Massachusetts Department of Public Health
Lisa Erck	Massachusetts Department of Public Health

Jeffrey Fisher, PhD	Professor and Director, Department of Psychology, UConn (Storrs)
Michael Fitts	Executive Director, Connecticut Council for Occupational Safety and Health
Katherine Foell	Massachusetts Department of Public Health
Bruce Koeppen, MD	Dean, Academic Affairs and Education, University of Connecticut School of Medicine
Donna LaBombard, RN, MS	Genesis HealthCare Corporation; later Cooley-Dickinson Hospital (Northampton, MA)
Paul Landsbergis, PhD	Associate Professor, SUNY Downstate Medical University
Michelle Robertson, PhD	Center for Behavioral Science, Liberty Mutual Research Institute for Safety
David Roy	Vice President of Claims Engineering, Travelers Insurance Company
Peter Schnall, MD, MPH	Clinical Professor of Medicine, University of California Irvine
Adam Seidner, MD, MPH	Medical Director, Travelers Insurance Company
Thomas St. Louis, MSPH	Occupational Health Program Director, Connecticut Department of Public Health
David Wegman, MD, MPH	Professor Emeritus, School of Health and Environment, UML

The EAC met once or twice per year, usually for two hours, with members participating by a combination of in-person, interactive video and telephone. Project progress was communicated primarily through written materials, so that the meetings could focus on areas where AC members might be able to provide assistance and guidance (e.g., site recruitment for Project B, the proposed structure for center affiliation, strategies for regional outreach, Toolkit content, and how to participate most effectively in the NIOSH WorkLife Initiative).

Twice the EAC included or was preceded by a presentation by a member of the Committee. Dr. Ian Brissette spoke on process evaluation (June 20, 2007, in Storrs, CT, with videoconferencing to Lowell); and Dr. Peter Schnall spoke on work stress (January 29, 2009, in Lowell, MA, with videoconferencing to Storrs).

The functions and effectiveness of the External Advisory Committee during Years 1-5 were assessed by internal review as well as by the CHPR external reviewers. Specific recommendations for strengthening the EAC and its input to the Center's work included expanding the length of meetings, consistently convening in person (rather than by video or telephone), adding more individuals with WHP expertise, and adding practitioners or employer representatives who could advise specifically on the Research-to-Practice translational work. These improvements were all introduced in the renewal application for Years 6-10.

Research Affiliates

The Research Affiliates program arose in Year 4 out of the mutual interest of CPH-NEW researchers and other scientists outside the NIOSH-funded Center projects to develop stronger collaborative relationships aligned with the Center's mission. Affiliates are investigators who have both interest and potential to contribute to the mission of CPH-NEW, regardless of their home institution. Potential collaboration may take the form of research grant-writing related to the CPH-NEW mission, participation in already funded projects (in-kind), co-authorship of manuscripts with CPH-NEW investigators, contributions to educational and outreach activities, or serving as external advisors to graduate students who work on Center projects.

The structure is described in a formal document (Appendix Core-4). Potential Affiliates apply to the Steering Committee with a letter of interest and a C.V. Once approved by the SC, affiliate status continues as long as there is active engagement in any relevant activity. Research Affiliates have access to CPH-NEW instruments and other materials and may participate in Center meetings and research retreats. They may also request pre-submission grant review through the Center of large external grants planned for submission; this offers the opportunity for an internal review by one or more experienced investigators.

By the end of Year 5, a total of twelve investigators not directly involved in any NIOSH-funded Center projects had sought and achieved Affiliate status. Five are from UConn, one from UML, two from UMass Medical School, and five from other institutions (Appendix Core-5). Several of these investigators have submitted grant applications for separate external funding (below) that do or would involve CPH-NEW personnel and methods. This broad level of interest demonstrates the perceived value of Center paradigms and methods to other members of the research community in both OHS and WHP disciplines.

External Partners

Throughout the award period, the Center enjoyed the support and participation of several key private and public sector partners. St. Paul Travelers (STA) is a leading national worker's compensation carrier that sponsors client-centered risk reduction activities (Loss Prevention and Control) and is pursuing control of group health and worker's compensation risk control through its collaboration with Metropolitan Life (Synchrony). Genesis HealthCare Corporation is a major East Coast provider of nursing home and assisted living care, which has aggressively implemented and expanded a set of safety and ergonomics management/prevention programs since 1998. The Liberty Mutual Research Institute for Safety (LRMIS), Hopkinton, Massachusetts, has conducted research in the area of injury prevention and safety for 50 years and is the only OSH research facility owned and operated by an insurance company. The Massachusetts Nurses Association has an active research department concerned with issues such as staffing, work schedules, and injury risk and has provided valuable feedback to other UML studies in the healthcare sector. The Connecticut Council for Occupational Safety and Health is a labor-based community organization that has participated with UConn on an OSHA Susan Harwood Training grant in ergonomics, and also performs hazardous waste worker training and work with migrant farmworkers. The Massachusetts Council for Occupational Safety and Health is a similar organization with long-standing relationships to UML investigators. The Massachusetts and Connecticut Departments of Public Health have both been active in surveillance of occupational injury and illness and sponsor a variety of educational and prevention activities.

Outreach

External contributions of CPH-NEW included active participation in the NIOSH WLI consortium of Centers of Excellence and co-authorship of WLI policy documents and practice recommendations [1, 2]. We submitted public comments on several policy initiatives, such as development of quality standards for workplace health promotion programs by the National Committee for Quality Assurance (2007) and the draft U.S. DHHS National Prevention and Health Promotion Strategy (2010).

Other outreach included international networking to identify investigators with overlapping expertise and practitioners whose work could inform specific Center activities. One mechanism for engaging these colleagues more closely with the Center was the development of the Research Affiliates program (above).

Web-Based Dissemination

In Year 1, the initial Center website content was written and the site map developed. The UML site went "live" (www.uml.edu/centers/CPH-NEW) at the beginning of Year 2, after final design of the CPH-NEW logo. This was followed by production of promotional materials, including a Center brochure and a poster for recruiting employers to Project B, and activation of a mailing list sign-up form on the CPH-NEW website.

Also early in Year 2, a feature entitled "CPH-News and Views" was added to the website. This is a series of short factsheets from individual Center researchers on relevant topics, almost all written in a style intended to be useful for non-academic readers such as employers, labor union representatives, safety or wellness practitioners. These are posted as two-page pdf-formatted documents which can be printed back-to-back on one sheet each. Topics have ranged from the health effects of prolonged standing to strategies for instituting effective employee exercise programs. A new issue was posted approximately every two months throughout Years 2 to 5. These can all be viewed on our website (URL above).

According to UML internal tracking, the number of visits to the Center website has increased steadily over three years (see table below). The proportion of international visitors increased markedly, including visits from Europe, Asia, and Australia since the beginning. For example, in the past year, 5.5% were from South Korea and 2.3% from Canada. A decreasing proportion came through "direct traffic," representing any of the following: 1) the visitor typed the CPHNEW directly into his/her browser; 2) the visitor bookmarked CPHNEW; or 3) the visitor clicked on a shortcut, e-mail or other direct link. In contrast, a higher percentage reached us through a commercial search engines.

Table 3. Number of Visits to the CPH-NEW Website (UML)

Period:	7/1/08-3/31/09	7/1/09 – 4/1/10	7/1/10 – 5/31/11
Total visits	5,544	6,482	14,081
Daily average number	20	46	52
Average visit duration	> 12 min.	> 17 min.	6:18 min.
Visitors from outside the U.S.	26%	32%	44%
Visitors from direct traffic	60%	58%	40%
Visitors through the UML.edu website	15%	13%	12%
Visitors through google.com website	11%	12%	24%

UConn Health Center (UCHC) maintains a related website which provides basic information on CPH-NEW and refers users to the more complete information on the UML website. UCHC has access only to more limited data on website activity. Activity for CPH-NEW pages on the UCHC website was obtained for March through June of 2011. The average daily activity for the main landing page (http://oehc.uchc.edu/healthywork/index.asp) for that period was approximately 13 visits per day. There were approximately 3 visits per day each for related subpages that describe the individual projects, services available, team members, partners, and objectives. Information was not available either on visit origins nor on average time spent per visit.

Participation in the consortium of NIOSH Centers of Excellence to Promote a Healthier Workforce

Early in Year 1, immediate contact was also made with the Iowa Center (the only other center funded that year) in an attempt to initiate collaboration. A member of that group participated by teleconference in the CPHNEW all-personnel meeting in October, 2006.

CPH-NEW personnel participated very actively in the NIOSH Worklife Initiative meeting held in February, 2008, in Boston. In addition to presenting the center's research framework and results to date of each project, we contributed to all three working groups through input on the discussion questions and on the post-meeting drafts of a white paper to summarize the workshop discussions. Several CPH-NEW researchers also submitted comments on the new NIOSH resource document, "The Essential Elements of Effective Workplace Programs and Policies for Improving Worker Health and Wellbeing."

Drs. Punnett and Cherniack subsequently represented CPH-NEW at the NIOSH Worklife Initiative meeting held in October, 2008, at the University of Iowa. Dr. Punnett presented a summary of the discussion and recommendations from the February working group on "Practice" represented in the WLI white paper, which has since been published [1].

In May of 2009, Drs. Cherniack, Lahiri, and Punnett participated in a workshop convened at NIH with the participation of NIOSH, CDC, and 5 institutes of NIH. The goal was to identify which research areas should be stimulated to advance knowledge and implementation of effective worksite health promotion. The CPH-NEW co-authors contributed to the workshop report to identify areas of overlap between occupational health and workplace health promotion, which represent potential opportunities for integration through programs and policies [2].

Aging, Work and Health Conference

In Year 4, CPH-NEW joined with the UConn Center on Aging to co-sponsor a major regional (New England) conference entitled, "Healthy Aging and Work." Held in Farmington, CT, with particular emphasis on Connecticut and Massachusetts, this meeting featured several legislators, the Director of NIOSH and the Deputy Director of the National Institute on Aging, and others as speakers (Appendix Core-6). The discussions addressed several key issues around workforce health and aging:

1. Adjusting to the national trend of rapidly increasing workforce age, particularly in the Northeast, with the largest increase in men and women 55 and older.
2. Understanding the individual and environmental factors that enhance high function and reduce the premature onset of chronic diseases
3. Developing evidence-based preventive policies and programs that promote healthy workplaces and sustain healthy aging at work

The forum was semi-public, with specific invitations extended to representatives from CT and MA congressional delegations; state commissions on aging and departments of labor and health; non-governmental organizations that address issues around aging and work; group health and worker's compensation insurance industries; organized labor; and regional employers, particularly those with innovative policies towards workforce health and older workforces. A total of 97 participants attended.

The goal was to provide an opportunity for dialogue between key legislators and their staffs, representatives of national research and policy institutions, and parties from the private and public sectors. The forum featured two panel discussions, one on federal research and policy, and the second on regional initiatives in the public and private sectors. There was scheduled time for less formal discussion and networking.

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Other Outreach and Dissemination

In June, 2008, several CPH-NEW researchers submitted comments to the National Committee for Quality Assurance, a non-profit organization dedicated to improving health care quality, which had published draft standards for worksite health promotion programs. These comments addressed organizational and sector specificity; the choices of outcome measures; and the value of engaging employees actively in program development in order to enhance both program reach across socioeconomic levels and long-term sustainability. One issue of the 'CPH News and Views' factsheet also summarized some of these key points.

A regular semi-annual joint research retreat provides an opportunity for exchange among students, research staff and faculty members from all three university campuses. These annual "Sturbridge Retreats" were held in January and May of each year. CPH-NEW investigators, including graduate students, have presented work in progress at each of these meetings for broader discussion and feedback. These meetings also provided a convenient opportunity to schedule center-wide retreats and meetings of the CDMTs.

Because of her role as PI of CPH-NEW, Dr. Punnett was invited to join the International Scientific Board of FINALE (Frame for INterventions for preserved work Ability: Long term Effect), a Danish research program (2008-11) at the National Research Centre for the Working Environment. FINALE consists of 6 interlinked research projects that address musculoskeletal health and disability prevention through health promotion and work organization, so there was direct overlap of interest areas. Dr. Punnett also presented by invitation at a number of other national and international institutions about the Center concepts, methods and findings.

Complementary Projects

Several complementary projects were developed during this grant period by Center personnel and Affiliates, some for conceptually related but independent activity and others arising directly out of CPH-NEW projects. While NIOSH resources were not expended directly on these projects, CPH-NEW shared study instruments, and in some cases Steering Committee members provided review on an in-kind basis. Three of these projects received external funding during Years 1-5 (see Appendix Core-7). By this means, the Center has been able to leverage NIOSH funding to increase our research scope, branching out into related areas including weight loss, the aging workforce, night shift work, and criminal justice. These additions to the NIOSH-funded Center offer additional confirmation of the value of CPH-NEW activities both in scope and in approach, as well as the access to workplaces which follows from a high degree of employer interest in and perceived value of the Center's work.

External and Internal Evaluation

In Year 4, the Center engaged external evaluators from the Center for Health Policy and Research at UMass Medical Center to review CPH-NEW infrastructure and research projects. The evaluation report (Appendix Core-3) identified a number of strengths. Suggestions for improvement focused especially on enhancing the effectiveness of the EAC and CDMTs. Other recommendations included clarification of over-arching themes that link all Center projects, introduction of new content areas of study, outreach beyond Massachusetts and Connecticut, and enhanced research staffing. Conditional on available resources, a majority of these recommendations were incorporated into the Center's renewal application for Years 6-10.

Internal evaluation occurs at the semi-annual all-employee meetings and research retreat. These meeting offer the opportunity to critically evaluate progress on the research projects,

team interactions, outreach activities and new opportunities. The weekly SC meetings serve to follow-up on issues identified at these meetings and opportunities to resolve problems.

Project Accounting

- Timely completion of project goals and sub-goals, including individual project aims, was achieved in Projects A, B, and D. The exception was the delay in site recruitment for Project B, but once that was resolved we progressed steadily with planned data collection. Obviously the dramatic downsizing at Pratt, mid-way through the project period, had serious consequences for cohort follow-up and essentially necessitated abandonment of the original study design. Fortunately the DOC sites have been very responsive and HITEC progress there is excellent, although lagging behind the original timeline.

- IRB reviews and approvals were all completed and maintained in a timely fashion.

- Project surveys, interventions, and economic evaluations have been carried out as planned, conditional on the issues above in Project B. Some analyses, such as economic evaluations at DOC, are now scheduled for the carry-forward period.

- Participation rates in individual projects varied markedly. Projects A and D offered financial compensation for surveys and direct observations, and the response rate was impressive. Project B did not offer such compensation and the response rate suffered, probably as a direct consequence.

- Productivity: Peer-reviewed articles and conference presentations have been generated from all four projects and from the core, developed through dialogue in the Steering Committee and joint writing efforts to document the emerging shared paradigms within the Center.

- A wide variety of outreach products have been generated, ranging from public website postings to progress reports designed for the project partners and customized newsletter articles for workers at participating sites.

- Qualitative evaluation of the extent and effectiveness of coordination within the mainstream public health community has been undertaken within Project C as well as in the Steering Committee. While ongoing, this has influenced the Center's strategy for future outreach, in that more effort is now shifting to dissemination to employers, who are typically in more of a position to undertake direct organizational change.

Cross-Project Lessons

All CPH-NEW projects seek to implement health-promoting worksite structural changes that can be replicated and maintained. The value of the different approaches is the opportunity to compare processes and results. Thus we intended originally to compare Research Projects A and B in terms of metrics such as effectiveness, cost-effectiveness, levels of participation, reception from individual employees, reception from company personnel responsible for implementation, etc. We anticipated that any differences might be attributable to differences in the study designs between the two projects.

However, it became evident over the course of the award period that macro-level factors are likely more important determinants of differences not only in results but also in the conduct of the research, such as availability of data for analysis. These contextual differences are numerous, including workforce demographics, private vs public sector, organizational evaluation imperatives, and history of labor-management relations.

For example, the nursing home workforce is about 90% female and very low socio-economic status, whereas both manufacturing and corrections are predominantly male and more highly compensated. Very few of the GHCC centers are unionized, whereas workers in the Connecticut DOC (and at Pratt) are union members. This is highly relevant in terms of creating participatory structures where workers have protected time and can engage fully without fear of reprisal. Union representation also affects salary levels and employee benefits, which were identified within all the focus groups as influencing people's health behaviors and ability to participate in any WP activities offered at their work sites.

At the same time, there are similarities between the two contexts, some not obvious at first glance. Both nursing homes and corrections facilities are custodial or human services settings. The work is high-risk, takes place over three shifts, and often involves involuntary overtime. Economic pressures severely impact program budgets. Turnover and under-staffing are chronic issues, both among the front-line workforce and also turnover of key managerial personnel which impacts the availability of program champions and overall program continuity. Obviously, with two research projects in three sectors, there is no power to evaluate the influence of these factors in any quantitative manner. Nonetheless, these observations represent new hypotheses and insights for future research directions. With the completion of data collection in Projects A and B, we intend to pursue cross-project analyses that will investigate the effects of workplace structure and environment on health outcomes through the use of instruments that were common to both projects.

Among the projects, there were also entirely different processes by which - and why - employers were recruited to participate in Projects A, B, and D. In particular, successful up-take of the R2P Toolkit components in other worksites further strengthen the observation that both internal and contextual factors are important determinants of organizational readiness for change and for specific interventions. These sites were first recruited by the Massachusetts Department of Public Health to participate in an employee wellness program, and subsequently volunteered to extend that effort to incorporating ergonomics and work organization issues. Thus the potential problems of recruiting and empowering a champion for employee health programming and providing employees with time or other resources to support program participation had already been addressed, at least in part.

Thus, despite differences that complicate interpretation of site and project-level comparisons, the lessons learned from our observations are imperative for workplace health promotion interventionists. It is clear that workplace interventions cannot be "one size fits all" and that a deep understanding of workplace demographics, organizational culture and labor management is necessary for an intervention to be effective. Furthermore, involving employees from all levels of the organization, from the very early stages on, is crucial in successful implementation.

The Center projects and Cross-Disciplinary Methods Teams (CDMTs) interacted in a number of ways to enhance learning and R2P learning. For example, the Implementation CDMT sought generalizable approaches to achieving integration of OHS and HP, focusing on the design and transactional process rather than assuming a single solution would fit all contexts.

Both ProCare and HITEC identified a need for strategies to engage managers as allies for the work of the employee teams. The development of the Research-to-Practice (R2P) Toolkit project and the actual design of the toolkit components is largely based on lessons learned from these field studies, where the success of this integrated approach has been shown to depend on line-level employees assuming an active role in the planning and design of workplace interventions and also in being able to advocate successfully for those interventions with the managers who hold budgetary authority.

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Thus CPH-NEW has developed an integrative and comprehensive approach to reduce workforce hazards and promote worker health, through identification of the links between workplace culture and personal high-risk behaviors and examination of effectiveness of designed workplace interventions. CPH-NEW has also met key translational and effectiveness research goals by developing targeted methods and accessible assessment instruments, and by proposing a multi-dimensional productivity/business case approach.

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1. Cherniack MG, Henning RA, Merchant JA, Punnett L, Sorensen G, Wagner G.: [2011] Statement on National WorkLife Priorities. *Amer J Industr Med* 54(1):10-20.

2. Sorensen G, Landsbergis P, Hammer L, et al.: [2011] Preventing Chronic Disease at the Workplace: A Workshop Report and Recommendations. *Amer J Public Health* [epub ahead of print] DOI: 10.2105/AJPH.2010.300075.

List of Appendices

Core-1   CPH-NEW Authorship Guidelines

Core-2   Conference Presentations

Core-3   External Evaluation of CPH-NEW, UMMC Center for Health Policy & Research

Core-4   CPH-NEW Research Affiliates program description

Core-5   List of CPH-NEW Research Affiliates

Core-6   Healthy, Aging and Work conference agenda

Core-7   Description of other research projects related to CPH-NEW

Core Publications

(NOTE: The Center Core does not have formal Aims, per se, but dissemination of WorkLife Initiative (WLI – now "Total Worker Health") core concepts and goals and information about the WLI consortium is part of the Center's mission.

Cherniack M, Punnett L: [2011] Implementing Programs and Policies for a Healthy Workforce. In: Occupational Health: Recognizing and Preventing Work Related Disease and Injury, 6th ed. (eds. BS Levy, DH Wegman, SL Baron, RK Sokas), Oxford University Press, Inc., chapter 38.
> *The chapter describes some core concepts of the the National Institute for Occupational Safety and Health (NIOSH) WorkLife Initiative (WLI) and places these in an historical context. Also addresses Aims 1 and 3 of Project B.*

Cherniack M, Henning R, Merchant JA, Punnett L, et al: [2011] Statement on National WorkLife Priorities. American Journal of Industrial Medicine 54(1):10-20.
> *Describes the National Institute for Occupational Safety and Health (NIOSH) WorkLife Initiative (WLI) and lays out the history behind its development as well as policy, research and practice recommendations.*

Cherniack M, Warren N, et al: [2009] Workplace interventions and changing patterns of cardiovascular disease. European Journal of Oncology e-pub (special issue).
> *Discusses the "psychosocial environment" approach to CVD, focusing on contribution of job control and other risk factors to social variations in CVD incidence. Two CPH-NEW study populations, correction officers and nursing home workers, are discussed in terms of exposures and risks. Also addresses aims 1-3 of Project C.*

Cherniack M, Lahiri S: [2010] Barriers to implementation of workplace health interventions: An economic perspective. Journal of Occupational and Environmental Medicine 52(9):934-42.
> *Identifies insurance-related, structural, and workplace cultural barriers to the implementation of effective preventive and upstream clinical interventions in the working age adult population. Also addresses Aim 3 of Project B.*

Faghri PD, Kotejoshyer R, et al: [2010] Assessment of a worksite health promotion readiness checklist. Journal of Occupational and Environmental Medicine 52(9):893-9.
> *Provides a tool for assessing the level of and need for health promotion programming for employers. Development of the tool was part of the overall center effort; it was first utilized at Project A sites and therefore also helped to address Aim 2 of that project.*

Henning RA, Warren N, et al: [2009] Workplace health promotion through participatory ergonomics: An integrated approach. Public Health Reports 124 (Suppl 1):26-35.
> *This article lays out a common approach for both Projects A and B to engage line-level employees in the planning and design of workplace interventions to benefit their health and safety. It combines ergonomics for workplace change with health promotion approaches through use of participatory ergonomics (PExHP). Also addresses Aim 3 of Project A and Aim 1 of Project B.*

Henning RA, Nobrega S, Flum M, Punnett L, CPH-NEW Research Team: [2009] Engaging workers in health promotion and health protection efforts: A participatory approach for innovation and sustainability at two worksites. In: Different perspectives on work changes, Proceedings of Second international workshop on work and intervention practices, (eds. PA Lapointe, J Pelletier), Les Presses de l'Université Laval, pp 199-208.
> *This article provides empirical evidence that the PExHP program described in the prior paper has feasibility and user acceptance in the field in long-term care facilities. Also addresses Aim 3 of Project A and Aim 1 of Project B.*

Obidoa C, Cherniack M, Reisine S: [2010] Survey Review: How does the SF-36 perform in healthy populations? A structured review of longitudinal studies. Journal of Social and Behavioral Health Sciences 1:1-18.
> *The researchers conducted a structured review of longitudinal studies that reported the use of SF-36 among people in their active working years (ages 18 to 65) to assess its stability for use in longitudinal studies. Also addresses Aim 2 of Project A and Aim 2 of Project B.*

Punnett L, Cherniack M, et al: [2009] A conceptual framework for the integration of workplace health promotion and occupational ergonomics programs. Public Health Reports 124 (Suppl 1):16-25.
> *Describes the scientific and public health rationale for the CPH-NEW approach and the NIOSH WorkLife Initiative (WLI). Utilizes data from ProCare (Project A) to illustrate some of these issues. Also addresses Aim 2 of Project A.*

Robertson M, et al: [2010] Workplace safety and health promotion through participatory ergonomics. Proceedings of the 10th International conference of Human Factors in Organizational Design and Management (ODAM), IEA Press.
> *A multidisciplinary team of researchers in the Center for the Promotion of Health in the New England Workplace (CPH-NEW) developed an evidence-based approach to address three recognized challenges to workplace programs designed to improve employee health: establishing employee ownership, integration with work organization, and sustainability.*

Sorensen G, Landsbergis P, Hammer L, et al.: [2011] Preventing Chronic Disease at the Workplace: A Workshop Report and Recommendations. *Amer J Public Health* [epub head of print] DOI: 10.2105/AJPH.2010.300075.
> *Drs. Cherniack, Lahiri, and Punnett participated in this workshop at NIH and contributed to this report to identify areas of overlap between occupational health and workplace health promotion, which represent potential opportunities for integration through programs and policies.*

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Core-1	CPHNEW Authorship Guidelines
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CPH-NEW Guidelines for Authorship and Preparation of Publications
Prepared by Laura Punnett and Martin Cherniack

(Last revised: July 19, 2010)

1. The investigators of this project affirm that it is in our mutual interest to produce as many publications as are appropriate to reflect the wide range of disciplines and topic areas under study. The principles and procedures described here are intended to facilitate inclusion of those multiple perspectives in the writing process through interpersonal and interdisciplinary collaboration. In addition, faculty members are particularly encouraged to mentor and support research assistants and other students to initiate and participate in the writing process.

   CPHNEW endorses and expects ethical conduct in data collection, analysis and writing of all center-sponsored research, including grant writing activities. All center personnel are expected to be familiar with good professional practice in this regard; see for example CSE 2006 and documents available from ORI (see references below).

   The procedures described here apply equally to all forms of publication, including: presentations at small, informal workshops and seminars; conference oral presentations and posters; book chapters and peer-reviewed journal articles.

2. The investigators agree that, in principle, multiple authorship is appropriate for every publication (conference abstract, proceedings, journal article, book) that describes the methods and/or reports data from this project. Author lists will end with "CPH-NEW Research Team" (examples of published articles with similar attributions are available from LP).

   At the same time, the project as a whole reserves the right to be flexible on the issue of multiple authors, especially for student theses, papers by junior faculty members, and those in fields where co-authorship is not widely accepted (e.g., Hollis 2001). Because different academic disciplines have particular conventions around co-authorship, the CPH-NEW teams will try to accommodate cross-disciplinary considerations wherever possible.

3. Each study group (Project or Cross-Disciplinary Methods Team) is encouraged to identify, as early in the process as feasible, each paper that it plans to generate as a group, as well as papers that individual members have a particular interest in writing, to allow time for appropriate collaboration and acknowledgment. Each writing group (whether a project, team, or ad-hoc group that crosses projects or teams) should identify its intended manuscripts

to the Steering Committee through the UML Center Administrator (Sandy Sun), or directly to either Co-Director (Laura Punnett or Martin Cherniack). The purpose of notification is to coordinate writing efforts among interested researchers as well as to maintain a full historical record of the group's work.

4. Procedure for obtaining collaboration: Every paper concept (and deadline, if a conference abstract) will be circulated to members of the appropriate project and/or team(s), with enough advance notice that those who wish to participate in drafting it may do so. Typically, the members of the relevant project will be listed by name as co-authors, assuming that they have "contributed substantially" to the design of that study component, or to the data collection, analysis and interpretation upon which the paper is based, or to the writing of that paper (CSE, 2006). In some cases, a topic is of interest to a group that crosses projects or teams, and then the teams involved may need to discuss who are the appropriate co-authors. It is strongly recommended that a written memorandum be created at this stage to document the planned topic, outlet, authors and author sequence.

The purposes of the memorandum can be served by submission and/or revisions to the CPH-NEW writing table, **which should always be sent through or copied to the Center Administrator**. Submissions to the writing table should include theses, major project papers from graduate students, **and any conference presentations that do not duplicate papers already listed in the table by the same author(s)**. The writing table will be reviewed on a monthly basis by the Steering Committee, or more often if needed or upon request of any investigator.

5. There are various principles that can guide decisions about the sequence of authorship on any given paper. Each writing group will need to discuss this issue at the beginning of the writing process. Possibilities (as discussed by Erlen et al., 1997) include:
    - designating the team leader as first author;
    - giving more weight to study design or writing or data analysis (as determined by those involved); or
    - in alphabetical order, with a footnote to indicate this.

6. There are a number of specific recommendations in the article by Erlen et al. (1997) that are well-reasoned but have not yet been discussed by the project members as a whole. Except where the project members involved agree to different guidelines, those recommendations will be expected to guide our decisions about authorship, responsibilities and accountability, resolution of disagreements, and when and how to make exceptions to these guidelines.

When and if there are disagreements about contributions and authorship, these will be resolved when possible within the project, usually by the Steering Committee, unless either of the Principal Investigators is a party to the disagreement. If an internal mediator cannot be agreed to by those involved, we will seek external assistance from the CPHNEW Advisory Board, the University of Mass. Lowell Ombudsperson, or other appropriate uninterested party.

7. In addition to their specific contributions to individual papers, the CPHNEW Co-Directors

and Project P.I.'s have the right to be listed by name on any paper to which they have contributed in the form of the administrative effort required to maintain the project in good standing with the funding agency. Typically this would mean being listed as the senior author (i.e., the last author named). Of course any Director P.I. is also free to refuse co-authorship if s/he feels that her/his contribution is too marginal to the specific paper.

8. All data, qualitative and quantitative, that are obtained through this project belong to the project and not to any individual affiliated with it. Individuals who work on the project, whether faculty, staff, students, or consultants, are not permitted to take data with them without express permission from the principal investigators and an explicit agreement regarding publication plans and co-authorship. **Anyone wishing to utilize a data file collected with CPH-NEW resources, whether an internal or external investigator, should make a written request or proposal to the Steering Committee, through the Center Administrator. This must be done on the front end, i.e., prior to conducting analyses, submitting conference abstracts or thesis proposals, or submitting grant proposals, etc.** Outside vendors or data collectors (internal to the study) should submit their requests for data usage **through** the PI.

Each project will have a single data coordinator (either the PI or a designee) who will maintain and edit the master project file **and maintain a log of datasets disseminated (names and dates)**. This will be used both to track use of the data and to ensure that all users have up-to-date copies of data files.

9. All project personnel are urged to keep the Center Administrator informed as to their whereabouts after leaving the project or the University. Many journals require signatures of all co-authors prior to publication, and failure to locate a co-author could result in having to remove that person's name from the author list. Students are particularly urged to maintain contact with CPH-NEW and with their advisors or mentors on the project, so that their contributions can be fully credited. (Similarly, when a manuscript is in preparation or under revision, lack of a timely response may necessitate that a potential co-author's name would be moved to the Acknowledgments section.

10. By contractual obligation to NIOSH, all publications <u>must</u> contain the following wording in the acknowledgments:

"This publication (journal, article, etc.) was supported by Grant Number 1 U19 OH008857 from the National Institute for Occupational Safety and Health. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of NIOSH."

The same wording should be used on the Acknowledgements slide in all presentations.

References

Council of Science Editors. White Paper on Promoting Integrity in Scientific Journal Publications, 2006. Accessed on April 2, 2008, at:

http://www.councilscienceeditors.org/editorial_policies/white_paper.cfm

Erlen JA, Siminoff LA, Sereika SM, Sutton LB. Multiple authorship: Issues and recommendations. Journal of Professional Nursing 1997; 13(4): 262-270.

Hollis A. Co-authorship and the output of academic economists. Labour Economics 2001; 8:503-530.

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http://ori.hhs.gov/education/products/niu_authorship/index.htm
See also other documents on Publication Practices and Responsible Authorship. Accessed on April 2, 2008, at:
http://ori.hhs.gov/education/products/rcr_authorship.shtml

I hereby affirm that I have read the CPH-NEW Guidelines for Authorship and Preparation of Publications in full, that I agree with all of the principles in it and that I will abide by the described procedures in both the letter and the spirit of the document.

_____   _____

(Researcher Signature)   (Date)

CPH-NEW: Administrative Core

Scientific Conference Presentations, 7/1/2006 - 6/30/2011

Presentations are listed in descending chronological order, by name of conference

American Occupational Health Conference, American College of Occupational and Environmental Medicine, Washington DC, 2011
- CPH-NEW: A systems approach to participatory ergonomics and health promotion

APHA Annual Meeting, 2010
- NIOSH WorkLife Initiative: Is it health promotion, health protection, neither, or both?

Karolinska Hospital, Huddinge SWEDEN, 2010
- Center for the Promotion of Health in the New England Workplace (CPH-NEW): A conceptual framework for combining participatory ergonomics methodology with workplace health promotion

Towards Better Work and Well-Being. Finnish Institute of Occupational Health, Helsinki, FI, 2010
- A conceptual framework for combining occupational ergonomics with workplace health promotion.

Current Initiatives to Integrate OHS and Workplace-based Chronic Disease Programs in New England, Farmington, CT, 2009
- Center for the Promotion of Health in the New England Workplace (CPH-NEW): An update on combining occupational ergonomics with workplace health promotion.

National Research Centre for the Working Environment, Copenhagen DK, 2009
- Center for the Promotion of Health in the New England Workplace (CPH-NEW): An overview.

California Commission on Health and Safety and Workers' Compensation roundtable, Oakland CA, 2008
- Workplace Wellness - How to address both occupational and lifestyle issues on the job.

Current initiatives to integrate OHS and workplace-based chronic disease programs in New England. Farmington, CT, 2008
- Center for the Promotion of Health in the New England Workplace (CPH-NEW): A conceptual framework for combining occupational ergonomics with workplace health promotion.

NIOSH Science Seminar, Atlanta GA, 2008
- The Center for the Promotion of Health in the New England Workplace and the NIOSH Healthier WorkLife Initiative.

The Institute of Medicine Committee on Personal Protective Equipment for Workplace Safety and Health Meeting, Washington, DC, 2008
- Cost-effectiveness studies: Making the business case for personal protective equipment across occupations.

Work, Stress, and Health, (APA-NIOSH-SOHP), 2008
CPH-NEW Symposium Papers:
- CPH-NEW: Evidence-based strategies for integrating OHS with Workplace Health Promotion.
- Evaluating management readiness.
- Integrating participatory ergonomics with health promotion in the workplace
- Worksite measurement of organizational readiness for a participatory ergonomics intervention.
- Site evaluations for participatory nursing home clinical staff wellness programs.
- Facilitating inclusion of job strain issues by public health professionals.

APHA Annual Meeting, 2007
- Evidence-based strategy for integrating occupational ergonomics with workplace health promotion: The Center for the Promotion of Health in the New England Workplace

From Both Sides of the Atlantic: Exploring the complexities of health promotion in the workplace. Harvard School of Public Health, 2007
- The scientific rationale for combining workplace health promotion with occupational ergonomics.

NORA Symposium, Midwest Center for Occupational Health and Safety, University of Minnesota, Minneapolis MN, 2007.
- Socioeconomic disparities in health and in occupational exposures: Relevance for workplace health promotion and protection programs.

NIOSH WorkLife Symposium: Protecting and promoting worker health, 2007
- Center for the Promotion of Health in the New England Workplace (CPH-NEW): An overview.
- CPH-NEW: Evidence-based strategies for integrating OHS with workplace health promotion.
- Adaptation of a participatory ergonomics framework for actively engaging workers in the design of health promotion programs. (Poster)
- Cost utility models for supporting prevention through new reimbursement methods: A framework.
- Economic evaluation of occupational health interventions: Results from macro and micro level studies.
- Participatory ergonomics as a model approach to health promotion.
- A worksite readiness checklist for participatory worksite ergonomics and health promotion programs.

NORA Symposium on Research to Practice, 2007
- Socioeconomic disparities in health and in occupational exposures: Relevance for workplace health promotion and protection programs.

October 20, 2010

Study of the Center for the Promotion of Health in the New England Workplace (CPH-NEW) Final Report

Prepared by:
The Center for Health Policy and Research
(CHPR)

Project Team
Center for Health Policy and Research
Linda Cabral, Senior Project Director
Laura Sefton, Research Coordinator
Christine Clements, Senior Advisor
Judy Savageau, Senior Advisor

Acknowledgements

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Executive Summary

Project Overview and Study Objectives

The Center for the Promotion of Health in the New England Workplace (CPH-NEW or the Center) is one of three national Centers of Excellence to Promote a Healthier Workforce funded through the WorkLife Initiative (WLI) of the National Institute for Occupational Safety and Health (NIOSH). CPH-NEW is led by investigators from the University of Massachusetts Lowell (UML), the University of Connecticut Health Center (UConn Health Center), and the University of Connecticut at Storrs (UConn Storrs). Several different projects have been established to achieve the Center's research goal. These on-going projects allow for various intervention approaches to promoting a heathier workforce to be explored and better understood in different settings.

The Center for Health Policy and Research (CHPR) at the University of Massachusetts Medical School was asked to assist CPH-NEW with conducting a self-study to assess the effectiveness of the CPH-NEW's structure, functionality and productivity, and to determine opportunities for change. This self-study will contribute to the CPH-NEW's final report to NIOSH for the current initiative, its subsequent proposal to NIOSH for a new funding cycle, and other potential proposals for future funding.

Study Methods

Using a semi-structured interview guide, CHPR conducted interviews with 15 CPH-NEW project investigators and staff during July and August 2010 to learn about their experiences with and perspectives on the Center's work. Interviews addressed domains of interest to the Center, including the administrative core, how projects are aligned to meet the research goal and objectives of the Center, and how the Center identifies new research and training opportunities. It also explored strengths/benefits, challenges/ drawbacks, lessons learned and opportunities for improvement in each domain. Our findings reflect the perspectives shared by respondents.

Study Findings

Strengths

Staff bring complementary and interdisciplinary expertise to the Center: When the opportunity arose to apply for the NIOSH grant in 2006, the academic partnership between the UML and UConn campuses had already been established. Building on that, CPH-NEW is led by two Principal Investigators whose complementary knowledge and personalities are seen as a strength of the Center. They work well together and this sets a positive tone for others.

In addition to the two PIs being seen as experts in their research fields, other project investigators bring various research expertise, such as occupational health, psychology, and ergonomics, to each project. Their diverse research interests allow multiple perspectives to be incorporated into each project.

Research projects are well aligned with the goal and objectives of CPH-NEW: All respondents felt that the four research projects funded as part of the current initiative are very well aligned with the goal and objectives of CPH-NEW. The use of a participatory approach and cross-disciplinary project teams are consistent across projects.

CPH-NEW's administrative core keeps Center staff informed about and involved in Center projects and activities: The Steering Committee's weekly meetings keep staff informed about the Center's goals, projects, and timelines. They also provide an opportunity for staff to get objective feedback about their projects and address potential problems early on. Respondents praised the sense of community that exists within CPH-NEW.

The Advisory Committee provides project staff with a group of experts outside of CPH-NEW who can inform the Center about appropriate presentation venues, potential collaborators, and relevant trends in the field. Members can be consulted to provide objective feedback or other project-specific assistance when needed.

Four Cross Project Methods teams were created to provide guidance to project teams, as well as share information and common measurement tools across teams. Respondents recognized the value of having teams that can provide a common expertise to inform their research.

Opportunities for Improvement

The Center faces certain challenges to its operation and projects. Respondents provided many suggestions to aid in resolving these issues.

Find ways to streamline administrative processes between the three campuses: Each campus has different administrative and accounting procedures which makes sharing data and funds challenging.

Better utilize Advisory Committee and Cross Project Methods Teams: Respondents indicated a desire to make better use of both committees' expertise to benefit the Center's projects. Expanding Advisory Committee membership to different sectors would enhance the Center's knowledge and expertise, potentially allowing expansion into other work sectors. Having more opportunities for in-person Advisory Committee meetings and asking for assistance with reviewing research papers or the upcoming NIOSH renewal application would increase members' involvement with the Center.

Regarding the Cross Projects Methods teams, the challenge most noted by respondents was a lack of activity. Clarifying the role and leadership of each team, assigning deliverables due to the Steering Committee, and becoming more task-oriented were suggestions for future improvements.

Expand outreach to improve the Center's visibility: Outreach activities would connect more people with the work of the Center. By increasing the number and type of activities where the Center's expertise and research findings could be disseminated, CPH-NEW could build awareness of its capacity. Activities suggested by respondents included developing

workshops and seminars, convening national meetings, and broadening involvement with other University departments, policymaking groups and trade organizations.

Recommendations

The following are recommendations that CPH-NEW can consider as they move forward with their planning NIOSH renewal submission.

1) Seek funding opportunities outside of NIOSH
2) Clarify how the four projects fit together, how they work together, and why they benefit from being part of CPH-NEW
3) Maximize the sharing of expertise across the campuses
4) Find new ways to engage employers and employees
5) Expand work to other New England states
6) Host conferences and forums geared at employers and expand online learning capabilities to share best practices on employee health
7) Engage employees in all phases of the projects
8) Showcase the multi-university collaboration model to other university departments
9) Identify new research areas

Conclusion

CPH-NEW is serving a unique niche in the academic world. It is a good model for multi-university collaboration, proving it can be done successfully. Its four research projects have taken different approaches to better understand how to integrate occupational health and health promotion in the workplace and much has been learned with these projects. However, in moving forward, CPH-NEW needs to clearly identify and articulate a common theme across all its projects. A standard approach should be applied so that it is clear to everyone how all the projects fit together and why it makes sense for them to be under the CPH-NEW 'center' umbrella.

CPH-NEW is well positioned to meet the challenges of a new NIOSH WLI grant opportunity by building upon what has been learned in the last five years since the Center's founding. Actively seeking out areas outside of the NIOSH WLI grant for development would also contribute positively to CPH-NEW's growth. By building upon its areas of strength – it's leadership, expertise, and commitment to enhancing employee health and wellness via a participatory approach - the Center will be able to meet new challenges.

I.   Project Overview and Study Objectives

The Center for the Promotion of Health in the New England Workplace (CPH-NEW or the Center) is one of three national Centers of Excellence to Promote a Healthier Workforce funded through the WorkLife Initiative (WLI) of the National Institute for Occupational Safety and Health (NIOSH). CPH-NEW is led by investigators from the University of Massachusetts Lowell (UML), the University of Connecticut Health Center (UConn Health Center), and the University of Connecticut at Storrs (UConn Storrs). Investigators bring together diverse research interests and backgrounds including worksite health promotion, occupational medicine, occupational health and safety, ergonomics, occupational and industrial psychology, and economics.

The research goal of CPH-NEW is to evaluate the feasibility, effectiveness, and economic benefits of integrating occupational health and safety with health promotion interventions to improve employee health.

The stated research objectives of CPH-NEW are to:
*   Assess the value of integrating health protection and health promotion in the workplace for enhancing health benefits and/or cost effectiveness;
*   Integrate two core public health disciplines (Occupational Health and Safety and Health Promotion) by linking primary prevention to the workplace, and the workplace to primary prevention; and
*   Evaluate opportunities and obstacles in U.S. workplaces, especially those that serve as study sites, and in the traditional public health infrastructure.

Four projects have been established to achieve the Center's research goal. These on-going projects allow for different intervention approaches to be explored and better understood in various settings.

*   Promoting Caregivers Physical & Mental Health via Transdisciplinary Intervention (ProCare) - Evaluates employee health outcomes and cost effectiveness of a safe resident handling (SRH) or "no-lift" program in a long term care corporation in the eastern U.S. Compares self-administered survey and workers compensation data before and after the implementation of mechanical lifts, and compare whether additional benefits are seen with the presence of traditional or participatory health promotion programs.

*   Health Improvement Through Training and Employee Control (HITEC) - Compares traditional ("top-down") workplace health promotion programs with "worker-led" or "bottom-up" programs developed with employee participation. The key goal is the assessment of shorter-term changes in the individual and environment, such as endurance and body composition, physical loading on the musculoskeletal system,

and stress in and out of the workplace. Corrections and manufacturing are two sectors where this project is implemented.

- Stress@Work Education, Translation, Communication and Dissemination Project - Focused on the public sector, *Stress@Work* builds upon statewide Heart Disease and Stroke Prevention plans developed by Departments of Health in Massachusetts and Connecticut to educate health professionals about job strain as a risk factor for cardiovascular disease and intervention strategies to reduce workplace stressors.

- An R2P (Research-to-Practice) Toolkit for Establishing Sustainable Workplace Health Protection/Promotion Programs - Translates participatory intervention methods in Projects A, B, and C into instruments and protocols to be used by employers and workplace health practitioners. An initial toolkit will be tested and revised for acceptability, usability, and short-term effectiveness in four pilot sites in MA and CT.

The Center for Health Policy and Research (CHPR) at the University of Massachusetts Medical School was asked to assist CPH-NEW with conducting a self-study to assess the effectiveness of the CPH-NEW's structure, functionality and productivity, and to determine opportunities for change. This self-study will contribute to the CPH-NEW's final report to NIOSH for the current initiative, its subsequent proposal to NIOSH for a new funding cycle, and other potential proposals for future funding. The questions for this self-study are:

1) How does the administrative core of CPH-NEW support the Center's research goal and objectives?
2) How are CPH-NEW's research projects identified, prioritized, staffed and implemented?
3) How are other CPH-NEW activities (e.g., education and training) identified, prioritized, staffed and implemented?

II. Study Methods

To provide an overview of the Center and its four projects, CHPR reviewed various background documents from CPH-NEW. These included NIOSH annual progress reports, articles published by Center investigators, and a Center fact sheet. These materials provided helpful context in developing an interview guide and this report.

In July 2010, Center leadership identified 15 CPH-NEW project investigators and staff to be interviewed to learn about their experiences with and perspectives on the Center's work. The Center's leadership sent an email to the identified staff to introduce the CHPR evaluation team and let them know they would be contacted by a member of this team to schedule an interview. Using contact information provided by Center leadership staff, in-

person or telephone interviews were scheduled by a member of the CHPR evaluation team. Interviews were conducted in July and August 2010.

The CHPR evaluation team created a semi-structured interview guide with input from Center leadership staff. It was piloted with one staff person and slight modifications were made. The guide included questions that addressed the domains of interest to the Center, including the administrative core, how projects are aligned to meet the research goal and objectives of the Center, and how the Center identifies new research and training opportunities. We explored strengths/benefits, challenges/drawbacks, lessons learned and opportunities for improvement in each domain. See Attachment A for a copy of the final interview guide. While the guide provided a common framework for each interview, due to the different roles each respondent had within the Center, modifications were made as necessary in order to fully explore the respondent's relationship with CPH-NEW.

CHPR staff spent one day at the UML campus conducting five in-person interviews and one day at the UConn Health Center conducting four in-person interviews. One additional in-person interview was conducted in Sturbridge, MA. The remaining five interviews were conducted via telephone. Each interview lasted approximately 60 minutes. Two members of the CHPR evaluation team conducted each interview, one facilitating the discussion and the other taking detailed notes. Both members of the interview team reviewed all interview notes and worked together to agree on interview themes and conclusions. Analysis of the interview data was assisted by use of the qualitative data analysis tool Atlas.ti©.

Table 1 indicates the methodology of how interviews were conducted (in person or via telephone), what campus each interviewee affiliates with, and whether the interviewee was a Steering Committee member. The Steering Committee is an internal body that provides direction and support to CPH-NEW.

Table 1: Summary of CPH-NEW Center Staff Interviewed

	All Respondents (n=15)
Method	
Telephone	5 (33%)
In Person	10 (67%)
Campus	
UMass Lowell	6 (40%)
UConn Health Center	5 (33%)
UConn Storrs	3 (20%)
Other	1 (7%)
Steering Committee Member	
Yes	11 (73%)

A preliminary report was provided to CPH-NEW leadership for feedback. Additionally, CPHR made an oral presentation of our findings to multiple CPH-NEW staff as part of a

regular Steering Committee meeting. Feedback has been incorporated into this final report.

III.   Study Findings

Upon our analysis of the information collected, and in collaboration with our CPH-NEW partners, the most useful way to present the findings emerged as follows:

- A. Meeting the Research Goal and Objectives of CPH-NEW
- B. CPH-NEW Administrative Core
- C. Hosting University Relationships
- D. Identifying New Opportunities
- E. Respondent Viewpoints on Center Renewal Planning

Throughout the presentation of our findings, we have included quotes to provide additional insight to themes within each domain, and these are italicized.

A.   Meeting the Research Goal and Objectives of CPH-NEW

In this section, we describe how the projects undertaken by CPH-NEW align with the research goal and objectives of the Center and identify factors that facilitate and challenge this alignment.

i.   Overall perceptions of CPH-NEW project alignment with NIOSH Work-Life Initiative (WLI) goals

Respondents felt strongly that each of the research projects align well with the goal and objectives of CPH-NEW. The funding opportunity from NIOSH gave CPH-NEW flexibility as to how to explore the integration of occupational health and health promotion. CPH-NEW has recruited several workplaces, including nursing homes, corrections, and manufacturing facilities, to serve as control and intervention sites.

These projects have explored the integration of occupational health and health promotion at the intervention sites in two ways:
1) Projects have a participatory approach, involving workers from all levels in decision-making teams.
2) Cross-disciplinary teams are working on each project, bringing different approaches to achieving the anticipated integration.

Design teams at the various sites recruited by CPH-NEW have developed different interventions. Some respondents we interviewed believe that the participatory approach employed at the sites is itself an important intervention that needs to be recognized.

ii. Factors that facilitate alignment of CPH-NEW projects with WLI goals

Prior to the NIOSH award to CPH-NEW in 2006, an academic connection existed between the three campuses largely due to their overlapping research interests. Therefore, when the opportunity arose to apply for the NIOSH grant, the partnership between UML and UConn was seen as a natural alliance. Trust and good working relationships had already been established.

Respondents feel that several factors contribute to the overall success of CPH-NEW. A strong theme cited is the interdisciplinary and complementary expertise of staff from all three campuses. People have various and diverse research interests which allow multiple perspectives to be incorporated into each project. The consensus is that the three-campus collaboration offers a strength that would not otherwise be available independently.

> *The integration of health promotion and workplace safety using two campuses is ideal. Any one of us alone couldn't pull it off.*

The strengths most often cited for each campus include:

- UML – Ergonomics; intervention development; and statistics
- UConn Health Center – Ergonomics and clinical expertise
- UConn Storrs – Industrial and organizational psychology

Some respondents feel that having universities in two different New England states positions CPH-NEW as a regional center instead of a state-specific center. The findings generated from its projects have more applicability to a larger geographic area. Working with two different state Departments of Public Health is seen as an asset.

During the interviews, the two Center Principal Investigators (PIs) were frequently mentioned as leaders in their respective fields. Their knowledge and personalities are seen as complementary. They work well together and this sets a positive tone and example for the rest of the staff. Respondents felt that CPH-NEW staff get along and value working with each other.

> *It's intellectually stimulating and rewarding to work with a multi-disciplinary team.*

Three out of the four current projects have a home campus, which means that the PI and most of the staff working on the project are located at the same University. This model seems to work well particularly because of the ease in coordinating work with staff nearby instead of at a different physical location.

Many respondents value staying connected with the weekly Steering Committee conference calls which are the primary mechanism for coordination among the projects and campuses. In addition to the weekly Steering Committee conference calls, many respondents cited the bi-annual in-person meetings in Sturbridge, MA, as a valuable

opportunity to connect with others and identify linkages and new opportunities.

iii. Factors that challenge CPH-NEW project alignment with NIOSH WLI goals

While respondents felt that CPH-NEW was a pioneer in the field, they also cited project specific challenges that affect how well integration of health promotion and workplace safety can be achieved.

- More CPH-NEW investigators have expertise in occupational health than in health promotion. There exists a healthy tension between the two arenas, highlighting the value of the cross-disciplinary team approach where members can learn from each other.

  People need to buy into the idea that they cannot afford to only participate in their niche. We could lose ground on integration.

- Finding common data collection instruments to use across projects is a challenge cited by some respondents. Instruments with valid measures that assess the integration level of occupational health and health promotion do not exist.

  Combining the overall themes of worker involvement and health promotion with occupational health hasn't completely succeeded yet. We're still using separate measures, so they're running parallel to each other.

- Some workplaces do not see a natural integration of these two fields. Health promotion is seen as being within an individual's decision-making realm, whereas occupation health is seen more in alignment with a company's responsibilities and interests. Getting senior management buy-in on supporting the work of the intervention teams has been challenging at times. System and policy change is difficult.

  When we go out and educate, it's a hard sell. Workplace wellness people don't interact with risk management people. The two disciplines of occupational health and health promotion are on two different tracks.

- Many of the interventions that the worksite participatory groups would like to develop require some funding to implement. The worksite groups have received limited financial support from their own institutions.

- Due to the current economic climate, some intervention sites have closed, whereas others have lost staff that were on the teams. This turnover has resulted in longer than expected timeframes for developing interventions.

iv. Structural challenges to center operations

In addition to the strengths cited above, respondents were also asked about structural challenges faced in achieving the goals and objectives of the Center. The most commonly

mentioned challenge was the distance between the two universities. Many recognized the importance of coordinating work across campuses and projects. Despite the weekly Steering Committee conference calls, this weekly one-hour time slot is not enough to fully share what is being learned across all projects and identify potential cross-project collaborations. Even staff who are on the same campus but not in the same building identify the lack of ease in communicating with their colleagues as a difficulty.

> *Distance is part of the terrain. Because of the distance, people have had to work harder; they're more process-oriented.*

Another major challenge respondents discussed is having to deal with different administrative structures at each of the three campuses. Each campus has its own accounting procedures and administrative rules. Since UML is the primary NIOSH contractor, subcontracts are in place to each UConn campus. The transfer of funds is noted as an administratively burdensome and time-consuming process.

> *The campuses process things differently. We're waiting for the award to come in because we need to create payments for UConn as a sub-contractor. It's frustrating for them to wait. They understand the process but it's hard for them.*

Sharing data files is also noted as a challenge. Several attempts have been made to create a mechanism that would allow for staff at each of the campuses to share data. However, due to firewalls and other data security measures at each campus, no system has been developed that allows equal access across campuses.

UML and UConn Storrs are on a 9-month academic calendar while UConn Health Center is on a 12-month calendar. Staff at UConn Health Center note this as a particular challenge as staff at the other two campuses are not as readily available during the summer months.

Some expressed concern that staff are spread thin on multiple projects. Staff are often funded only on a small part on multiple projects. Thus, their ability to devote significant time to any one project is limited.

> *Lack of time, money, and staff are barriers [to projects succeeding].*

Lastly, staff at the UConn Health Center envy the soft money more readily available at UML and UConn Storrs which allows them more flexibility in how they spend their time on projects.

B. CPH-NEW Administrative Core

In this section, we describe the components of CPH-NEW's administrative core which includes the Steering Committee, Advisory Committee and Cross Project Methods Teams. Strengths and opportunities for improvement are identified for each domain.

i. Steering Committee

Role

The Steering Committee is the primary mechanism for keeping Center staff informed about the Center's progress on goals and the status of the individual projects, identifying research and collaboration opportunities, planning for potential presentation arenas, and future planning for projects and new opportunities. Members consist of Center administration, project investigators, and other staff from all three campuses. Committee members meet for one hour on a weekly basis in person or via conference call. Members receive an agenda prior to each meeting, which is used to guide the weekly discussion. Administrative tasks, such as development of Center policies and troubleshooting of issues, are also discussed at these meetings.

Strengths

The weekly scheduled meetings keep leadership and staff focused on and connected to the Center's goal, projects, and timelines. A sense of community within the center is created as well as a connectedness among the campuses. The ability to attend via conference call is critical in order to maximize participation by committee members.

The meetings provide an opportunity for investigators to get objective feedback from people not on their projects and to address potential problems in a timely manner. While the committee consists of people with different roles and expertise, dialogue is open and collegial, with time allowed for everyone to speak or offer an opinion. The Center Director is praised for her ability to lead effective meetings and keep the discussions focused. The agenda assists in keeping the meeting organized and within the hour timeframe.

> *They [the Steering Committee conference calls] are essential. The agenda pulls people together. You can't get too far astray because you're always coming back to the Thursday phone call.*

Opportunities for Improvement

Although the Steering Committee meetings are praised for following an agenda and keeping to its scheduled time, some respondents felt that the hour could be used more effectively. Meeting discussion should focus on sharing ideas or issues that are well formulated. Respondents feel that bringing ideas that are not well developed is not the best use of Steering Committee time. Less time should be spent on project updates. This information could be emailed in summary form in advance of each meeting. Steering committee time is best spent sharing beneficial cross-project information, troubleshooting issues, and discussing new research and collaboration opportunities.

Some feel that expanding the length of the meetings by 30-60 minutes would allow for a fuller discussion of the many potential project and research ideas generated in the Center. However, this is balanced by others' concern of spending too much time in meetings. In addition, the ability of Steering Committee members to follow up in a timely manner on

action items identified in the meetings is cited by some respondents as problematic. More meeting time should be spent reviewing action item statuses.

Since not everyone affiliated with CPH-NEW is on the Steering Committee, more could be done to keep non-members better informed about the committee's activities. While project representatives attend meetings, they may not be communicating information back to other team members who are not on the Steering Committee. Email or a website could facilitate sharing of meeting minutes or other important documentation.

> *Non-members might not see the bigger picture. Initially, I didn't have a sense of the bigger picture, but once I was educated on it, I understood why people were doing what they were doing. We need a vehicle to regularly educate non-members about the vision and where we are going.*

ii. Advisory Committee

Role

The Advisory Committee is a diverse group of people outside of CPH-NEW whose role is to give feedback and guidance on the Center's activities, provide ideas about potential research collaborations and outreach activities, and assist in guiding the Center's future direction. Membership includes people from other universities, research institutes, insurance companies, and government. The Advisory Committee is charged with meeting with Center leadership and staff two times each year in Sturbridge, MA, and keeping in touch with Center staff throughout the year via email and phone.

Strengths

The Advisory Committee members' diverse expertise and interest areas bring additional resources to the Center. As their expertise relates directly to the research topics of the Center, committee members' experience in various fields is utilized to inform the Center about appropriate presentation forums, and collaborators, as well as identify experts and trends in the field. Because committee members are not involved in the day-to-day work of the Center, they are better able to provide the objective feedback needed to guide the Center's direction and activities.

> *It's an impressive list of folks to call on.*

When held, the bi-annual formal meetings are seen as a useful, interactive forum for this feedback and are productive in this regard. The meetings also provide an opportunity for Center staff to engage with committee members in a social setting.

Some Advisory Committee members have formed research collaborations with the Center. Project members consider them a valuable resource and are comfortable reaching out to them whenever there is a need.

Opportunities for Improvement

We received mixed responses as to the frequency with which Advisory Committee meetings are held. While the intent is to hold bi-annual meetings, due to the limited time Advisory Committee members have to devote to CPH-NEW work, these meetings do not always occur.

Some respondents feel that the Advisory Committee is not used in the most beneficial way and that its current format is not useful. Because Advisory Committee members are not involved in the day-to-day management of projects, when meetings are held, too much time is used to bring them up to speed on the status of each project. Time could be better spent troubleshooting and brainstorming about new connections and opportunities.

> *In theory, they give us feedback on things we're working on. I'm not sure how effectively we use them.*

As attendance at the bi-annual meetings is low, the perception is that some committee members do not have enough time or interest to be involved with the Center. Some members may have agreed to serve on the committee out of a sense of obligation rather than a true interest in the work. Assuring that the appropriate people have been invited to participate and that they will be available to attend the formal meetings may increase attendance. Utilizing them more regularly outside of formal meetings, such as asking for assistance with reviewing research papers or the upcoming NIOSH renewal application, may increase their knowledge of and connection to the Center.

Expanding committee membership to different sectors, such as manufacturing, would bring in people with varied expertise that could be used to expand the Center's knowledge and create relationships that could aid in recruiting study sites and collaborators. Creating specific topic-oriented subcommittees comprised of members with relevant skills and interests could focus members' energies towards tasks that interest them.

> *We may need to identify each member's strengths, figure out why a member is being selected, then put them on a subcommittee where the member can actively contribute to what is being discussed.*

Some committee members are also in a grant-seeking environment. Because committee members' expertise may be in the same research areas as the Center, some members might be writing grants that are competitive with the Center's grant applications. This may affect members' ability or desire to assist the Center with its activities. Recognizing potential conflicts of interest is something to be aware of.

iii.   Cross Project Methods Teams

Role

The Cross Project Methods Teams were developed as a way to share information, provide guidance, and create common measurement methods across the Center's

projects. The teams are in various forms of existence, with some being more solidified than others.

The teams originally conceived were:
- Economic analysis
- Health promotion
- Qualitative research methods (now known as the Intervention or "I-Team")
- Survey measures and biometrics.

Strengths

Respondents recognized the value of having teams with shared expertise to help evaluate methods or data that could be shared across the projects. The ability of these methods teams to respond to a Center need is a positive aspect. In particular, the I-Team evolved out of the Qualitative Research Methods team and remained active for a time.

The I-Team has been the most active cross project methods team at CPH-NEW. I-Team meetings, when held, are considered by team members to be useful opportunities to share information and tools and to solve common problems across projects.

> *One could say they exist more on paper, but that's not a valid criticism. It creates a mechanism for people to talk across teams [projects].*

Opportunities for Improvement

The challenge cited most often with the cross project methods teams is the lack of activity within the groups. Most teams are currently not meeting regularly. This seems to be due to a lack of time on the part of members to participate in the team's work and a lack of clear leadership on the teams.

Respondents indicated that better communication from the method teams that they are not involved with would be useful to their projects. Though intended to provide benefits across multiple projects, some project teams may seek the input from one person on a methods teams instead of seeking feedback from the team as a whole. Thus, individual project staff may be in contact with only one person on the methods team.

If the need arose to revive these teams, suggestions include:
- Clarify the role and leadership for each team;
- Assign deliverables that would be due to the Steering Committee; and
- Become more task-oriented, rather than 'meeting for meeting's sake.'

> *If we could get the (cross-disciplinary) team structure going, we wouldn't have to reinvent the wheel every time a new project comes along.*

C.   Hosting University Relationships

To assess the Center's relationship with the two universities, respondents were asked about the support provided to the Center by their respective universities and what impact the Center has had on the universities.

University Support

With regard to what the universities provide to CPH-NEW, physical space for the Center was the most recognized resource provided. Other resources include videoconferencing capability, scanners, faxes, computers, and lab access. Staff at UML appreciate the Provost's financial support for graduate student work with the Center and hope that it will continue. The other two campuses do not receive the same amount of graduate student support.

> *[UML Respondent] Our Provost provides funding for graduate student assistantships (4-5 students, 18 hours a week). it's a huge benefit to attract students to work on projects at no cost. Students are masters/PhD level and collect and analyze data that can be used for their own theses.*

Respondents noted several areas where more university support is needed. One is additional salary support for faculty at UConn Health Center, which currently relies heavily on investigators generating grant support to cover their salaries. UConn Health Center respondents also desired more opportunities for junior faculty to be involved in developing projects. Opportunities for junior faculty without a long history of funding tend to be limited. Having smaller projects in the Center that junior faculty could lead would aid in faculty retention efforts and increase the academic attractiveness of the university.

Staff feel that recognition from their universities has been limited. More publicity and higher visibility within their universities is desired. Respondents feel that a grant this substantial in amount and prestige justifies more recognition than has been provided to date.

> *We're well-received but not well-rewarded.*

Impact on Universities

Respondents feel that CPH-NEW has had a positive impact on their respective universities. They indicate that CPH-NEW has generated positive publicity on behalf of their universities. The Center's website provides information to outside entities who then contact the Center for more information or to express interest in partnering with the Center.

The Center is also seen as a multidisciplinary and multi-institutional center. It provides opportunities for faculty with varied expertise to work together and learn from each other. This is in alignment with the mission of the two universities.

We're always looking to engage other university faculty for a small percentage of time. It's a multi-disciplinary center. There are economists, nursing faculty, health promotion staff, and psychologists. It's a good place to get involved with people from other disciplines.

Another benefit the Center provides to the university is research and educational opportunities for undergraduate and graduate students. Students assist with the collection and analysis of data, and are able to use some data for their own research purposes. These students spread the word to others, creating a new set of research assistants as previous students move on in their education/careers.

CPH-NEW has also developed positive connections with businesses and labor through its projects, which is unique among university-based centers. By engaging employers to participate in research activities, CPH-NEW has created collaborations with the business community which reflects well on their universities.

When asked if CPH-NEW has had any negative impact on the universities, most respondents did not believe so. Some proposed that the Center could do more for the university. One suggestion was to work with other academic departments to add more health promotion and workplace safety components to the universities' curriculum. Another suggestion was to offer the Center's expertise in workplace safety and health promotion to their own university workplaces.

D. Identifying New Opportunities

Interviewees were asked how new research and collaboration opportunities are identified. It became clear after several interviews that there is no formal process for this but that many methods are used to identify opportunities as detailed below. Once leads are identified, they are typically discussed at Steering Committee meetings to determine whether and how to move forward with the opportunity.

The identification of possible funding opportunities includes:
- UML utilizes a search engine to identify funding opportunities and distributes this information to the academic community;
- Center staff regularly monitor NIOSH or Occupational Safety and Health Administration (OSHA) Requests for Applications (RFAs); and
- Steering or Advisory Committee members bring ideas to committee meetings.

Opportunities for collaborations include:
- Investigators leverage community connections, including connections with Advisory Committee members;
- Relationships are created between Center staff and other university faculty, departments, or campuses; and
- Connections are made at national meetings or local presentations.

Some respondents desire a clearer understanding of the types of research and collaboration opportunities that should be pursued. Several staff indicated that the Center leadership or Steering Committee were primarily responsible for identifying these opportunities. Additional awareness by all staff of the role they could play in generating new business is needed. Respondents noted that having a person who is dedicated to identifying and researching funding opportunities as well as assisting with the grant writing process would be highly advantageous, as staff often do not have time to search for or write grants.

> There's no help to sift through opportunities or do something more targeted (i.e., grant searching). It falls on those of us who are busy. We have ideas we haven't been able to pursue because we have no one available.

E. Respondent Viewpoints on Center Renewal Planning

CPH-NEW staff will soon be preparing an application for a new round of competitive NIOSH funding. Additionally, CPH-NEW is interested in exploring new opportunities for projects and funding outside of NIOSH. Respondents were asked what components of CPH-NEW they would like to see stay the same or change, and what new components might be added in efforts to seek new funding and collaborations. Respondents offered a range of insights within the following thematic areas.

i. Components that should be carried forward in the renewal grant

Project Focus: Respondents felt that CPH-NEW projects should continue to work with long-term care settings and corrections. Even though working with these sectors has been challenging, respondents feel that continuing with them is worthwhile because of the investment already made to developing relationships with them and because of the potential to learn more from these typically under-researched sectors. Additionally, a longitudinal examination of data would be possible if CPH-NEW continues to work with these sectors.

Center Administration/Staffing: The core people in the Center do an excellent job of communicating with the university and keeping Center staff informed about the projects and other activities. The right people have been brought in, including scientists who facilitate publication of papers. Additionally, the mix of faculty and students is a benefit because of the differing levels of research experience available to each project. It also offers the opportunity for faculty to mentor more junior faculty and graduate students.

The Steering Committee: The existing Steering Committee structure works well. Weekly meetings are valuable and needed, allowing for communication across the Center.

ii. Components that should be improved or added

<u>Project Site Involvement:</u> Respondents made the following suggestions regarding the involvement of project work sites:
- For certain projects, shift the focus towards participatory sites and away from the control sites.
- Expand involvement with middle and upper management as target of interventions and organizational outcomes.

<u>Cross Projects Methods Teams:</u> Respondents stated that these teams are important to have so that new projects can take advantage of knowledge gained by other projects. However, a clearer charge should be put forth for these teams and their role reconfigured.

<u>Advisory Committee:</u> The Advisory Committee's face-to-face meetings are important for the Center and the committee. However, more regular interaction with Advisory Committee members is necessary to maximize their usefulness.

> *We need better use of the advisory committee-more frequent, targeted conversations.*

<u>Outreach:</u> Respondents recognized the value of the existing expertise within CHP-NEW and had the following suggestions for ways to expand the Center's visibility.

- Develop workshops, webinars and consulting capacity to provide health promotion and/or ergonomics information to workplaces;
- Convene national meetings with experts and scientists in the field of health promotion and workplace safety;
- Broaden involvement with policymaking groups and trade associations to expand reach within New England; and
- Extend geographic focus within New England.

<u>Pilot Projects:</u> All four of CHP-NEW's projects are well funded initiatives. Some respondents suggested that CPH-NEW should find opportunities for smaller pilot projects.

> *We should do more pilot projects. Some could be student projects. There could be seed funding to demonstrate something that could be a larger project. If it works well, there could be an R01 application.*

<u>Expertise:</u> Respondents suggested adding the following types of expertise to strengthen the work already being done by CPH-NEW:
- Additional Health Promotion and Ergonomics expertise;
- More senior faculty at UML; and
- A benefit design specialist who can advise companies on how to better integrate health promotion activities in the workplace.

IV.   Discussion and Recommendations

In this section, we provide our assessment of the strengths and limitations of the evaluation conducted by CHPR. Additionally, we reflect on how the information collected for this study can be used to respond to the original study questions. Lastly, we offer our recommendations for CPH-NEW to consider as they move forward with their NIOSH renewal application.

<u>Strengths and limitations of the evaluation</u>
The interview guide and process benefitted from having core CPH-NEW staff involved in its development and piloting. This involvement resulted in a more streamlined interview guide that captured what was most important for CPH-NEW's self study.

CHPR was able to conduct two-thirds of the interviews in-person. This allowed CHPR staff to gain additional insight as to how CPH-NEW staff work together and the environment in which they operate.

As with any project, a few limitations should be noted. CHPR was not able to interview all CPH-NEW faculty, staff, nor Steering and Advisory Committee members. We were provided with a representative sample of participants to interview. While the sampling of these folks from different areas provided an opportunity to gain very useful information, these insights are potentially limited in our ability to generalize findings across all of CPH-NEW. The staff interviewed were people who were generally very involved in the Center's work. Had we interviewed staff with more minimal involvement with CPH-NEW, we might have heard additional perspectives. In particular, additional interviews with Advisory Committee members would have been helpful.

<u>Reflection on original study questions</u>

1) *How does the administrative core of CPH-NEW support the Center's research goal and objectives?*
The administrative core of CPH-NEW provides the necessary foundation for the Center's projects. The leadership provided by the Center's PIs guides the work of the Center. The Steering Committee is a good vehicle for communication across all campuses. Meeting every week is key to the Committee's effectiveness. However, more needs to be done in order to ensure that CPH-NEW faculty and staff who are not on the Steering Committee are aware of the Committee's work. A re-evaluation of structure and purpose of the Advisory Committee and Cross Project Methods teams is suggested, as these teams currently are not realizing their potential.

2) *How are CPH-NEW's research projects identified, prioritized, staffed and implemented?*
3) *How are other CPH-NEW activities (e.g., education and training) identified, prioritized, staffed and implemented?*

These two study questions are answered jointly since there is significant overlap between them. CPH-NEW currently has four projects underway that serve to provide different approaches to integrating occupational health and health promotion. These projects are all funded by the NIOSH grant. CPH-NEW has no projects outside of those currently funded by NIOSH. There exist various informal mechanisms by which faculty and staff identify potential new projects or funding opportunities, including:

- Leveraging relationships with Advisory Committee members, other academic departments, and other universities; and
- Staying abreast of funding opportunities being issued by NIOSH, OSHA or other federal agencies.

Both project and funding ideas are brought to Steering Committee for discussion and consideration. CPH-NEW senior investigators, in particular, are seen as responsible for spearheading these efforts. Little is being done by CPH-NEW to expand its work beyond the NIOSH-funded projects. There is limited staffing capacity to devote to grant searching, grant writing, and business development. Faculty and staff are assigned to multiple projects and being able to carve out time for non-project related work is difficult. Recommendations on how CPH-NEW can expand its portfolio of business, as well as recommendations on other areas, is provided below.

Recommendations
In this section, CHPR provides an "outsider" perspective on areas that CPH-NEW could consider as it plans for its future development and, in particular, its NIOSH re-application. We also raise some questions for CPH-NEW to consider. CHPR recognizes that CPH-NEW staff have a sphere of control that only goes so far. A distinction is made for recommendations that need cooperation from CPH-NEW's hosting universities in order to move forward.

1) Seek funding opportunities outside of NIOSH - CPH-NEW has been reliant solely on NIOSH funding. There is limited staff capacity to seek out new opportunities. CPH-NEW would benefit from having a person partially funded to find and develop grant applications. Additionally, the Center should consider expansion into consulting services. The expertise that exists within the Center is marketable to private industries. Developing this consulting capacity would require start-up funds, perhaps from the University, as well as hiring staff who are accustomed to working for the private sector. A focus away from research and towards customer service, timeliness, and responsiveness would be necessary for this consulting capacity to be successful. *[University support needed]*

2) Clarify how the four projects fit together, how they work together, and why they benefit from being part of CPH-NEW – Consider whether the existing projects are working too independently and don't fit well into a 'center' structure. What are the overarching themes in the design and implementation of CPH-NEW's projects that fit with a 'center' philosophy?

3) <u>Maximize the sharing of expertise across the campuses</u> - The Center should look for ways, in addition to the Cross Projects Methods teams, to connect people with similar interests across projects. One mechanism for doing so would be developing a way for all campuses to share data effectively.

4) <u>Find new ways to engage employers and employees</u> – Look for opportunities to introduce or expand projects where it's clear what the benefits are for the employer as well as the employee. Not every employee is interested in health promotion, so how does CPH-NEW identify the ones that are and develop projects that engage those most likely to be potentially impacted by virtue of their personal interest in health promotion and prevention opportunities? The Center should examine how it could partner with or offer services for Employee Assistance Programs (EAPs). This employer-sponsored service may have insights into subgroups of employees which should be targeted for intervention and study. Lastly, consider adding employers to the Advisory Board or developing a separate committee comprised of employers and employees to offer input on project ideas and future planning to CPH-NEW.

5) <u>Expand work to other New England states</u> – CPH-NEW promotes itself as a regional center but is only doing work in two New England states. Connecting with the Departments of Public Health in the other New England states or via state Councils for Occupational Health and Safety (COSH) are potential vehicles for expanding work in other states.

6) <u>Host conferences and forums geared at employers and expand online learning capabilities to share best practices on employee health</u> – This would promote CPH-NEW as a leader in the field of employee/occupational health, thereby marketing its capacity to new stakeholders. It could also be a way to engage new work sites in research activities. *[University support needed]*

7) <u>Engage employees in all phases of the projects</u> – CPH-NEW employs a participatory approach in its projects by involving employees in intervention development. The Center could take this approach to the next level by further engaging employees in all phases of a project including:
   - Identifying research questions;
   - Developing data collection tools;
   - Analyzing results; and
   - Publishing and presenting findings.

There will be challenges to this level of employee engagement, particularly with employees spending paid time on activities outside of their core work responsibilities. CPH-NEW will need to work with employees to creatively identify how these challenges can be overcome.

8) <u>Showcase the multi-university collaboration model to other university departments</u> – CPH-NEW can educate other academic departments within their respective universities on how to establish a cross-university center. Can CPH-NEW faculty facilitate introductions among other faculty at UML, UConn Health Center and UConn Storrs? *[University support needed]*

9) <u>Identify new research areas</u> – Topics that have generated national interest and attention in recent years include:
   - Aging of the workforce;
   - Workers with chronic and multiple medical conditions; and
   - Workers who are commuting to multiple sites and/or telecommuting, therefore lacking a workplace identity.

The current workforce not only has a different complement of employees, but the settings in which they work have changed dramatically over the past decade. Beginning work in these areas, and with these groups of employees that are now more prevalent than ever before, could involve smaller, pilot projects that might eventually lead to a larger body of work. *[University support needed]*

V.   Conclusions

CPH-NEW is serving a unique niche in the academic world. It is a good model for multi-university collaboration, proving it can be done successfully. CPH-NEW is still a relatively new research center. Its four research projects have taken different approaches to better understanding how to integrate occupational health and health promotion in the workplace and much has been learned with these projects. However, in moving forward, CPH-NEW needs to clearly identify and articulate a common theme across all its projects. A standard approach should be applied so that it is clear to everyone how all the projects fit together and why it makes sense for them to be under the CPH-NEW 'center' umbrella.

The Center's projects have focused on a few workplace sectors, including correctional health, nursing homes and manufacturing. There exist multiple opportunities to expand the work it is currently doing either within these sectors or into new sectors. To simply continue with the status quo, rather than engage the uniqueness of the current workforce and workplace settings, would limit CPH-NEW's ability to grow as an organization.

CPH-NEW is well positioned to meet the challenges of a new NIOSH WLI grant opportunity by building upon what has been learned in the last five years since the Center's founding. Actively seeking out areas outside of the NIOSH WLI grant for development would also contribute positively to CPH-NEW's growth. By building upon its areas of strength – it's leadership, expertise and commitment to enhancing employee health and wellness via a participatory approach - the Center will be able to meet new challenges.

Attachment A. Interview Guide

Introduction

Thank you for agreeing to talk to us about your role at CPH-NEW and helping us to learn more about how the Center is doing its work. The information that we are collecting for this evaluation is part of a self study that aims to better understand the effectiveness of the Center's structure, functionality and productivity, and to determine opportunities for change.

We have a series of questions that we would like to ask you, which should take about one hour. Everything you share with us is confidential; that is nothing will be shared with CPH-NEW leadership that can be tied back to you. In our final report, we will be presenting themes from across all interviews that we are conducting. We may use some direct quotes in our report as these often help illustrate findings – we will only use quotes in a way that cannot identify the respondent.

Do you agree to the confidentiality we are providing?

Do you have any questions before we begin?

Overview and Projects

I'd like to begin by learning about your role at the Center and the projects you have worked on.

1) As TITLE, what are your overall responsibilities at the Center?
   a. What research projects have you led/participated in?
   b. What have been your responsibilities on these projects?
   c. How much of your time is funded by CPH-NEW?

2) How would you describe the alignment of each project you have worked on with the Center's research goal and objectives?

3) How have the projects you've worked on successfully combined and integrated health promotion and occupational health and safety interventions?
   a. What have been the challenges?
   b. What have been the lessons learned?

4) In what ways did the interventions address both changes in work and changes in individual behavior?

Administrative

Thank you for what you've shared so far. The next set of questions is about your Center's administrative structure.

5) We understand that the two universities had collaborated on work-site health and safety issues prior to NIOSH funding and formation of the Center.
   a. What strengths have the universities brought to forming and operating the Center, either separately or together?

    b. What challenges have the universities brought to forming and operating the Center?

6) What kind of support does your University provide to the CPH-NEW?
    a. Are there areas where more University support is needed?

7) What impact has the Center had on your University?
    a. Faculty new hires, new programs, students, certificate programs, etc?
    b. Has there been any negative impact? If so, please describe.
    c. What more could the Center offer to your University?

8) How would you describe the role of the Steering Committee to the Center's functioning?
    a. Has the role changed over time?
    b. What does the SC do well?
    c. What areas could the SC develop/improve?

9) How would you describe the role of the Advisory Committee?
    a. Has the role changed over time?
    b. What does the AC do well?
    c. What areas could the AC develop/improve?

10) How would you describe the role of the cross project methods teams?
    a. Which team(s) do you affiliate with?
    b. Has the role of these teams changed over time?
    c. What do these teams do well?
    d. What areas could the teams develop/improve?
    e. How is learning from across teams facilitated?

11) How are projects and Center planning coordinated between the two campuses?
    a. How do staff from both campuses work together?
    b. What are the advantages of having two campuses?
    c. What are the challenges of having two campuses? How can these challenges be addressed?

New Research and Training Opportunities

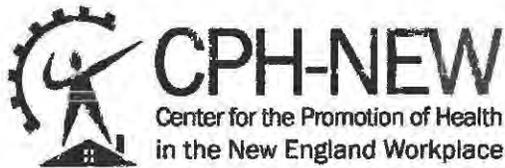This last set of questions is about research and training opportunities.

12) How are new research funding and collaboration opportunities identified?
    a. Suggestions for improving this process

13) What other activities might CHP-NEW engage in that would promote its research goal and objectives?

14) Thinking about a possible new phase of NIOSH funding,

      a. What current components would you like to see stay the same?

      b. What current components would you like to see changed?

      c. What additional components should be added?

Conclusion

Thank you very much for all that you have shared with us today. It has been very helpful.

15) Do you have anything else that you'd like to share with us about the Center, the projects, your role or anything else you would like to add?

CPH-NEW
Center for the Promotion of Health
in the New England Workplace

UMASS

UNIVERSITY OF CONNECTICUT

The **Center for the Promotion of Health in the New England Workplace (CPH-NEW)** is a Working Life Center of Excellence sponsored by the National Institute for Occupational Safety and Health (NIOSH). As described on the Center's webpage, http://www.uml.edu/centers/CPH-NEW/, the main goal of the Center is the integration of workplace health promotion (WHP) with occupational health and safety programs. Initial research has focused on ergonomics, psycho-social strain and work organization for primary and secondary prevention of musculoskeletal, cardiovascular, and mental health problems. The Center places a strong emphasis on worker involvement in program design and implementation. Another feature of the Center's work is the development of translation of best practices for healthy workplace implementation.

CPH-NEW Research Affiliates

CPH-NEW welcomes the affiliation of researchers and professionals whose interests are consistent with the overall mission of CPH-NEW.

Research Affiliates are professionals who have both interest and potential to contribute to the mission of CPH-NEW, whether or not they are associated with UCHC, UConn, or UML. Potential collaboration may take the form of research grant-writing, participation in already funded projects, co-authorship with CPH-NEW investigators, or contributions to the educational and outreach activities. Affiliate status, once agreed to by both parties, will continue as long as there is active engagement in any relevant activity.

Examples of possible benefits to Research Affiliates:

- Opportunities to develop professional relationships that may result in future collaborations
- Inclusion in special workshops, retreats, intramural events, etc.
- Access to the CPH-NEW internal website, including posted literature, program materials, and summary data
- Support for grant development and submission
- Opportunities for engaging graduate and post-doctoral students
- Work and meeting space with access to computers.
- Access to laboratory equipment, space, and technical assistance

CPH-NEW expectations of Research Affiliates:

- Willingness to consider reasonable requests for participation in research and outreach activities consistent with the CPH-NEW mission (e.g., review manuscripts or grant applications in process, assist with relevant student training, circulate relevant reprints and other materials, etc.).
- Provision of updates to the CPH-NEW 'writing table' for manuscripts, conferences and presentations that have involved CPH-NEW resources or personnel.
- Periodic presentations of work in progress (if geographically feasible).
- Use of CPH-NEW tools, instruments, or other materials will be acknowledged where appropriate in writing.
- In the case of grant-writing where CPH-NEW is named, appropriate acknowledgement of CPH-NEW; for any such funded projects, informing the CPH-NEW Steering Committee of ongoing project status by providing copies of progress reports, annual reports, and renewal applications provided to outside funding agencies.

Application process:

Those interested in Research Affiliate status are invited to express their areas of interest and/or ideas for collaboration in writing and to provide a full CV to the CPH-NEW Steering Committee (address below).

Following approval by the Steering Committee, Affiliates will be asked to sign the CPH-NEW Authorship Agreement. A copy of this document may be obtained in advance if desired.

Contact information:

Ms. Sandy Sun
CPH-NEW Administrator
Univ. of Mass. Lowell
1 University Avenue
Lowell, MA 01854 USA
Tel: +1-978-934-3269
Sandy_Sun@uml.edu

List of CPH-NEW Research Affiliates (2011)

Member	Position, Organization	Area of Expertise
Sean Collins, ScD	Associate Professor & Chair, Department of Physical Therapy, Univ. of Mass. Lowell	Disability assessment and management; psychosocial strain
Victoria Vaughan Dickson, PhD, CRNP	Assistant Professor & Brookdale Leadership in Aging Fellow, College of Nursing, New York University	Cardiac self-care in the aging workforce
Valerie Duffy, PhD, RD	Professor, Department of Allied Health Sciences, University of Connecticut (Storrs)	Assessing dietary intake; promoting healthy and enjoyable eating, especially in the underserved
George A. Kuchel, MD, FRCPC	Professor of Medicine; Citicorp Chair in Geriatrics & Gerontology; Director, UConn Center on Aging; Chief, Division of Geriatric Medicine, Univ. of Conn. Health Center	Function and outcomes in older adults, mechanisms leading to disability, co-morbidity, design of effective interventions
Anthony LaMontagne, PhD	Acting Director & Associate Professor, McCaughey Centre for the Promotion of Mental Health & Community Wellbeing, University of Melbourne, Australia	Occupational stress: epidemiology and translation for primary prevention
Paul Landsbergis, PhD	Associate Professor, SUNY Downstate Medical University	Socio-economic disparities in health; Occup. epidemiology
Stephenie C. Lemon, PhD	Associate Professor, Div. of Preventive and Behavioral Medicine, Univ. of Mass. Medical School; Community Engagement Section, UMass Center for Clinical and Translational Science (CTSA)	Worksite obesity reduction programs using policies, physical environment, access and availability and behavioral interventions
Darlene (Dee) O'Connor, Ph.D.	Director of Strategic Alliances, JEN Associates, Inc. (Cambridge, MA) & Associate Professor, Department of Family Medicine & Community Health, Univ. Mass. Medical School	Disability and long-term care; the relationship between work, health promotion, and long-term support needs
Michelle Robertson, PhD	Center for Behavioral Science, Liberty Mutual Research Institute for Safety	Participatory ergonomics
Deborah Shelton, PhD, RN	Professor of Nursing; Director, Research & Evaluation - Correctional Managed Health Care; University of Connecticut (Storrs)	Correctional health; mental health; community-based participatory research
Richard Stevens, MD	Professor, University of Connecticut Health Center	Shift work and breast cancer; environmental design
Robert L Trestman, PhD, MD	Executive Director, Correctional Managed Health Care; Professor of Medicine and Psychiatry, University of Connecticut Health Center	Occupational health and safety and workplace health promotion in correctional health

Healthy Aging and Work:
A regional forum on the changing demography of the New England workforce, research needs and workplace and public policies
June 7, 2010

Agenda

7:30 AM - 8:15 AM	Registration and Continental Breakfast
8:15 AM - 8:30 AM	Welcome Remarks - Dr. Cato Laurencin and Dr. Martin Cherniack Convener - Dr. David Wegman
8:30 AM - 9:30 AM	Panel 1: National Research and Policy on Aging and Work - Dr. John Howard, Director, National Institute for Occupational Health and Safety - Dr. Marie Bernard, Deputy Director, National Institute on Aging - Congressman Joseph Courtney
9:30 AM -10:00 AM	Open Discussion
10:00 AM -10:30 AM	Morning Break
10:30 AM -11:30 AM	Panel 2: Regional Issues around Work and Aging - Dr. Jewel Mullen, Director, Bureau of Community Health Access and Promotion, Massachusetts Department of Public Health - Julia Evans Starr, Executive Director, CT Commission on Aging - Mary Kay Browne, Senior Project Director, Office of Program Development, University of Massachusetts Medical School - Nancy Snyder, President and CEO, Commonwealth Corporation - Representative Chris Donovan, Speaker of the Connecticut House of Representatives
11:30 AM -12:00 PM	Open Discussion
12:00 PM -12:30 PM	Summary and Formal Adjournment
12:30 PM -1:30 PM	Reception and Light Lunch

Complementary projects related to CPH-NEW, 2006-11
(in chronological order)

"Characteristics of effective job health and safety committees"
NIOSH (1R21 OH009092-01A1): Tim Morse
Award period: 4/1/08 - 3/31/11
Goals: Health and Safety Committees (HSCs) are worker-management committees that are intended to reduce work-related injuries and illnesses; they are mandated in CT for all companies with 25 or more employees. This study was designed to understand better the characteristics of HSCs, such as membership, activities, and communication, that make them more or less effective.

"Aging, musculoskeletal disorders and work capacity"
NIOSH (1 OH008929): Martin Cherniack, Nicholas Warren
Award period: 9/1/08 - 7/31/13
Goals: To examine longitudinally the predictors of maintenance of work ability as workers age, in 6 industrial worksites, to answer the questions: How do aging, work and non-work exposures, in combination and individually, affect health? Is there an interaction with gender (in light of gender differences in physical capacity, workplace demands, work-family balance, etc.)? Can we identify subjects whose risk profile signals accelerated deterioration and future disability?

"Incentivized weight loss program for workers at high risk for Type II diabetes"
(Spin-off from Project A)
APTR/ CDC (S 1444): Pouran Faghri
Award period: 9/30/09 -3/30/11
Goals: To compare an incentivized weight loss program with a non-incentivized (but otherwise identical) program on weight loss, health self efficacy, program adherence, and program satisfaction, among nursing home employees who were overweight or obese.

"Department of Corrections dissemination project"
(Spin-off from Project B)
NIOSH (Contract # 254-2010-M-35834): Robert Henning
Award period: 8/15/10 - 11/30/11
Goals: To conduct interviews with key management and union leaders and focus groups with corrections staff, to identify salient stress issues among corrections staff and a comprehensive set of communication pathways for use by NIOSH in future dissemination of informational materials on stress management for corrections staff.

"Predictors of functional limitations related to musculoskeletal pain in nursing home clinical staff"
(Spin-off from Project A)
Harvard School of Public Health pilot project grant program: Gabriela Kernan, Laura Punnett
Award period: 9/1/2011 - 6/30/2012
Goals: Analyze survey data from nursing home workers to identify covariates or predictors of functional limitations among those with back or other musculoskeletal pain.

"Ergonomic training program for nursing home employees"
(Spin-off from Project A)
OSHA, Susan Harwood Training Grant: Marian Flum, Laura Punnett
Award period: 10/1/2011 – 9/30/2014
Goals: To build long term health and safety capacity and provide ergonomics training to limited-English (Spanish) and low -literacy nursing home workers, with both worker training and a train-the-trainer program.

"Comprehensive health programs to address physical activity, nutrition, and tobacco use in the workplace"
(Spin-off from Projects C and D)
CDC (subcontract from Viridian Health Management): Tim Morse, Martin Cherniack
Award period: 10/1/2011 – 9/30/2013
Goals: Develop and implement a workplace health protection and promotion intervention program to create working environments which promote and support positive work organization, and health opportunities for employees and their family members to reduce their lifestyle risk related to physical activity, nutrition, and tobacco use. Recruit 7 cohorts (clusters) of 10-15 employers each of varying sizes, by geographic region, to constitute a national network, for separate and combined evaluation.

"Obesity/overweight and the role of working conditions in lower income workers - a qualitative, participatory investigation"
(Spin-off from Project C)
UMass Medical School CCTS: Nicky Champagne, Suzanne Nobrega, Laura Punnett
Award period: 10/1/2011 – 9/30/2014
Goals: Qualitative investigation of factors in the workplaces that are perceived by low-income workers to contribute to their weight gain or difficulty losing weight. Conduct additional focus groups, a series of community meetings for feedback/discussion of focus group findings, and extensive dissemination activities.

Project A: Promoting Mental and Physical Health of Caregivers through

Transdisciplinary Intervention (ProCare)

Grant Number 1U19 OH008857

Grant period: July 1, 2006, to June 30, 2011

Report Date: November 20, 2011

PI: Laura Punnett, Sc.D.

Department of Work Environment

School of Health and Environment

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List of Terms and Abbreviations:

BCR: Benefits to cost ratio

BMI: Body mass index

C.V.:   Coefficient of variation

FTE: Full-time equivalent

GHCC: Genesis Healthcare Corporation

HP: Health Promotion

HWT: Health and Wellness Team(s)

JCQ: Job Content Questionnaire

LBI: Low back injury

MSD: Musculoskeletal disorder

NLP: No-Lift Program

NOC: Not otherwise classified

OSH: Occupational safety and health

PATH: Postures, Activities, Tools and Handling

PCS: Physical Health Subscale

PHP: Participatory health promotion

PWI: Physical workload index

ROI: Return on investment

SF-12:   Short-Form 12 (survey of health-related quality of life)

SRHP: Safe Resident Handling Program

WC: Workers compensation

WHP: Workplace health promotion

WLI: WorkLife Initiative (at NIOSH – now called "Total Worker Health")

WP: Wellness program

WRCL: Worksite Readiness Check List

3DSSPP: Three-Dimensional Static Strength Prediction Program

Job titles:

CNA =   Certified Nursing Assistant

GNA(S) =   Gerontological Nursing Assistant (Specialist)

LPN =   Licensed Practical Nurse

NA =   Nursing Aide

RN =   Registered Nurse

States: MA=Massachusetts, MD=Maryland, ME=Maine, RI=Rhode Island

Survey occasions:

F0 = baseline
F1 = 3 months after baseline
F2 = 12 months after baseline
F3 = 24 months after baseline
F4 = 36 months after baseline

Study centers: I1-3 = Intervention sites; C1-3 = control sites

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Abstract

Low back injuries (LBI) and other musculoskeletal disorders (MSDs) have been related to physical work demands, the aging of the workforce, and personal risk factors. Patient lifting devices have been shown to reduce risk of LBI among healthcare personnel, but the potential role of non-occupational factors such as obesity or cigarette smoking has not been examined. Health promotion (HP) programs aimed at addressing these traditional cardiovascular risk factors might enhance the reduction in LBI rates. These same health behaviors might also be affected directly by work organization characteristics.

This intervention study took place within a large chain of nursing home facilities belonging to a single corporation, which had already committed substantial resources to implementing a safe resident handling program (SRHP) in all of its skilled nursing facilities. An optional "Wellness" program (WP) had also been adopted in some facilities. In three other centers without prior WP programming, we implemented a participatory health promotion (PHP) program, defined broadly to include work organization issues. Thus three arms of the study permitted evaluation of: the SRHP (before/after); the WP plus SRHP, versus SRHP alone; and the PHP plus SRHP, versus SRHP alone. The before/after comparison of the SRHP had been planned with an internal time-varying control group, but the program was implemented more quickly than anticipated and only one pre-implementation survey occasion was possible after the award period began. Mixed methods (quantitative and qualitative) were used.

Key outcomes of interest were:

1. Ergonomic exposures, including both physical (biomechanical) and psychosocial

2. Health endpoints, health behaviors and attitudes: LBI and MSD rates; cardiovascular risk factors such as obesity, smoking, and hypertension; mental health; health self-efficacy

3. Work outcomes, such as annual average turnover and intention to turnover

4. Program cost-effectiveness

The SRHP resulted in increased use of resident handling equipment by nursing assistants, less work time in resident handling activities, and fewer non-neutral back and shoulder postures. Biomechanical modeling confirmed an overall decrease in physical workload. Workers' compensation claims decreased post- vs pre-intervention with an overall benefit-to-cost ratio of 1.68; savings were higher where there was also a WP, despite no direct evidence of effectiveness. There was high variability among centers in these outcomes.

In 18 nursing homes surveyed by questionnaire, adverse working conditions were associated with cigarette smoking, leisure-time exercise, obesity, sleep quality, and intention to leave the current job. In contrast, health behaviors such as body mass index, self-rated health, and exercise habits showed no benefit (center averages) from WP. Disappointingly, high-fat diet and current smoking (but also former smoking) were more prevalent in centers with well-developed WP programs. Intention to leave work was slightly lower and decision latitude, coworker and supervisor support were slightly higher in those centers. Direct care workers and managers had very different perceptions of opportunities for staff input and decision-making, emphasizing the importance of participatory programs to ensure that workers' experiences and needs are addressed adequately.

Workers in the three selected centers with the participatory wellness team process reported higher employee engagement than in three control centers and more attention to organizational issues such as teamwork, respect, communication and locus of decision-making.

Significant Findings

The Safe Resident Handling Program (SRHP) appears to have reduced the total time spent by nursing aides in performing manual resident handling tasks, the frequency of lift use, and the time in non-neutral body postures during those tasks. There was a parallel corporate-wide reduction in the rate of workers' compensation claims and the costs of those claims, both overall and specifically for injuries related to resident handling. The effect on frequency of self-reported musculoskeletal symptoms was equivocal. However, recent physical assault by resident or resident family or visitors was robustly associated with the prevalence of musculoskeletal pain. Workplace violence, especially when long-term, was particularly associated with those pain features that are most likely to jeopardize workers' ability to continue working.

The prevalence of health behavior risks (current smoking, obesity, lack of leisure exercise) increased linearly with the number of work organizational stressors such as low decision latitude, low co-worker support, lifting heavy loads, regular night work, and recent physical assault by a resident.

The company-sponsored health promotion ("Wellness") programs did not appear to have had any measurable (positive) effect at the group level on standard personal health indicators such as smoking, aerobic exercise, weight loss, or diet. While some individuals might have benefited, any benefit was too small to be observed for the entire workforce in a given center.

The results of the economic analyses are partially consistent with these findings of health benefit. The cost-effectiveness estimates were favorable for SRHP return on investment, although there was considerable inter-facility variability in net costs. Centers with WP activities had higher cost-effectiveness, despite the lack of measurable health benefits, suggesting the mechanism of general work climate rather than specific health behaviors. Turnover cost was a very important determinant of the intervention net costs for the employer. This suggests that the company would benefit greatly if interventions such as OHS and WP were implemented in such a way as to enhance employee retention.

Other workplace conditions such as decision latitude and social support were shown to have important effects on employee health and health behaviors. The participatory team process seeks to improve decision latitude and social support at least indirectly, by engaging workers in concrete actions to improve their work environments. The process is slow and challenging, both to workers and sometimes to investigators as well, but real improvements have been achieved already in each of the three participating centers.

Translation of Findings

Employers in the long-term healthcare sector should implement safe patient or resident handling programs in order to reduce rates and costs of low back injuries (LBI) and other musculoskeletal disorders (MSDs). An effective program will entail more than equipment purchase; on-going attention to employee training, device maintenance and replacement, battery re-charging, sling laundering, and other program features are essential to ensure success in practice. Education of patients, residents, and resident family members should also be incorporated.

Employers in long-term care should address assault of workers proactively as an occupational safety problem, rather than as merely a matter of individual behavior by residents or their visitors.

Workplace health promotion programs should implement primary prevention measures to reduce the root sources of job stress and ensure that working conditions are not an obstacle to healthy behaviors of employees. MSDs, cardiovascular disease and mental health generate

high disability and associated costs, so even a modest preventive effect would have great public health significance.

Employers should seek ways to increase positive, collaborative communication between CNAs and supervising nurses. Quality of communication between direct care providers and nursing supervisors is important for CNA job satisfaction and intent to remain employed.

To ensure effective workplace employee health programs, employers should seek worker input regarding their needs, constraints, and health values and should guarantee opportunities for worker involvement in program design and priority-setting without fear of reprisal.

Outcomes/Impact

Potential outcomes:
Worker health (musculoskeletal symptoms, obesity, smoking, etc.) as well as intention to stay at work, could be improved by reducing work organizational stressors such as low decision latitude, low co-worker support, lifting heavy loads, regular night work, and recent physical assault by a resident.

Intermediate outcomes:
Incoporating effective participatory mechanisms into employee health programs increased employee engagement and was reflected in improved social support at work.

End outcomes:
The reduction in manual resident handling seems to have reduced the need for nursing assistants to work in stressful body postures. The postural analyses showed an increase in neutral trunk posture while resident handling and decreases in the more severely flexed, bent, and twisted postures after 36 months. Also, an increase in time spent with the arms lower than 60 degrees was observed. Neutral postures, such as those observed following the SRHP, minimize loading on the body, including the lumbar spine and shoulders. Nursing assistants were also observed lifting loads less then 10 pounds more frequently and loads greater than 50 pounds less frequently. A pre-existing biomechanical model of physical workload was modified to incorporate ergonomic observational data for nurses and nursing assistants. Three years following the intervention, the physical workload decreased for nurses and, more dramatically, for nursing assistants.

In the participatory intervention, the health and wellness teams have all advanced in their ability to develop and implement programs, as well as to assess the strengths and weaknesses of their own program. Centers overcame initial reticence about presenting proposals to management and have taken more initiative and ownership of their programs. This growth in confidence resulted from overcoming obstacles and gaining support from staff. Tools developed to plan projects and develop proposals have had a positive impact on this process. Team members have been creative in choice of projects and in problem-solving. They are now willing to take on "big" issues that cause psychosocial strain, such as lack of teamwork and incivility.

The results of the economic analyses indicate favorable estimates for SRHP return on investment, although there was considerable inter-facility variability in net costs. The results suggested that the combination of SRHP and WHP had a much higher cost-effectiveness than the SRHP program alone, potentially making a strong business case from the employer's perspective for implementing both types of programs. However, this finding is discordant with the lack of direct evidence of health benefits of WHP activities.

PROJECT A SECTION II: Scientific Report

Background

Musculoskeletal disorders (MSDs), especially low back injuries (LBI), generate high disability costs and have been related to physical work demands, the aging of the workforce, and personal risk factors such as obesity and cigarette smoking. There is some evidence that the high rate of LBI among clinical personnel in the healthcare sector can be reduced by use of patient lifting devices. Potential effect modification by non-occupational LBI correlates such as obesity, cigarette smoking, or depression has rarely been examined, nor have other potential benefits, such as increased belief in one's own capacity to make improvements in health (health self-efficacy), which further enhances other healthy behaviors. Health promotion (HP) programs that are successful in addressing traditional cardiovascular risk factors (exercise, diet, smoking) and mental health could enhance the reduction in LBI rates to the extent that these factors contribute to risk among exposed personnel. The combination of workplace ergonomics and HP programs might also have more effect on health behaviors and beliefs than either type of program alone, but this has also not yet been examined.

Healthcare is the largest sector in the U.S. economy, accounting for over 3% of the total U.S. labor force with almost 11 million employees [1]. Employment in the health care sector is increasing by more than twice the rate for all industries. Leading job growth occupations (1996-2006) include registered nurses; nursing aides, orderlies, assistants; and home health aides [2].

According to data from the Bureau of Labor Statistics (BLS) for 2009, the incidence rate of non-fatal occupational injuries and illnesses for nursing and residential care facilities was 8.4 per 100 full-time workers for total recordable cases; the rate for cases involving days away from work, job transfer, or restriction was 5.0/100 [3]. In contrast, the rate for construction workers was 4.3/100 for total recordable cases and 2.3/100 for cases involving days away from work, job transfer, or restriction. Nursing aides, orderlies, and attendants ranked second for occupations with the most injuries and illnesses that required days away from work [4]. Overexertion accounted for 48% of the injuries and illnesses among nurses, orderlies and attendants, compared to 17% among construction workers. Each injury required a median of 6 lost work days with 25% of workers losing three or more weeks [5].

In the healthcare sector, high injury rates affecting the back and shoulder have been repeatedly linked to the lifting, transferring and repositioning of patients, as well as to work pace and postural strain (reaching and pulling) [6-14].

Certified nursing assistants (CNAs) and other unlicensed nursing personnel typically have higher physical workloads and higher injury rates than registered nurses [15, 16]. Nursing home caregivers perform frequent lifting, transferring, and repositioning of residents, a task which often exceeds the physical capacity of most nursing staff [17]. CNAs represent a majority of direct care workers in the long-term care sector. They are predominantly women of low education and socioeconomic status, and often minority members or immigrants, who are thus also at high risk for unhealthy behaviors as well as adverse health outcomes.

In addition to resident handling and other ergonomic hazards, numerous other exposures in the nursing home work environment threaten employees' health and safety: infectious diseases; needle sticks; chemicals; violence; and psychosocial stressors. Psychosocial strain is high among many healthcare workers and associated in them with both psychological and somatic distress [15, 16, 18-21]. Very limited evidence shows the influence of organization-level characteristics on injury rates [22].

A probably related phenomenon is that the turnover rate is extremely high among nursing home employees. One study reported the average one-year turnover rate in 354 U.S. nursing homes

to be 85.8% for nursing assistants and licensed practical nurses and 55.4% for registered nurses [23]. Turnover is expensive for employers, in terms of hiring and personnel training and disruptive for residents, including decreased quality of resident care. Thus, as NIOSH has now also recognized [24], improving this work environment could have broad public health as well as occupational health benefits.

According to Israel et al. [25], workplace interventions should be context-specific, participatory, and carried out at multiple levels of the organization simultaneously. The targeted exposure(s) should be evaluated at multiple levels in order to be certain that exposure has actually decreased and to gain greater insight into the institutional mechanisms of change, identifying potential obstacles or facilitators that operate at each level [26, 27].

This intervention study was carried out within a large chain of nursing homes, or skilled nursing facilities, belonging to a single corporation. This company, on its own initiative, implemented a "no-lift" program in all of its nursing homes, committing substantial resources to purchase of patient handling devices and implementation of various program protocols. In addition, the company offers an optional HP or "Wellness" program to each center, which had been adopted in about 30 facilities at the time that this study began. The company agreed to allow the investigators to implement an independently designed participatory HP program in selected other facilities. This alternative program included two aspects considered best practices in worksite health promotion. It was participatory in its design and development, and it incorporated an explicit social-ecological theoretical design targeting multiple levels of the social and work environment. We hypothesized that the combined effort would be more effective when new participatory structures were developed that could advance practical methods for achieving success.

Specific Aims

The specific aims of the study addressed both program effectiveness and process evaluation:

Aim 1. To examine the effect of the safe resident handling ("no-lift") program, with internal time-varying control group, conditional on facility characteristics (e.g., presence/absence of a Wellness program, patient acuity, unionization), and individual characteristics associated with the same health outcomes (e.g., age, gender, smoking, body mass index):

    a. Physical ergonomic exposures; psychosocial environment

    b. LBI and MSD rates; other health outcomes (health-related quality of life, health self-efficacy, health-attributed work and household limitations)

    c. Work outcomes: annual average turnover rate, job satisfaction and intention to turnover

Aim 2. To examine the effect of company-instituted Wellness program (WP), before and after the no-lift program, on the same health and work outcomes plus other health indicators: exercise patterns, body mass index, cigarette smoking, sleep quality, etc.

Aim 3. To design, implement and evaluate a participatory health promotion program (PHP) in a selected number of facilities, and to describe the site and group characteristics (structures, group dynamics, manager support, etc.) associated with successful initiation or inhibition of a program.

Aim 4. To compare the effectiveness of the WP and the investigator-initiated PHP program (as they interact with the SRHP) on the same health and work outcomes as above [evaluate participation levels and health benefits].

Aim 5. To utilize an economic evaluation model for assessing costs, benefits, and cost-effectiveness of interventions, and to summarize results in the form of a program evaluation model that is understandable to all study partners.

Aim 6. To utilize a social-ecological model to evaluate quantitatively and qualitatively these workplace programs as potential mechanisms for integrating health protection with health promotion, and produce recommendations for future efforts.

Methods

This study was carried out within a large chain of nursing homes belonging to a single company, Genesis HealthCare Corporation (GHCC). The study involved repeated measures of exposure and health outcomes as well as qualitative program assessments. The participating company implemented a "no-lift" or safe resident handling program (SRHP) in all of its facilities. In addition, GHCC offers an optional "Wellness" program (WP) to each facility and agreed to let the investigators implement independently designed, participatory health promotion (PHP) programs in selected facilities. Four research phases (assessment of SRHP cost-effectiveness, assessment of physical exposure and worker questionnaires to determine effectiveness of the SRHP, effectiveness of the combination of SRHP and WP, and the design, implementation, and evaluation of participatory health promotion teams) were included in the study goals.

Questionnaire surveys were conducted of all permanent full- and part- time clinical employees in 18 nursing homes within GHCC. The surveys were timed to coordinate with the implementation of the Safe Resident Handling ("No Lift") program. In 12 centers, baseline surveys (F0) were administered during the week of initial training for department heads (defined as the implementation date), just prior to installation of the resident handling equipment. Surveys were also distributed at three months (F1), one year (F2), two years (F3), and three years (F4) post-implementation. In the other 6 centers, the first (or "entry") surveys were conducted at least one year after implementation using the F2 follow-up instrument.

Nursing aides (NA), licensed practical nurses (LPN), and registered nurses (RN) were eligible to participate, if they were employed by GHCC and not temporary agency staff members. Other clinical care personnel, such as physical and occupational therapists, office, laundry, food service, and janitorial staff were recruited only for surveys in centers where participatory WHP programs were under consideration for the entire workforce or that might become part of the comparison group for the intervention centers.

Questionnaires were distributed at the nursing homes by members of the study team and completed by most workers during scheduled break times. For those who could not be met in person, such as third-shift and weekend employees, a pre-stamped, addressed return envelope was provided. Compensation of $20 was offered in exchange for each completed questionnaire returned with an informed consent form. The study proposal was approved by the Institutional Review Board of the University of Massachusetts Lowell.

The self-administered questionnaire collected detailed information on demographic characteristics (e.g., age, gender, length of education, ethnic origin), working conditions, health behaviors and health status. To the extent possible, questions were derived from pre-existing, validated items and scales, such as the Job Content Questionnaire (JCQ) [28] and the SF-12 [29]. Appendix A-1 contains a sample (F2 survey) instrument and the Table of Contents documenting the entire series of questionnaires used in this study.

PATH observations: An adaptation of the method called "Postures, Activities, Tools, and Handling (PATH)" [30] was used to record the frequencies of ergonomic exposures of nursing

assistants in nursing home work. PATH is a direct observation work-sampling-based method developed for analysis of work without short, regular work cycles. Multiple ergonomic exposures are recorded in categorical form for a single moment in time, followed by a fixed time interval (in this case, 60 seconds); the data are used to estimate the percentage of observation time that employees are exposed to each posture or activity. PATH has been validated relative to direct instrumentation [31], conditional upon adequate observer training and good inter-rater agreement [32]. Clinical nursing work lacks short, repetitive work cycles, making the PATH method a useful choice for exposure assessment.

Since the primary purpose of the observations was evaluation of the SRHP, we prioritized recruitment of nursing assistants, who perform the majority of resident handling. For the same reason, almost all observations were made during first shift, when most resident handling occurs.

In five nursing homes, we observed workers before lifting equipment was brought in to the centers (baseline) and 3 months, 12 months, and 24 months afterwards. Observations were made at ten other centers on 1 or 2 survey occasions including the 36 month follow-up. Trends in non-neutral body postures, frequency of resident handling, weight in the hands, and use of resident handling equipment were compared over the 3-year follow-up period.

The PATH data were also incorporated into a biomechanical model for assessment of net change in load on the musculoskeletal system through an index of physical workload. A model developed by Hollmann et al. [33] to integrate load from postures and manual handling, based on self-reported frequencies, was modified to incorporate the PATH ergonomic observational data [34]. The index is a summation of the relative contributions of compressive forces caused by postures and manual handling to the overall load of the spine. The University of Michigan's Three-Dimensional Static Strength Prediction Program (3DSSPP) was used to calculate compressive forces on the lumbar spine resulting from 17 combinations of trunk, arm, and leg postures and manual handling activities. Each force was multiplied by an observed frequency of a PATH variable, and the contributions were summed.

Administrative data obtained from GHCC for each center and year included workforce size (average full-time equivalent (FTE) staff) by job category; workers' compensation (WC) claims; number of skilled nursing beds; clinical staff retention rates; and whether or not there was turnover in top management positions (administrator, director or assistant director of nursing). For analyses of change in WC claim rates and costs, claims and FTE's were classified as "pre" or "post" SRHP, based on the date of each claim relative to the date of implementation in the corresponding center. Annual claim rates were computed as the number of claims per center, standardized by workforce size for that center and year of observation. In each center's year of implementation the rate was sub-divided into before and after SRHP implementation and annualized. Ratios of claims "post-" to "pre-"implementation were computed using weighted averages of claims for each of the 11 states where centers were located.

Administrator surveys: Workplace health promotion activity within individual centers was not recorded routinely at a central (regional or corporate) level. New England GHCC centers were surveyed in January 2007 by their regional risk manager to learn about wellness activities implemented in 2006, and activities planned for 2007 (group walking, improving vending machine offerings, massage chairs for stress reduction, etc.). To supplement this, the investigators developed a survey for center administrators to assess WHP activity within the centers; this survey was piloted and reviewed by GHCC corporate personnel and distributed electronically to all administrators in May 2007. Results of these two data sources were compiled to categorize centers as having no, "emerging," or "well-developed" WHP programs.

<u>Focus groups:</u> Twenty-seven focus groups were conducted with certified nursing assistants (CNAs) in seven GHCC centers: four in Massachusetts, one in Rhode Island, one in Maine, and one in New Hampshire. The initial purpose of the focus groups was to gain background and insight as part of a selection process for possible intervention sites in which to establish participatory occupational health/health promotion programs. Four centers were prospective intervention sites and three were control sites with preexisting wellness programs.

Each focus group was facilitated by a trained moderator with a research assistant and consisted of open-ended questions around topics related to the long-term care work environment: ergonomic issues, opportunities for worker participation, health promotion programs, and any other health and safety concerns. At prospective intervention sites participants were asked to describe the "ideal" nursing home. Control site participants were asked to describe current and previous health promotion activities. Each participant received compensation.

Data analysis took part in two phases. The first phase was to read all focus group transcripts and extract relevant sections and quotes pertaining to pre-identified topics of interest such as work organization issues such as lack of teamwork, stress, and relationships with residents. The gathered data extracts were then coded for major themes that emerged; the authors met to discuss themes and ensure consensus on coding and relevance. In the second phase, data extracts were read again and coded for emergent sub-categories. Memos were also written at this time about how the particular data points expressed the main theme, how it was related to other points in the same sub-category, as well as any noted links to other themes. After this coding the authors discussed and came to consensus on final themes, sub-categories and connections between them.

<u>Statistical analyses</u> are presented in further detail in each section of the Results.

Results

Questionnaire surveys and job observations were conducted in 18 skilled nursing facilities owned or managed by Genesis (Table 1). Questionnaires were obtained from a total of 2,727 participants (at least one per person) (see Inclusion Enrollment Report). Altogether we observed 446 worker-shifts, for a total of 98,903 observation moments. Of these, 361 person-shifts were of nursing assistant (76,126 observation moments) on the first shift, when most resident handling occurs.

Table 1. Questionnaires (Q's) collected and direct job observations (PATH) performed in 18 nursing homes

State (# centers)	F0: Baseline (Pre-SRHP)		F1: 3 months post-SRHP		F2: 12 months post-SRHP		F3: 24 months post-SRHP		F4: 36 months post-SRHP	
	Q's	PATH	Q's	PATH	Q's	PATH	Q's	PATH	Q's	PATH
Maryland (8)	658	68	707	55	684	94	660	60	---	---
Maine (4)	262	13	250	14	319	14	326	12	129	10
Massachusetts/ Rhode Island (6)	---	---	---	---	586	27	305	31	655	48
TOTAL	920	81	957	69	1589	135	1291	103	784	58

Overall, survey respondents were 89% female. Based on the F2 survey responses, almost one-half (47%) were white, non-Latino, with a large difference by region: 67% African-American or African in Maryland and a majority white in New England. The average age was 41 years (standard deviation, SD, 13); nursing aides were about 5 years younger than other employees, on average. The mean length of work in the same type of job was 11 years (SD 10), although one in four workers reported over 17 years seniority.

The age, gender, and race distributions were all quite consistent with the workforce demographics for these workplaces. In the 4 centers where non-clinical workers were recruited they were slightly under-represented (34% of all employees but only 20% of respondents). Lifetime experience in similar work (from questionnaires) was 6 to 8 years more than seniority in the current job (from workforce rosters).

Aim 1. To examine the effect of the SRHP conditional on facility characteristics (e.g., presence/absence of a Wellness program) and on individual characteristics associated with the same health outcomes (e.g., age, gender, smoking, body mass index).

a. Physical ergonomic exposures
In the survey data, **physical exertion** was rated higher by aides than other workers (F0: 13.6 vs. 11.8; F1: 13.1 vs. 11.4; F2: 12.6 vs. 11.0; F3: 12.7 vs. 10.8). A downward trend over time was seen in both groups, although the ratings decreased more gradually among non-aides than aides. Steeper drops in scores occurred at 12-month follow-up in both groups (ranges: 2-8). Thus the respondents reported improvement in physical exertion, especially among NAs, for whom the SRHP would be expected to have more effect.

Perception of **safety at work** also increased over time, on average (F0 & F1: 2.7, F2 & F3: 2.8). These scores also tended to be slightly lower among aides (F0 & F1: 2.6; F2 &F3: 2.7), than among other workers (F0 & F1: 2.7; F2 &F3: 2.9).

Ergonomic exposures for nursing assistants were examined using PATH observational data collected from 12 centers (4 in MD, 5 in MA, 2 in ME, and 1 in RI) on 5 occasions, from F0 through F4 [34]. A statistically significant (Cochran-Armitage, p < 0.001) trend was observed for resident handling activities (ambulation assist, reposition, transfer, and transport) which decreased from 13.3% of total observations at baseline (F0) to 9.5% at 12-month follow-up (F2) to 8.9% at 24-months (F3) then slightly increased to 11.7% at 36-months (F4).

A statistically significant trend was observed for the proportion of all resident handling observations with equipment use (gait belts, slideboards, slipsheets, slings, sit-stand lifts, and total body lifts) which increased from 9.9% (F0) to 17.4% (F2) to 19.4% (F3) to 32.1% (F4). After two years, nursing assistants were using the lifting equipment more than 50% of the time while transferring. However, lifting equipment was used only about 12% of the time while repositioning. While this is an increase from about three percent at baseline, this data may indicate that there are some gaps in the current training at the centers.

Meaningful downward trends were also observed for frequency of non-neutral body postures and manual handling while performing resident handling activities (Figures 1-4).

Figure 1: Changes in Trunk Angle While Resident Handling*
* Resident Handling = Ambulation Assist, Reposition, Transfer and Transport
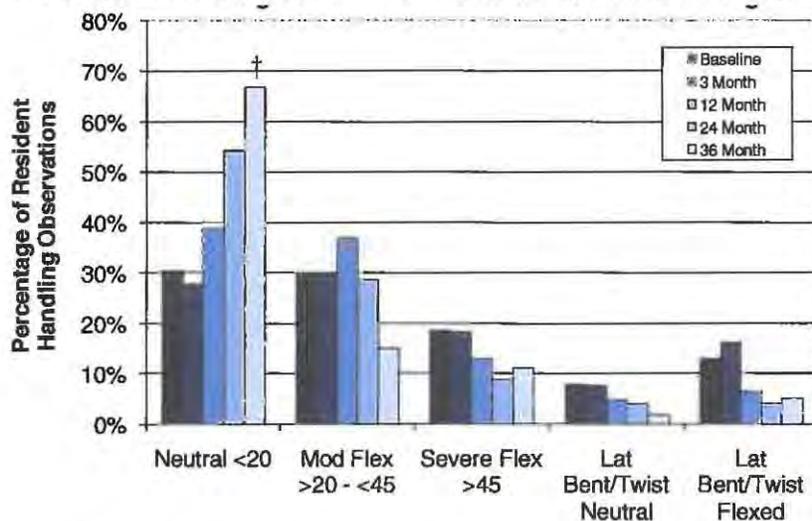
† p < 0.001 (Cochran-Armitage test of trend)

Figure 2: Changes in Leg Action While Resident Handling*
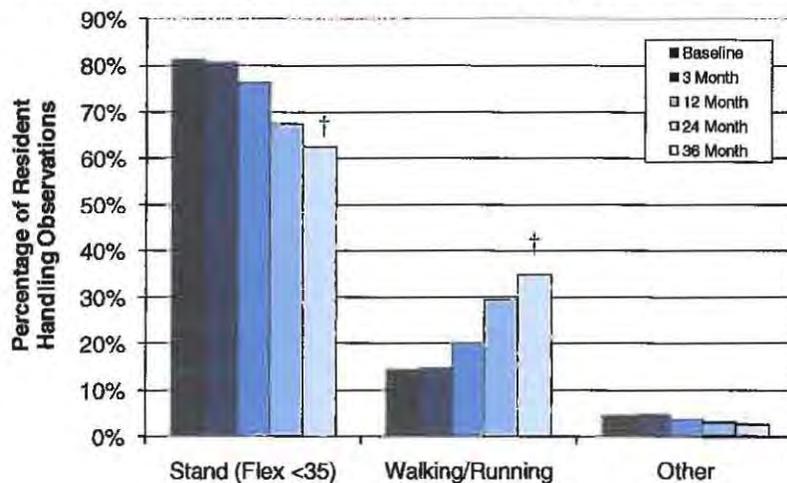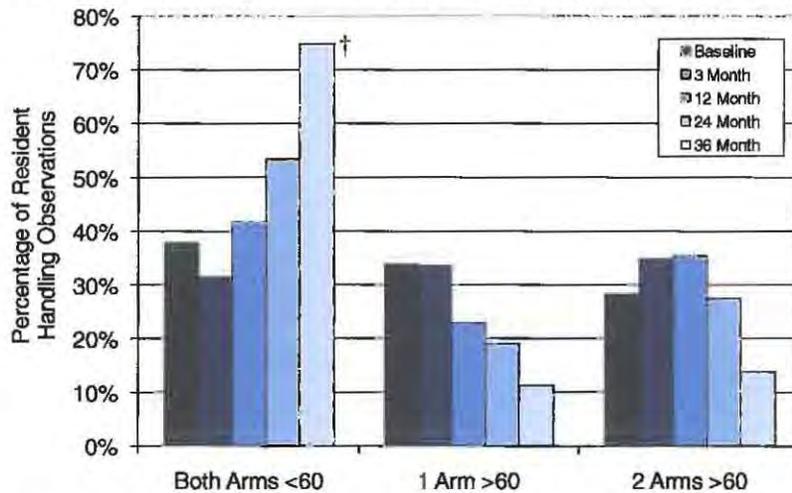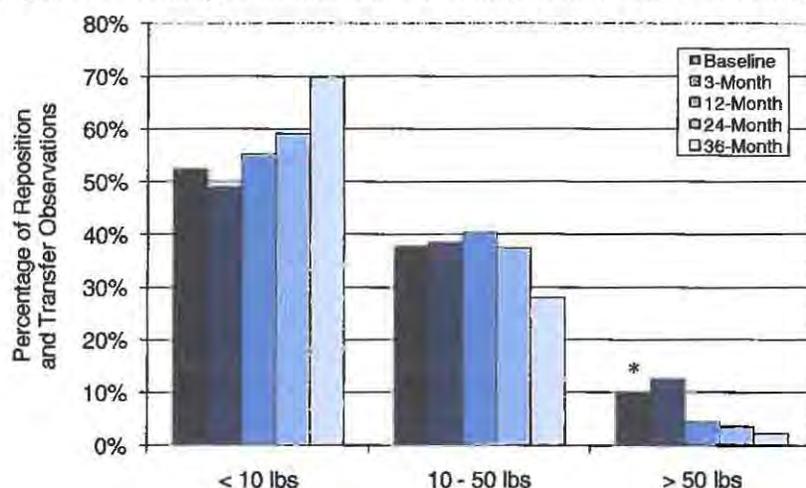* Resident Handling = Ambulation Assist, Reposition, Transfer and Transport

† p < 0.001 (Cochran-Armitage test of trend)

Figure 3: Changes in Arm Angle While Resident Handling*
* Resident Handling = Ambulation Assist, Reposition, Transfer and Transport

† p < 0.001 (Cochran-Armitage test of trend)

Figure 4: Changes in Manual Handling While Repositioning and Transferring

* p < 0.001 (Cochran-Armitage test of trend)

At F3, handling equipment was observed in use in 56.8% of the observed transferring and 12.1% of the repositioning activities. This observed frequency for use of handling equipment during transferring is fairly close to what the nursing assistants reported in the questionnaires collected at the same time. About two-thirds answered "always" or "often" to a question about using lift devices when moving residents on each of the three follow-up surveys.

Time of Day

Analysis of exposures by time of day sought to quantify the patterns of equipment use and resident handling activities by GNAs across observation periods (F0-F4), and to determine whether time of day might be a potential confounder of our pre-post comparisons of these exposures. The most strenuous manual handling activities is known to occur between the hours of 7:00 am and 11:00 am, when most direct care of residents takes place. The lightest manual handling activities occur at mealtimes, between 11:00 am to 1:00 pm and 3:00 pm to 5:00 pm, and toileting activities occurring between 1:00 pm and 3:00 pm fall between the extremes of light and heavy manual handling. Observations were grouped into 'heavy,' 'medium,' and 'light' work periods to examine whether any observed change in frequency of resident handling activities or equipment use was attributable to the time of day of the observations. At each survey period, about 50% of observations were made in the 'heavy' work period. Analyses suggest that changes in resident handling activities, equipment use, and postures are not explained by the time of day the observations were made.

Biomechanics Evaluation of the Intervention

Over the three years following the intervention, the physical workload index (PWI) decreased for both nursing assistants and nurses (Figure 5). For nursing assistants, the PWI decreased by 24.2% and by 40.9% when restricted to resident handling; while the PWI for nurses decreased by 2.5%. Both populations show a slight increase in the PWI at the 3 month follow-up, followed by more dramatic decreases in the index at 12, 24, and 36 months, which is consistent with the

trends in observed frequencies of body postures and manual handling when examined individually.

Figure 5: Physical Workload Index for Nurses and Nursing Assistants
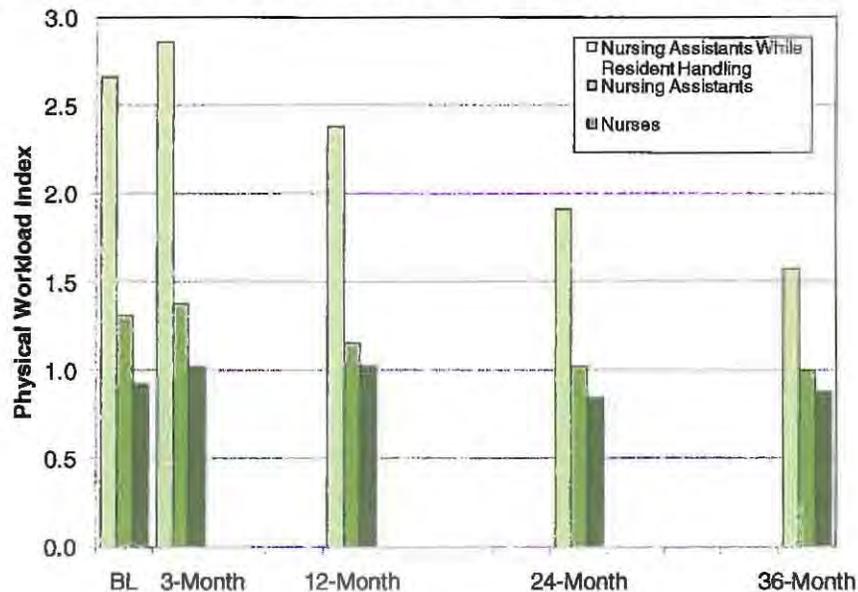
Between-Center Variation

The changes in the observed frequency of manual handling activities, equipment use, and postures among nursing assistants was stratified by center, including the five centers where ergonomic observations were made at each of four time periods [34]. Two outcome measures were considered: changes in equipment use while resident handling and changes in the PWI for nursing assistants over a two-year period following the intervention. Over two years, across-center variation in physical workload and equipment use while resident handling was observed to varying degrees (Figures 6-7).

Figure 6: Equipment Use While Resident Handling at Five Nursing Homes

	Center A	Center B	Center C	Center D	Center E
	y = 0.0003x	y = 0.0128x	y = 0.0122x	y = 0.0099x	y = 0.0111x
	+ 0.2358	+ 0.0015	+ 0.1286	+ 0.0133	+ 0.0368
	R^2 = 0.0019	R^2 = 0.9977	R^2 = 0.7243	R^2 = 0.994	R^2 = 0.7228
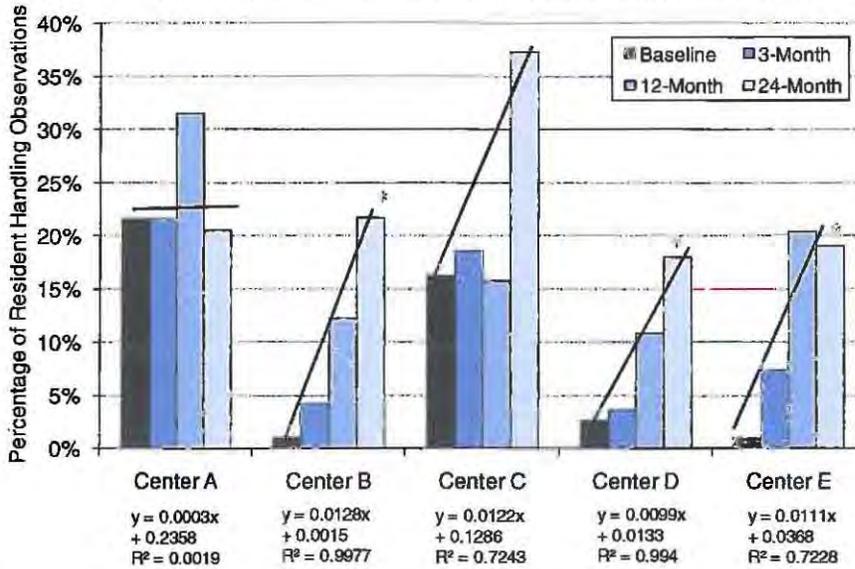
* $p < 0.001$ (Cochran-Armitage test of trend)

Figure 7: Physical Workload Index of Nursing Assistants at Five Nursing Homes

	Center A	Center B	Center C	Center D	Center E
	y = -0.0263x	y = -0.0815x	y = -0.0126x	y = -0.0476x	y = -0.0351x
	+ 1.2057	+ 1.6354	+ 1.2122	+ 1.4435	+ 1.3461
	R^2 = 0.8798	R^2 = 0.9115	R^2 = 0.3435	R^2 = 0.8018	R^2 = 0.8208
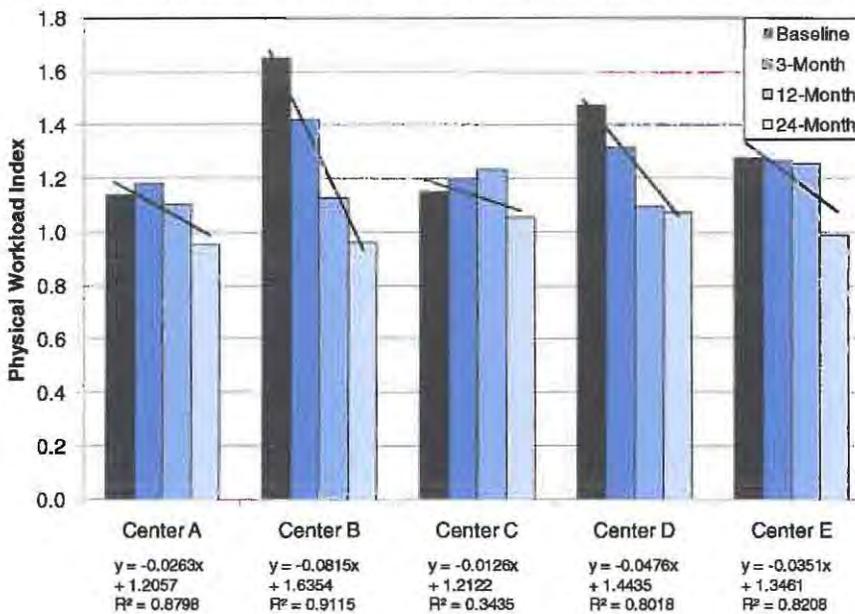
Information regarding sources of variation was gathered from administrative databases, self-reported survey responses, employee satisfaction surveys, and through exit interviews following ergonomic observations. Of the factors considered, significant correlations related to the outcome measures were the percentages of agency staff used to fill shifts, work shifts involving obstacles to getting work done, 'never' feeling time pressure, adequacy of supplies and equipment, 'poor' ratings for quality of teamwork and staff-to-staff communication, and observed understaffed shifts. The facility with the most positive outcome measures was associated with

many positive changes in explanatory factors and the facility with the least positive outcome measures experienced negative changes in the same explanatory factors.

Qualitative Assessment of the SRHP (Y4)

The UML ProCare project manager assessed one center qualitatively to 1) examine the reasons why the lift equipment is not always used when it should be; and 2) motivate center managers to engage care-giving staff more actively in problem-solving related to injury prevention. This included identification of resource needs for no-lift program sustainability and other aspects of work organization related to accidents and injuries.

A short, customized report was provided to a small group of center managers and care-giving staff that summarized the most recent survey questionnaire responses about lift program use, barriers to use, perceptions about lift equipment effectiveness, and musculoskeletal symptoms. The report was reviewed and discussed in individual meetings with the Administrator, Director of Nursing, No-Lift Program champion (the nurse educator) and a Geriatric Nursing Aide Specialist (GNAS). In these same meetings, a semi-structured interview script was used to explore perceptions of the no-lift program and discover possible areas for quality improvement and next steps. Topics included survey date on lift program usage, lift program effectiveness, program management (division of labor, challenge areas), management support roles, resources needed for sustainability, and other injuries.

Perspectives of the interview participants were consistent in several areas, including program effectiveness, program management, social support, and challenge areas. The withdrawal of Prevent, Inc. (the third-party nurse trainers) was not perceived as having negative impacts. Gaps and issues identified through the interviews included communication, program oversight, employee participation, unintended increases in job demands, unintended consequences for residents. This qualitative follow-up was useful for identifying areas for improvement in communication and maintenance (battery charging), and for stimulating management interest in continuing quality assurance for the lift program, including on-going evaluations.

Ergonomics training programs were offered to 3 nursing homes under the auspices of the health and wellness teams. The expanded training program included a small group activity to identify physically challenging tasks on the job and possible solutions. These discussions provided the wellness teams and ProCare investigators with a rich source of data on hazardous tasks that were not addressed by the no-lift program. This activity also generated a useful source of feedback on the SRHP and action items for the wellness teams. While each facility has its unique physical characteristics and protocols, there was substantial overlap between the concerns reported in both centers. The no-lift program appropriately addressed the transfer of non-ambulatory residents in specific situations. When performed manually, these transfers are among the most physically challenging tasks in direct care. However, there are many other physically challenging direct care tasks that were not addressed by the SRHP, for various reasons. Examples include, lifting equipment does not fit into the physical space where the transfer occurs; staff perceive that the equipment assigned for specific tasks is not worth the effort; the task cannot be performed by the available lifting devices, or the devices do not reduce the load even when utilized; several tasks that are physically challenging to perform do not involve patient transfers and thus are not addressed by the intervention; staffing concerns exacerbated these issues or led to additional exposures; and non-clinical job titles have many exposures to musculoskeletal risk factors.

a. Psychosocial environment

Changes in working conditions were examined by comparing the average reported scores at baseline (F0), 3-month (F1), 12-month (F2), and 24-month (F3) follow up periods. Information gathered from all participants in all centers was compared over time, and job groups (aides versus non-aides) were also contrasted.

Mean psychosocial **demand scores** were stable over time (F0: 5.8 vs. F1: 5.7; ranges: 2 − 8) over time and varied by occupational group. Aides reported slightly higher psychological job demands (aides: 5.7 - 5.8, non-aides: ~5.6), with a slight downward trend in both occupational categories (aides: F0 & F1: 5.8, F2 & F3: 5.7; non-aides: F0 5.7; F1, F2 & F3: 5.6). At the beginning of the study, **decision latitude** (job decision authority and skills discretion) was higher among non-aides than aides (non-aides: F0 &F1 − 5.9, aides: F0-5.3, F1-5.2, p (<.0001). However, this difference was not found in later surveys, as the ratings both decreased and converged (scores among aides and non aides ranged from 4.6 to 4.7 at F2 and F3).

Generally, **control over work schedule** was slightly higher at baseline than follow up and slightly higher among non-aides (non-aides at F0 − 5.9 vs. aides − 5.8, ranges 2-8). **Work-home imbalance** ratings were very stable over time. The scores were slightly higher among non aides than aides (exception: F2), indicating that aides perceived work–home issues to be better balanced.

Coworker support (5. 6 − 5.8; range 2-8) was rated slightly higher than **supervisor support** and varied by job category (scores~5.6; range 2-8). There was an overall gradual increase in perceived coworker support during the first year of the study (F0-5.6, F1- 5.7, F2 & F3-5.8). However, no apparent changes were noted in overall supervisory support (F0 & F1 & F2-5.6, F3- 5.5). Aides rated coworker support higher than supervisory support, while the reverse situation was seen among non–aides.

b. Health outcomes, health behaviors, health attitudes

Workers' Compensation Claims

These analyses covered the period from 2003 to 2009 to maximize the length of observation both before and after implementation of the No-Lift Program. The 129 nursing homes with complete numerator and denominator data had an average annual employment of 13,652 FTEs. Over the 7-year period, they recorded a total of 14,802 WC claims.

Most claims were coded by nature of injury as "sprains and strains," with "pain-not otherwise classified (NOC)" as the second largest group. The distribution changed slightly for post-intervention claims, with a shift away from pain NOC to strain/sprain (Figures 8 and 9).

Figure 8: Nature of Injury, Pre-Intervention. Figure 9: Nature of Injury, Post-Intervention.
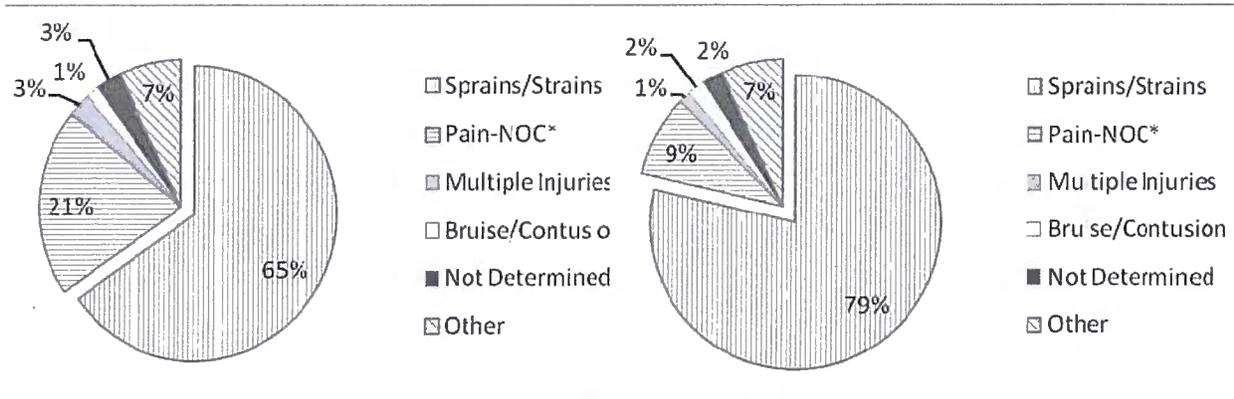
With regard to body part(s) affected, the lower back accounted for the largest percentage of each group: 43% of sprains and strains (all years combined) and 27% of pain NOC.

The mean and median ratios of claims post- vs. pre-intervention for all 129 centers were 0.94 and 0.88, respectively. Eighty-six centers (67%) experienced an overall decrease in their workers' compensation claim rates, while 43 centers (33%) experienced either an overall increase or no change (Figure 10). Workers' Compensation claim rates decreased in all 11 states after the implementation of the Safe Resident Handling Program.

Figure 10: Ratios of Workers' Compensation Claims by Center* (Post-SRHP to Pre-SRHP)
*Excludes centers missing claim data and centers with discrepancies in the number of FTEs
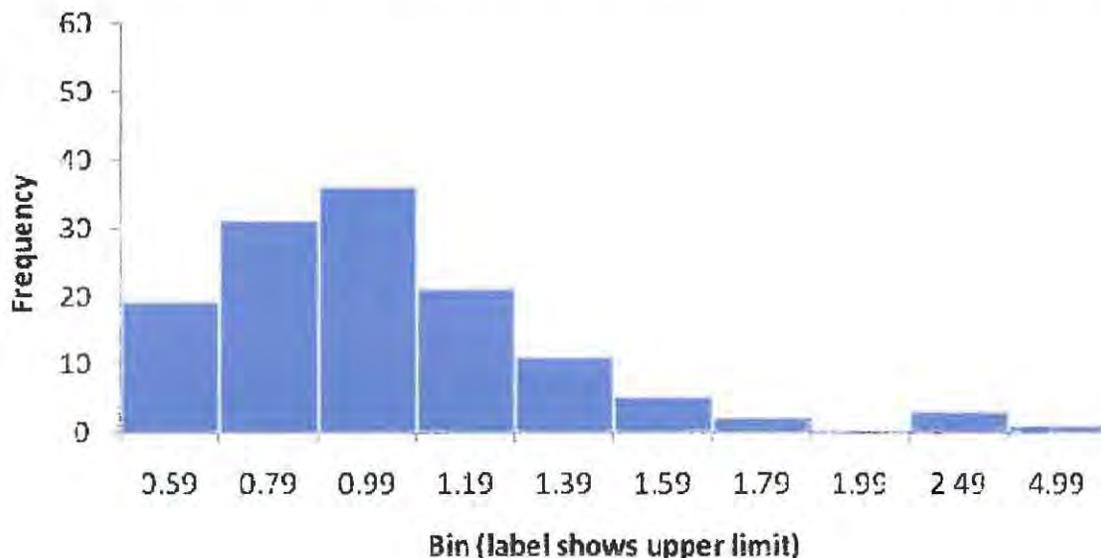
Age and gender distributions were extremely similar among the centers (C.V. for age=0.067; 93% female). Thus, at the group level, neither of these demographic variables had any explanatory power for center injury rates.

Thirty-five percent of all 'pre' claims, compared to 26% of all 'post' claims, involved "patient handling" (Figure 11, below). The majority of resident handling claims affected the lower back (36%) and back (including other back) (17%). Fifteen percent of the resident handling claims affected "other" body parts, including the neck, chest, arms, and elbows. Overall there were few changes in distribution of body parts injured before versus after the SRHP.

Figure 11: Ratios of "Patient Handling" Workers' Compensation Claims by Center* (Post-SRHP to Pre-SRHP)

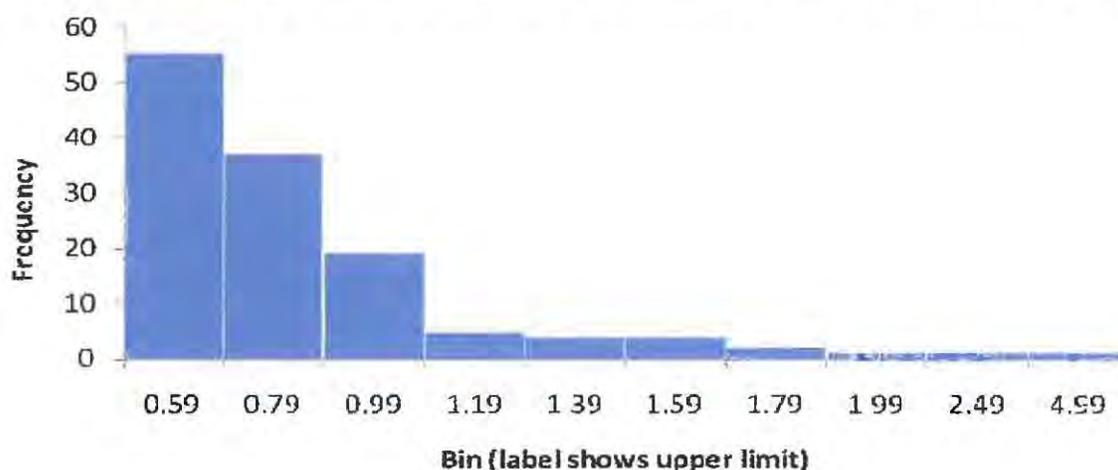*Excludes centers missing claim data and centers with discrepancies in the number of FTEs

Bin (label shows upper limit)

Musculoskeletal Symptoms

Back and shoulder symptoms have been assessed in each of the four surveys, so a complex multi-level dataset has been generated. (Analysis will be continuing on these analyses during the carry-forward period.)

Of the respondents in F0 surveys and new respondents in F1 surveys, more than 70% reported **symptoms of musculoskeletal disorders** (MSDs) in at least one body part during the previous three months. The prevalence of pain by specific body region was: low back (50%), shoulder (27%), knee (50%) and wrist or forearm (21%). Eight percent of respondents said that their pain interfered significantly with their work. Low back pain was reported by 52% of all workers at F0, dropping to 48% at F1. In analyses restricted to respondents in both surveys, there was a similar reduction in both low back (54% to 49%) and shoulder pain (29% to 25%) but not in wrist/hand or knee symptoms. Although baseline prevalences did not vary notably by age, there was a larger decrease in symptoms in younger workers for each body region except the knees. Among all respondents to both surveys, there was a decrease in the proportion at F2 reporting any limitation in ability to work because of back or knee pain.

There has been a slight downward (but non-linear) trend in prevalence of back and shoulder symptoms, and a more impressive decrease in the incidence of new disorders from one survey to the next. For example, among those with no shoulder pain at F0 (baseline), 21% had new symptoms one year later (F2). In contrast, from F2 to F3, the corresponding value was only 14%. Back cases showed a similar, although small, decrease in incidence as well as persistence in the second compared to the first one-year interval.

Intriguingly, there seems to be some effect modification of the effect of physical exposures by the SRHP. The odds ratio for "very much" lifting (self-reported) was much lower in the F3 survey than in the baseline or one-year follow-up (Figure 12). This suggests either that the lifting tasks became less demanding, even if their frequency did not change, or that the threshold for reporting "very much" lifting decreased over time as workers adapted to the change in physical demands associated with the SRHP.

Figure 12: The risk of shoulder pain related to exposure to lifting
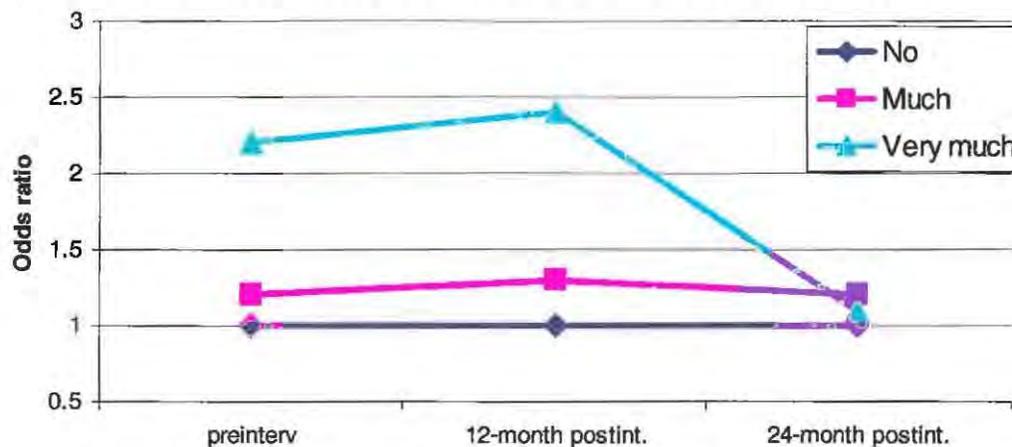
Several analyses of baseline data have examined correlates of musculoskeletal symptoms and health behaviors, which are the targets of the interventions being evaluated. For example, musculoskeletal symptoms at baseline were strongly associated with history of recent **assault at work** by a resident, resident's visitor or family member [35]. These trends remain virtually unchanged after adjusting for age, gender, region, education, psychological demands of work, job control, supervisor support, work-family imbalance, and self-assessed physical demands of work. In analyses of any assault vs. none, stratified on good vs. poor safety climate, there was a much higher prevalence for any assault in a poor climate than a good one.

Personal Health

In F0/F1, 92% of questionnaire respondents' **self-rated health** was rated 'good' or better. Compared to those with fair/poor self-rated health, respondents with higher self-rated health were more likely also to report good supervisor support, good balance between work and family life, low levels of job strain, and no physical assaults in the workplace. In F2, self-rated health was judged to be 'excellent' or 'very good' by 55% of all respondents and the distribution was unchanged across the three surveys. The baseline SF-12 physical health subscale (PCS) averaged 51.0 (SD=8.6, 25%ile=45.8); however, the mental health subscale (MCS) averaged only 47.9 (SD=10.0, 25%ile=41.2), which compares unfavorably with the general population mean of 50.0. The same trend was observed in both follow-up surveys. Further analysis of baseline SF-12 MCS (mental health) scores showed that they were lower in LPN's and RN's than nursing aides. In multivariable linear regression modeling, mental health was also lower with increasing age, BMI, physical awkward work, and work interference with home life, while weekly aerobic exercise and co-worker support had protective influences (model R2 = 0.152).

In F0/F1, 39% of respondents reported being diagnosed with one or more **chronic health conditions** (diabetes, high blood pressure, high cholesterol, or low back disease). Hypertension was the most common of these. A body mass index of 25 or higher was found in 73% and was much more common in those with chronic health conditions. The frequency of **smoking** for survey respondents (23%) was similar to the national rate for female adults (22%). Six of ten smokers reported that they plan to quit within the next 6 months, and 58% were confident they could succeed. Smokers were more likely to report high job strain and were also more likely to have experienced physical assaults at work. More than half of respondents reported **exercising** (to work up a sweat) only sometimes or never. Six of ten non-exercisers

said they planned to begin exercising more, but only 39% were confident that they could do so for 6 months. Only 30% reported that they plan to lose weight.

An analysis of **sleep quality** from F2 to F4 indicated that the percentage of clinical staff (aides and other clinical) reporting 'good' or 'fairly good' sleep quality decreased over time, while other employees' sleep quality remained constant (Figure 13).

Figure 13: Changes in Good/Fairly Good Sleep Quality by Job Category
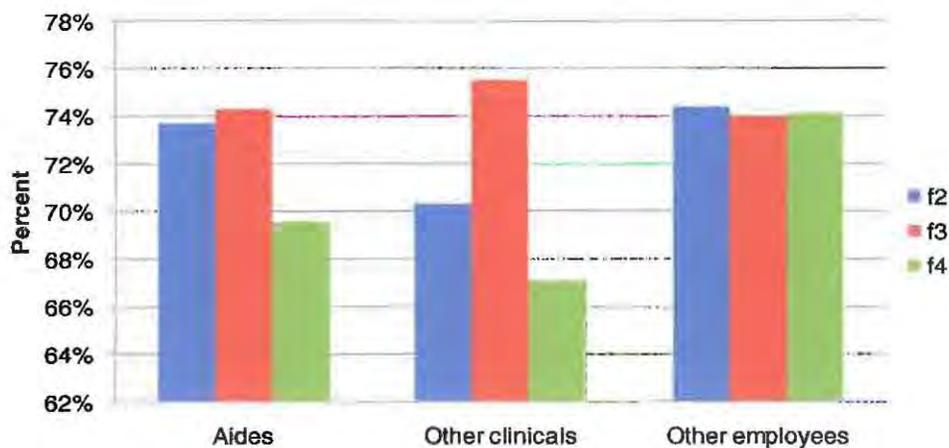
In F2, nursing home employees reported high exposure to psychological demands (88% of respondents), awkward postures (65%), poor safety climate (60%), lifting heavy loads (57%) and imbalance in work-family life (43%). The prevalences of obesity, physical inactivity and current smoking were 35%, 23% and 24%. Among these workers, the risk of "personal" health risks increased linearly with the number of job exposures such as low decision latitude, low social support at work, physically heavy work, regular night shifts, and recent physical assault at work. For obesity, the odds ratios were 3+ for 2 or more exposures, up to 4.2 for workers with 4 or 5 exposures. The trend was much steeper for workers under 40 years of age. Current smoking was more than 4 times more frequent for workers with 4-5 similar job features, and again most of this effect was confined to younger workers. The risk of being physically inactive was 2.5 for multiple exposures, with no evidence of effect modification. All models were adjusted for age, gender, education and region. These findings collectively underscore the need for worksite health promotion programs to take into account the effect of working conditions on the health and health behaviors of individual employees.

Analyses of 12-month open-ended responses provide valuable insights into participants' views concerning how the work environment impacts their health either positively or negatively. Having too few staff was the top work-related issue that workers identified as having a negative impact on their health. Heavy lifting, stress, and physical environment (lack of cleanliness, neatness) were the next most common factors cited. The most commonly listed "bad effects" resulting from these factors were body pain (19%), stress (19%), getting sick (13%), and exhaustion (8%). On the other hand, teamwork/co-worker support was the most common factor identified as positively impacting health. Care for residents, physically active work, and the no-lift program were also cited as beneficial to health. The most commonly listed "good effects" were being healthy overall (28%), satisfaction with life (21%), reducing stress (9%), and no heavy lifting (6%).

c. Work outcomes: annual average turnover rate and intention to turnover

Turnover

Turnover rates were calculated for clinical staff in 138 centers in the 11 states where centers are located. Turnover decreased post-intervention for aides and nurses (LPNs and RNs) (Figure 14).

Figure 14: Staff turnover, by job group, relative to SRHP implementation date in each center (n=138 facilities)
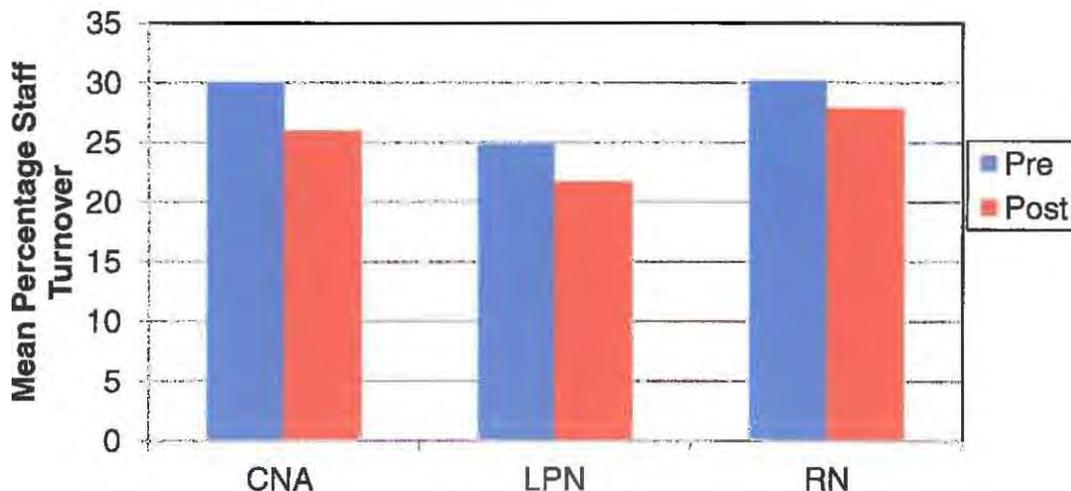
Intention to Leave

Over the study period, aides' **intention to leave** the job decreased from about 45% to about 26% (Figure 15). Similar decreases were not noted for other clinical employees or other nursing home employees however. Intent to leave for other clinical employees was around 35-40% throughout the duration of the study. Other employees' intent to leave fluctuated between about 24-34% of those surveyed.

Figure 15: Change in Intent to Leave among Clinical Staff (3 years of follow-up)
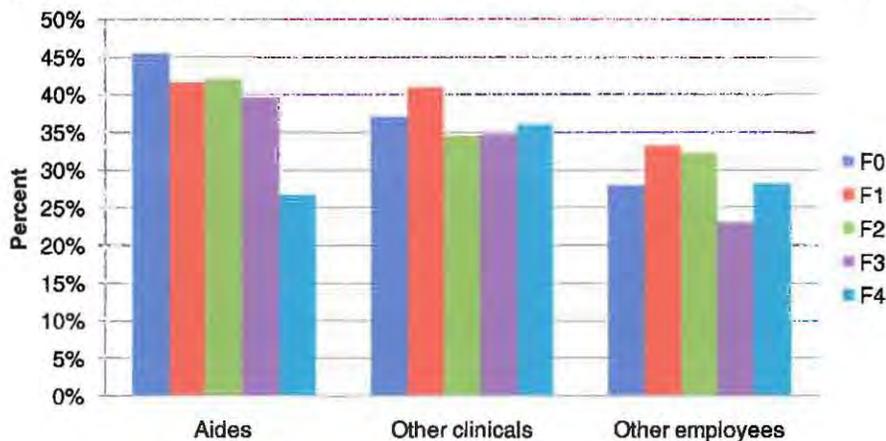
The association between working conditions and intention to leave among employees was examined, along with the possible mediating role of mental health [36]. From the questionnaire data, a working condition index representing the number of beneficial job features was constructed with dichotomized working condition variables for coworker support, supervisor support, feeling respected, and decision-making opportunity. Poisson log regression models showed employees' strong intention to leave was reduced significantly when the number of beneficial job features was two or more. For employees who reported four beneficial job features, their "strong" intention to leave reduced by 77% (PR=0.23, p<0.001). Age was not an effect modifier for the association. The strength of the relation between working conditions and strong intention to leave was slightly mediated by employee mental health. The effect of Δ interquantile range (41.97-57.06) of mental health on the prevalence of employee strong intention to leave is 30% (PR=0.98, p=0.05). It is possible that, over time, improvements in working conditions and self-efficacy (empowerment) might reduce turnover.

Job satisfaction

Employee satisfaction surveys, available to employees in all job categories, were designed by a third-party research company [37] (Appendix A-2) and administered locally at each facility. Survey results were made available by the nursing home corporation for the years 2005 through 2009. Results from five of the centers where ergonomic exposures were collected at four time periods were analyzed for correlation with equipment use while resident handling and the physical workload index (PWI) for nursing assistants [34]. Four questions were chosen for analysis: "Rate this facility on the adequacy of equipment and supplies to do your job," "Rate this facility on how your co-workers work together as a team," "Rate this facility on staff-to-staff communication," and "What is your recommendation of this facility as a place to work?" A four-point Likert scale ranging from 'poor' to 'excellent' was used to rate responses for each item. Using only responses from nursing assistants at each center, the mean value and percentage of 'poor' responses for each question were calculated for each of the study years (2006 to 2008 for four facilities and 2007 to 2009 for one). Percent change from baseline values for both mean survey responses and percent 'poor' responses was calculated for each facility.

The decrease in mean *adequacy of equipment and supplies* was significantly correlated with slopes decreasing in magnitude for the PWI (-0.90, p = 0.037) (Figure 16, below). Increases in the percentage of 'poor' ratings for *quality of teamwork* were significantly correlated with weaker slopes for the PWI while resident handling (1.0, p <0.0001). As change in mean *staff-to-staff communication* decreased, the magnitude of the slope for the PWI decreased (correlation coefficient = -0.70, p = 0.188) (Figure 17, below).

In addition, increases in the percentage of 'poor' responses for staff-to-staff communication were significantly correlated with the slopes decreasing in magnitude for the PWI (1.0, p < 0.0001) and the PWI while resident handling (0.90, p = 0.037). Increases in mean rating of *"would recommend this job"* were associated with increasing slopes for equipment use while resident handling (correlation coefficient = 0.70, p = 0.188) and slopes decreasing in magnitude for the PWI (correlation coefficient = 0.70, p = 0.188). In general, facilities with more positive outcome measures were associated with many positive changes in employee satisfaction and facilities with fewer positive outcome measures experienced negative changes in the same employee satisfaction categories.

Figure16: Slope for Physical Workload Index vs. Percent Change in Perceived Adequacy of Supplies and Equipment
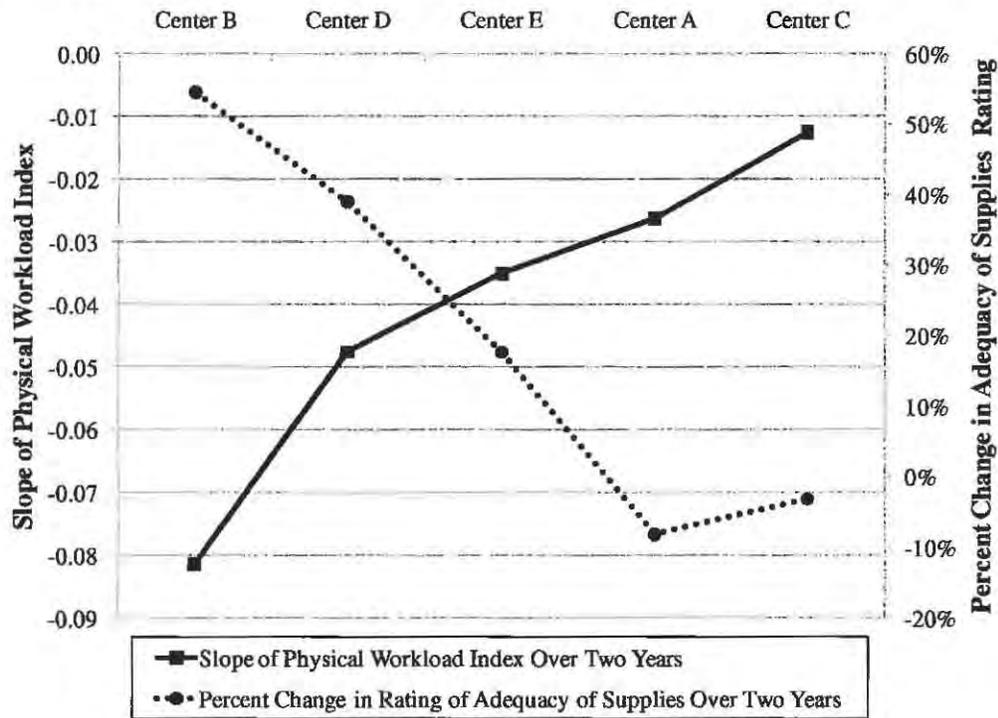
Figure 17: Slope for Physical Workload Index vs. Percent Change in Perceived Staff-to-Staff Communication
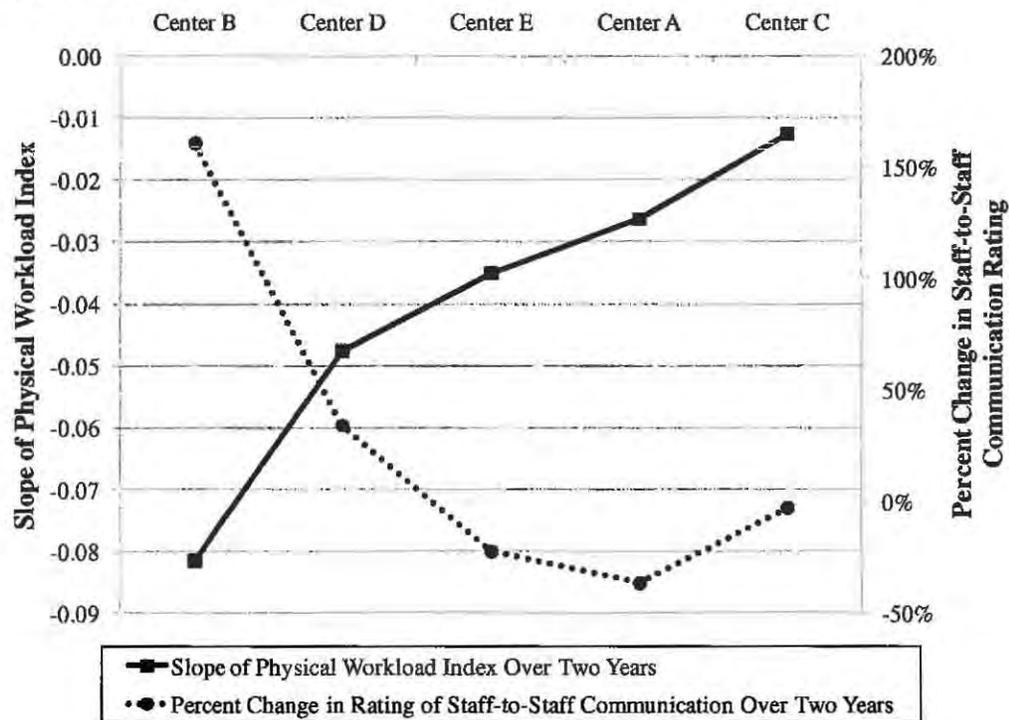
Aim 1 – Discussion and Conclusions

The goal of Aim 1 was to evaluate the SRHP in terms of physical ergonomic exposures, the psychosocial environment, LBI and MSD rates, other health outcomes, and work outcomes. There is evidence that the SRHP led to improvements for clinical staff in many areas such as reductions in ergonomic exposures, reductions in workers' compensation claims, reductions in turnover, and reductions in aides' intent to turnover.

The pre-post intervention design, with post-SRHP data collection at four time points (3-month, 12-month, 24-month, and 36-month), strengthened the evidence of both short-term and long-term impact of the SRHP on these workplace exposures and health and work outcomes. PATH observations provided quasi-objective evidence of change in ergonomic exposures of nursing assistants. Results from PATH observations included increased use of handling equipment while transferring, more neutral body postures and less manual handling of heavy objects while performing resident handling activities. These were consistent with the survey data showing that nursing assistants' perceived physical workload decreased post-SRHP.

Nonetheless, the SRHP could still be enhanced. Some CNAs acknowledged not always using device for resident handling; the various reasons suggest further opportunities for training and environmental improvements. Nursing assistants used equipment more often for transfers than repositions. However, the handling equipment provided includes slide boards and slipsheets in addition to the lifts. The former devices are inexpensive, available at the facilities, and could help to reduce stress on the body while performing lateral transfers.

In general, a diverse set of health behaviors and outcomes, such as smoking, exercise, self-rated health, and musculoskeletal symptoms, were associated with work environment features such as physical workload, decision latitude, social support, job strain, and physical assault at work. Overall, working conditions such as coworker and supervisor support were perceived to be slightly more favorable among non-aides than aides. It also appeared that some of these working conditions improved slightly over the course of the study; e.g., participants felt safer at work and experienced a better work-home balance. While overall perceived coworker support increased over time, supervisor support remained stable. Scores reflecting psychosocial demand remained similar over the study period, while scores indicating decision latitude and ability to choose the work schedule decreased. Small changes over time might reflect the positive effect of the intervention program, although social desirability cannot be ruled out. In addition, we learned late in Year 5 that other programs were underway within GHCC which might also have had beneficial effects on the psychosocial work environment. Thus, not all changes can be attributed to the SRHP.

One important limitation of these analyses is the lack of a concurrent control group. Originally, we planned to collect pre-intervention data twice in some centers in order to have an internal time-varying comparison. This would have permitted estimation of pre-intervention trends in symptoms and compensation claims, rather than one-time values only. However, because the intervention was implemented so quickly corporate-wide, by the time the award period began the remaining centers were on the verge of implementation and in fact we had to begin data collection slightly in advance of the project start date. In addition, we were able to collect data in several centers newly purchased by GHCC in Year 2 of the project. Thus data were collected on one pre-intervention (baseline) occasion at centers in Maryland (8) and Maine (4).

Data on resident acuity could not be obtained from GHCC within the scope of this project, so to date the influence of residents' health status on SRHP effectiveness has not been assessed. Also, no unionized centers could be included in the questionnaire surveys, because of the timing of SRHP implementation, so this factors also has not been examined to date.

Aim 2. To examine the effect of company-instituted Wellness program (WP), before and after the no-lift program, on the same health and work outcomes plus other health indicators: exercise patterns, body mass index, cigarette smoking, sleep quality, etc.

In January 2007, GHCC mandated that all New England centers implement an employee wellness program (WP). The program is customized locally but broadly defined by GHCC to include monthly themes on a variety of physical and mental health issues. A small budget of $700 per year was provided to each facility to support local activities. In Y4, due to the difficult economic situation, the company did not provide the $700 annual allocation to each center that had previously been intended to support wellness activities.

New England GHCC WP "champions" were surveyed in January 2007 by their regional risk manager to learn about wellness activities implemented in 2006, and activities planned for 2007. Frequently reported wellness activities primarily focused on group walking, improving vending machine offerings, and massage chairs for stress reduction. Most of the programs engaged a relatively small proportion of their center workforces. A few programs were inventive and drew in a large number of participants, but they tended to be short-lived and without continuity. Frequently reported issues hindering wellness program efforts included cost, not knowing how to reach large numbers of employees, keeping employees interested, and lack of time. These findings, together with the administrator survey, informed site selection for focus groups and intervention sites for participatory health promotion programs.

The implementation and success of programs depended on a single wellness champion; if that person left or was no longer able to commit the time, the entire program floundered. Hence the total impact on health of that workforce might be rather limited. To test this, we compared questionnaire data between centers with and without WP activities.

Eight centers surveyed were in Maryland (MD) and 10 were in New England. Comparison of the 2 geographical regions showed marked differences in average body mass index (BMI) (over 70% overweight or obese in MD, vs about 44% in the New England centers) as well as in self-reported history of diabetes, hypertension, and serum cholesterol (all highest in the MD shore regions). Due to these notable regional differences, analysis of survey data regarding the effect of WP has been restricted to centers in New England: 3 with an active WP and 4 without. Respondents from the WP centers (n=248) were two years younger, on average, than those from non-WP centers (n=240) and more likely to be Hispanic (15% vs 3%), so multivariable analysis will be needed to address these factors. Crude mean BMI was slightly higher in the WP centers (28.6 vs 27.1) and SF-12 MCS was slightly lower (47.9 vs 49.2). Prevalence of current smoking was higher at WP centers (34% vs 28%), as was an assault at work during the past year (44% vs 32%). Workers at WP centers reported using resident lifting devices 'often' or 'always' to the same extent as in non-WP centers (58% vs 61%). There were only very small or no differences in any other health indicator or behavior, such as self-reported overall health, PCS, health self-efficacy, frequency of aerobic exercise, or musculoskeletal symptoms. Stated intention to leave the current job in the next two years was identical between WP and non-WP centers.

a. Physical ergonomic exposures

Physical exposures of nursing assistants at the 12 centers where observational data was collected were identified as centers with wellness programs or centers without wellness programs. Centers without programs had a steeper reduction in the frequency of resident handling activities over two years (Figure 18), and a steeper increase in the use of equipment

while resident handling (Figure 19). Non-wellness centers also had higher levels of baseline equipment use compared to centers with wellness programs.

Figure 18: Change in Frequency of Resident Handling Activities among Centers With and Without Wellness Programs
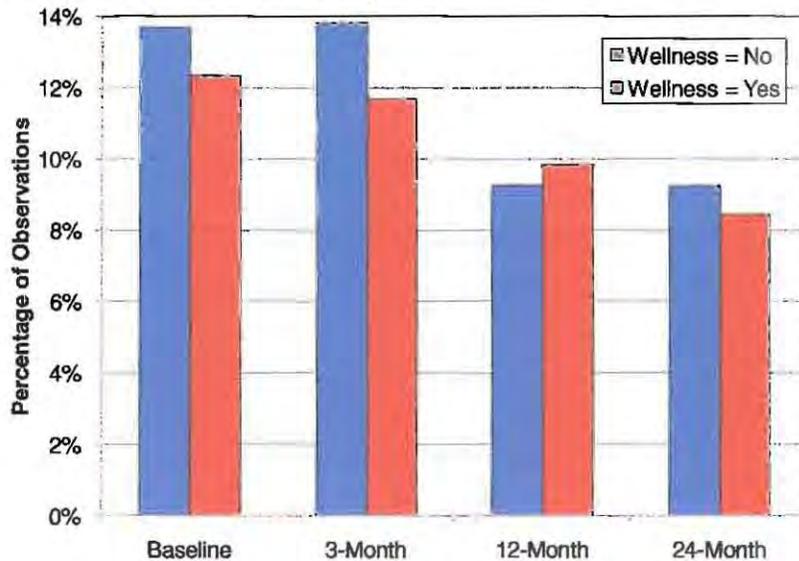
Figure 19: Change in Equipment Use While Resident Handling among Centers With and Without Wellness Programs
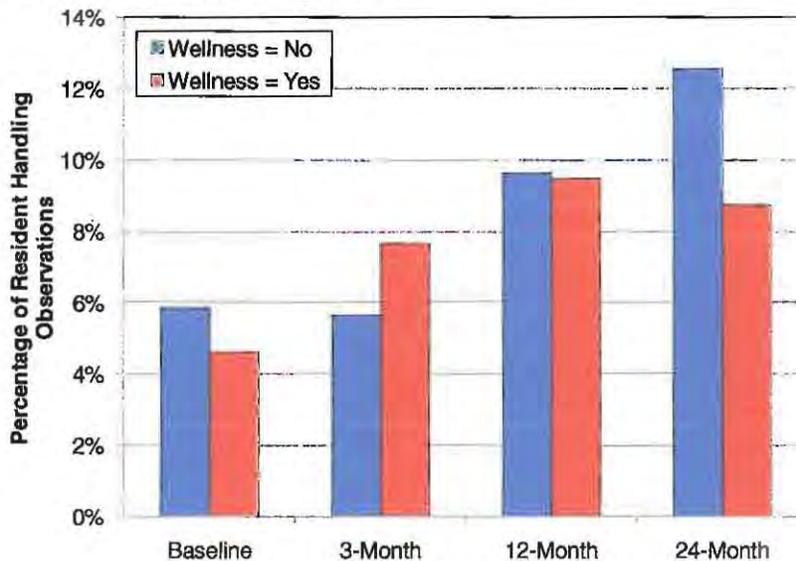
Compared to centers with wellness programs, those without wellness programs also experienced a steeper increase in working in neutral posture while resident handling (Figure 20), accompanied by steeper decreases in more severe bent and twisted postures; a steeper decrease in static standing (Figure 21) and a steeper increase in dynamic leg action; and a steeper increase in working with both arms below 60 degrees over the two year follow-up (Figure 22).

Figure 20: Change in Neutral Trunk Posture While Resident Handling among Wellness and Non-Wellness Centers

Change in Neutral Trunk Posture for Wellness and Non-Wellness Centers
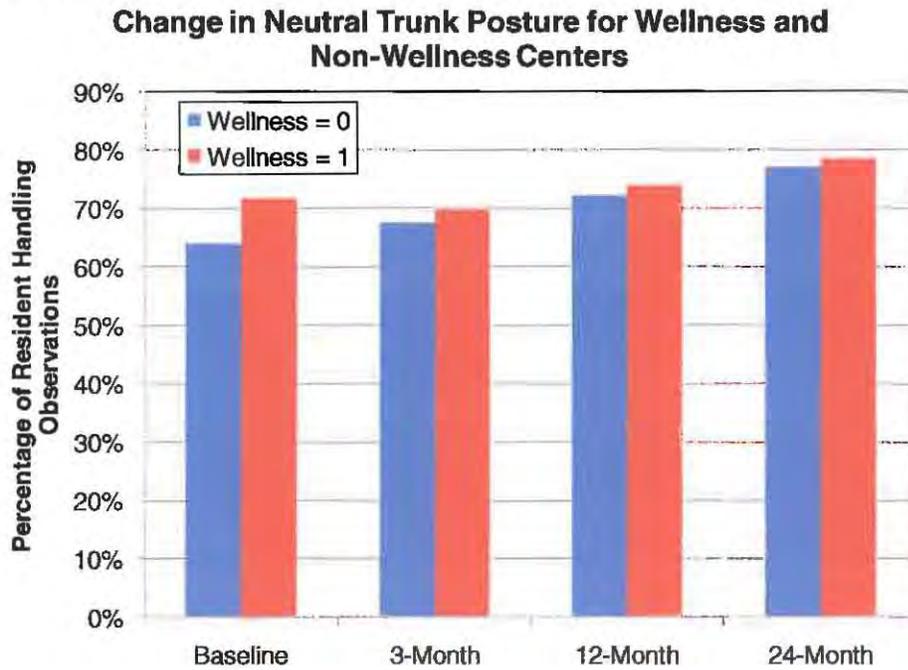
Figure 21: Change in Static Standing While Resident Handling among Wellness and Non-Wellness Centers

Non-Wellness Centers
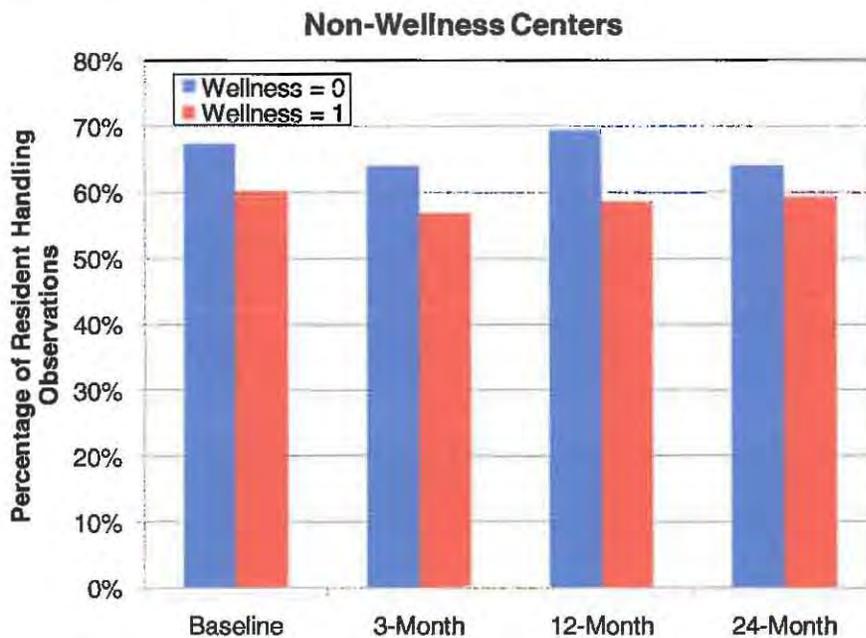
Figure 22: Change in Both Arms Below 60° While Resident Handling among Wellness and Non-Wellness Centers
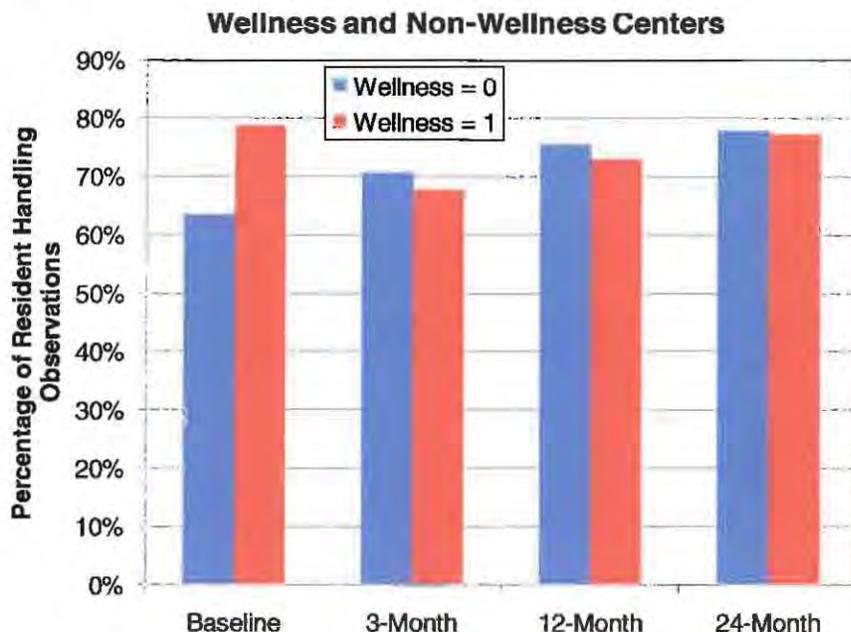
A possible explanation for improved postures in non-wellness centers is that some wellness centers may not have been actively using any handling equipment pre-SRHP, regardless of whether or not it was available. Facilities with wellness programs did experience a steeper increase in lifting the lightest loads (less than 10 pounds) and a steeper decrease in lifting the heaviest loads (greater than 50 pounds) over two years compared to non-wellness centers.

a. Psychosocial environment

In Y4, we classified 2 centers as having well developed wellness programs (at least three wellness activities, program champion and committee in place); 4 as having emerging programs (1-2 ongoing or recent wellness activities), and 7 as having no wellness program at all. Five centers did not respond to any of the surveys and thus could not be described. Regarding **working conditions**, both decision latitude and social support showed positive trends with level of wellness activity, with the highest means in centers with well-developed wellness programs and lowest means in those with none. There were no differences among groups in employee-rated job demands, physical exertion, or safety of the work environment. However, the centers with emerging wellness programs had a higher prevalence of having experienced 3 or more physical assaults by residents or their visitors within the last 3 months, compared to the centers with either no or well-developed wellness programs.

In Y5, perceived **working conditions** such as social support (coworker and supervisory), decision latitude, schedule control, and work-home imbalance were comparable across centers with different wellness programs while psychosocial demand (mean: 6.1 vs. 5.6 - 5.7) and physical exertion (mean: 12.9 vs. 11.6 – 12.2) were significantly higher in centers with well developed programs. Reported violent accidents within last 3 months were more prevalent among centers classified as having emerging programs (45.4%) and those with no information provided (42.2%) compared to those with none (34.4%) and well developed programs (34.4%).

b. Health-related Outcomes

In Y4 (well developed, emerging and no wellness programs) we used the F2 survey to compare health status by level of wellness program within the center. There were no differences in **body mass index** or **exercise** frequency among the three groups. **Smoking** showed the opposite association from that expected: the highest prevalence of current smoking (30%) was in the centers with well-developed programs. The proportions of participants who never smoked were 44%, 57% and 60% in well developed, emerging, and no programs, respectively. Consistent with this, smoking self-efficacy (defined as "avoiding tobacco products") was lowest in the group with well-developed wellness activities. All other health behavior self efficacy scores were similar among the 3 groups of centers. The amount of **stress in daily life** in the past 3 months was highest in the group with well developed wellness programs and lowest in the group with no wellness program (F value 4.47, p=0.01).

In Y5 (well developed, emerging and no wellness programs), **self reported physical health** scores were comparable across centers and were more favorable overall than mental health scores. Generally, mental health scores were low compared with the expected score of 50 for the overall population, with exception of centers which provided no wellness information (50.2). All self-efficacy items except smoking (avoiding tobacco products) were comparable among program levels. Overall, changes in health behavior within last 3 months were similar across program level. Amount of change in diet containing high fat content was less favorable among centers with well developed programs (2.1 vs. 2.4 -none/emerging, and 2.3 –missing). Centers with well developed programs had more favorable responses with respect to amount of sleep.

Body mass index varied from 27 (26.9) to 29, placing the average participant in the overweight category (normal > 25). The majority of respondents never **smoked** (64.6% - 80.0%) and more than half reported to **exercise** regularly (58.1% - 60.4%). The percentage of regular aerobic activity was lower in the centers without wellness programs. No differences were seen with respect to sleep quality.

c. Work outcomes: annual average turnover rate and intention to turnover

GHCC was unable to provide the dates of WP initiation at any centers, so turnover rates could not be examined specifically for pre- vs post-WP changes.

The F2 questionnaire data from all employees in 18 nursing homes were examined for cross-sectional covariates of stated intention to leave the current job at GHCC. Intention to leave was measured with a single item, "I am likely to leave this job in the next two years." This was assessed with a 4-point Likert scale (strongly disagree; disagree; agree; strongly agree). A working condition index was constructed that represented the number of beneficial psychosocial job features endorsed, using four survey items: coworker support, supervisor support, receiving respect at work, and decision-making opportunity; this was scored in five levels (exposure to 0, 1, 2, 3, and 4 factors). A total of 598 participants (37.6%) reported any intention to leave their jobs in the next two years and 194 (12.2%) reported a "strong" intention to leave, with increased probability among workers younger than 40 years and older than 60 years. Multivariable modeling showed that employees who reported four beneficial job features were 77% less likely to state strong intention to leave (PR=0.23, p<0.001) (Table 2). The strength of this relationship between working conditions and intention to leave was only slightly mediated by mental health (SF-12 Mental Component Summary).

Table 2. Poisson log regression modeling results of strong intention to leave among 1589 nursing home employees. Adjusted for age, race, marital status, job title, and shift work.

Working Condition Index	Prevalence Ratio	95% Confidence Interval
0 (reference)	1.00	--
1	0.70	0.42-1.17
2	0.47	0.28-0.80
3	0.28	0.16-0.48
4	0.23	0.14-0.39

In Y4, stated intention to leave was examined in centers with well developed, emerging and no wellness programs. The F2 questionnaire data indicated that between 30% and 40% of participants reported intention to leave the job within next two years (combined "agree" and "strongly agree"). The prevalence was highest in the group with no wellness program and lowest in the group with well-developed programs.

Aim 2 – Discussion and Conclusions

Analysis of physical ergonomic exposures seemed to indicate that centers without wellness programs had more improvements in body postures following the SRHP. However, decision latitude and social support showed positive trends with a center's level of wellness program activity. Intention to turnover was also lower in centers with well-developed wellness programs. Differences between wellness and non-wellness centers were negligible for many other general and personal health factors.

The lack of effectiveness of the GHCC WHP programs is probably explained by the low level of institutional commitment of resources. The primary regional office contribution is to generate regular mailings of informational materials to each center. The regional staff lacked systematic knowledge of the status of WHP programming in the various centers.

Even though the cross-center comparison between those with and those without wellness programs gave us a certain perspective upon the impact of the corporate-wide wellness programs on change of center environment and employee health and safety, aspects such as center baseline differences on management style, work environment and other organizational factors cannot be ruled out. In addition, the centers were divided based on the number of current wellness programs, but the participation level of the wellness programs in each center was not reported.

A possible explanation for more improved ergonomic postures in non-wellness centers is that some wellness centers may not have been actively using any handling equipment pre-SRHP. In addition, the corporate-wide wellness programs were focusing on individual health promotion such as weight loss, exercises, and stress relief, which were not necessarily associated with safe resident handling behavior change.

Aim 3. To design, implement and evaluate a participatory health promotion program (PHP) in a selected number of facilities, and to describe the site and group characteristics (structures, group dynamics, manager support, etc.) associated with successful initiation or inhibition of a program.

Between May and September, 2008, participatory health promotion/health protection interventions were developed at 3 long-term care centers. The key activity was researcher-initiated "Health and Wellness" teams of non-supervisory workers from various departments. Three control sites with robust management-led health promotion or wellness programs at the beginning of the study were located in ME, RI, and MA. Both sets of centers were assessed in 2007-8 at the beginning of the study, and again in 2010 and 2011. Assessments included management interviews, worker focus groups and individual worker interviews.

Intervention Site Selection

A site selection process, conducted at 5 nursing centers in 2007, consisted of interviews with the administrator and director of nursing at each site to determine their interest in the program, their concerns about health promotion and occupational health, their interest in increasing worker participation, and their willingness to have the team address organizational and psychosocial issues. One center was eliminated after this phase due to lack of tenure at the center and a lack of interest in being involved in change.

The second phase of the selection process was a series of focus groups conducted with CNAs from different shifts and units, who were representative of the center demographics. Two 2-part focus groups were held at each center, 28 in all, with each session lasting 90 minutes.

Management interviews and worker focus groups were also conducted at the 3 control sites to gain a better understanding of the centers. Focus group questions were similar for prospective intervention and control sites, addressing workplace and general health issues, sources of stress, organizational factors impacting health and the effect of a no-lift program implemented by GHCC two years before. Prospective intervention sites were asked to envision the ideal nursing home to establish a sense of vision for each group. Control sites were asked to describe their health promotion programs – successes and improvements that were needed.

Focus groups at all sites provided rich data about staff health concerns that echoed the questionnaire responses. Work organization and health issues were described similarly at all centers, with stress and an interest in healthier eating as major concerns. Stress was typically related to understaffing and lack of nursing support, although a few participants stated that they found less stress at work than at home. Many participants were caring for children or grandchildren, plus sick spouses or aging parents. Participants consistently described ideal staffing as 5-6 residents per CNA; the current load is 8-12 residents per CNA. Poor communication between CNAs and nursing staff was reported by most groups. Suggestions for stress reduction included a relaxation room, more respect from supervisors, better teamwork and improved communication. An interest in improving the lives of residents emerged in most centers, not only for its own sake but to reduce stress in the work environment as well. Suggested exercise opportunities included an on-site exercise room, walking groups, martial arts, and subsidized gym memberships. Participants wanted healthier food choices on site, such as healthy meals or a salad bar at low cost provided by the center's kitchen and healthier choices in vending machines.

Additionally, the qualitative evaluations showed that the organization of the work environment in these centers was perceived by nursing assistants to conflict with comprehensive care. Short staffing, poor communication, and a generally disrespectful climate all contributed to CNAs feeling rushed and unappreciated. As a consequence, they believed, the residents did not

receive the quality of care that they deserve, and the CNAs themselves felt disrespected. Both of these consequences caused distress for direct care providers and contributed to feelings of failure in their job roles and self-described stress and mental health problems.

An online survey for facility administrators was developed and launched to assess organizational climate within GHCC nursing centers and to identify issues of concern to them, including occupational health, stress, other psychosocial stressors, personal health, and work organization (Appendix A-3).

Intervention Implementation

In Yrs 2 and 3 (May- Sept. 2008), participatory "Health and Wellness Teams" (HWTs) consisting of workers from various departments were established at the three selected nursing centers: Center A (Westford House, Westford, MA), Center B (Sutton Hill Center, N. Andover, MA), and Center C (Heritage Hall North, Agawam, MA). Originally the teams met every 2 weeks for 1 hour, with 6 to 10 members per center. The team at one center (A) now meets monthly. Over time all centers experienced some member attrition and engaged in actively recruiting new members, particularly CNAs. Teams which included CNAs and housekeepers tend to be more active and enthusiastic.

Initial team meetings involved identification of key issues in workplace health, organizational issues, and issues with residents. Identified issues largely mirrored the data from the focus groups at these centers. Health issues revolved primarily around nutrition and exercise. Suggestions included healthier food at the center, "real food" in vending machines, walking tracks, coaching for emotional issues, nutrition, exercise and fitness, weight loss. Occupational health issues included the need for more lifts at one center, problems pushing wheel chairs on carpeted floors, concern about infectious disease, strains and pains. Organizational issues included better communication, a floating pool of workers to fill in for short staffed areas, better teamwork, more appreciation from management, an organized community support network of volunteers. Short staffing and double work ranked highest as a cause of stress, reflecting the results of focus groups and questionnaires. Supply shortages and lack of storage were issues at all centers.

Over time, all teams moved from addressing relatively straightforward health issues to tackling more complex organizational issues such as lack of communication, lack of respect, and lack of teamwork that contribute greatly to stress and related health concerns. Proposal development was a major new skill set. Initially team members were afraid to approach management on their own. Developing a written outline that described the project and its goals, benefits to center employees and residents, cost estimates, and time frame produced positive results and gave them more confidence. Team activities included participatory, problem-solving training on healthy backs, a vegetable garden, food preference survey, plan for farmers market, fresh food in vending machines, fresh fruit bowls for staff, healthy snacks, employee mailboxes, discussions, surveys, planning to identify root causes of poor communication and incivility; plan to improve communication within center, team-run suggestion box, yoga, walking competition, Great American Smoke-Out, and chair-based massage.

Activities have included a staff garden to provide healthy food, exercise, and build teamwork; redesign of a break room to make it more restful and inviting, exercise programs, weight loss and nutritional education programs, food preference surveys, outside tables to provide quiet and stress relief, a healthy back training program, and surveys to identify communication issues. All teams have taken more ownership of their program over the years – planning and initiating programs on their own. They have begun to address work organization through plans for

improving communication – an implicit code word for lack of respect, lack of teamwork, and lack of input.

Team skills-building accrued through discussion/ demonstration of problem-solving, root cause analysis and feedback of data from surveys including ProCare reports to Genesis HC Corporation (Appendix A-4).

Intervention Evaluation

The intervention was evaluated in a number of ways including:

Worksite Readiness Checklist Instrument

A worksite readiness checklist (**WRCL**) was designed to assess characteristics of a workplace that are likely to influence or reflect effective health promotion program development and implementation. This instrument was of interest to CPH-NEW investigators for its possible value in quantifying organizational readiness for implementation of a worksite health promotion program, and as a means to reduce the lengthy site selection process that was used to recruit intervention sites for the participatory health promotion program. The WRCL has two components, each with a possible maximum score of 100. Part I is the managerial interview (WRCL-INT), which has four domains: health promotion (*hp-30*), organization (*or-32.5*), health & safety (*hs-23.5*), and supervisory (*sp-14*). Part II is the observational assessment (WRCL-OBS), which has three domains: physical environment (*pe-52.5*), general working conditions (*wc-24.5*), and safety environment (*se-23*).

The WRCL was pilot tested in the six nursing homes participating in the wellness comparison study—three intervention centers discussed above (implementing participatory health and wellness teams) plus the 3 centers serving as controls (implementing traditional company-sponsored health and wellness activities) [38]. Two trained observers toured each center together at the same time, each completing the WRCL-OBS instrument. Observers then interviewed the nursing home administrator using the WRCL-INT instrument. Administrators were also offered the option of completing the WRCL-INT survey independently. Two additional managers who were deemed by the administrator to be knowledgeable about health and wellness activities of the center completed the WRCL-INT survey as a self-administered questionnaire.

Scores for WRCL-INT for control sites were *hp:12.5, or:13.7, hs:16.8, sp:4.5* and for intervention sites were *hp:7.8, or:9.3, hs:16.4, sp:4*. The administrator interviews in the control centers reflected knowledge of or commitment to health promotion, as well as organizational flexibility, an expected finding. Except for general working conditions, WRCL-OBS scores in control and intervention centers differed little (control sites *pe:27.1, wc:7.5, se:15*; intervention sites *pe:28.3, wc:5.3, se:14.3*). These post-hoc comparisons suggest that the WRCL may capture some relevant features of employer health program activity.

Perceptions of caregivers and managers about employee health

We utilized qualitative data to compare perceptions between caregivers (focus groups) and managers (interviews) concerning occupational health and safety, work organization, and psychosocial concerns. Some common and some differing issues were identified. Both groups agreed on the importance of ergonomic concerns, the high prevalence of stress, and receptiveness to participatory health promotion programs. However, numerous work organization issues, physical and psychosocial workplace hazards, identified by nursing assistants, were not mentioned by managers. Both common and different opinions were voiced between nursing assistants and managers on opportunity for staff suggestions and follow up, staff participation and involvement in decision making. However, issues identified by nursing assistants on workload and staffing, work schedules, communications, teamwork, as well as respect and appreciation, were not examined by managers or were expressed in an opposite way by managers. The results suggest that different perceptions naturally arise from people's

different positions in the occupational hierarchy and their consequent exposures to health and safety hazards. Improved systems of communication that allow front-line workers to express their concerns would make it possible for ways to solve these problems.

Participation and Process Evaluation

As shown in Figure 23 (a, b, c), Center A started out with strong participation; at least four people attended meetings for the first 6 months. The next 5 months saw varying meeting attendance (2 – 9 team members), followed by nearly one year with only a couple of meetings.

Team attendance picked up again in June of 2010, though meetings were not regular and consisted of 2 to 5 members attending. Over 2 years, Center B had fairly regular meetings, though typically with 2 to 5 participants. Meetings at Center C were not regular at first, but after a few months 5 to 6 people were attending meetings for about 4 months. After a 4 month break, Center C began to have regular meetings most months with 2 to 9 team members attending.
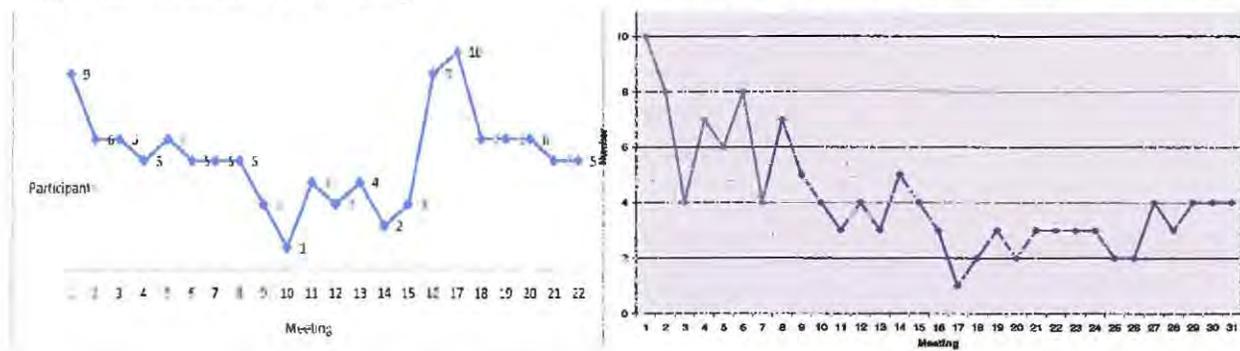
The research team systematically tracked various indicators to document the implementation of the participatory health promotion program. At each health and wellness team meeting, members sign an attendance sheet, minutes are kept, and research team members keep a log to note the salient aspects of the participatory process that are not on record in the minutes (degree of ownership for team activities, follow through on assignments, role of researchers as resource people vs. team members, etc.). Researchers have also worked with HWTs to assure that participation is tracked in all wellness activities sponsored by the teams. Researchers also worked with HWTs to assure that center-wide employee participation is tracked for all wellness activities sponsored by the teams. The logs of activities are periodically sorted by topic to analyze the overall flow of the project.

Interim evaluation

An interim evaluation of the three intervention sites and of three control sites was conducted in summer and fall 2010 by an outside evaluator with UML staff (Appendix A-5). HWTs participated in a self-evaluation group interview. Interviews were conducted with center administrators and key management personnel who might impact the program at intervention sites. The intent was to identify program strengths and weaknesses and to find ways to increase impact.

Control sites had mature health promotion (wellness) programs at the beginning of the grant. This evaluation was intended to see how they had progressed on their own over the past two years. The administrator, wellness committee members, wellness "champion" and/or activists were interviewed at each site. The evaluation revealed more robust programs at the intervention sites, with more activity aimed at internal issues and concerns. Only one control site still had a wellness committee, but it had not met in months. Two activists at another site recruited co-workers to participate in a state-run weight loss and exercise program and in an annual Alzheimer's Walk with excellent participation. Another center had no real health promotion programs and limited activities to improve morale to employee recognition programs.

Content analysis was performed using NVivo software on transcripts from interviews and self-evaluations. Themes were highlighted in several domains, including center health promotion activities, the safe resident handling program (also known as no-lift program), worker participation, work organization and work stress, and design ideas for future health promotion programs. Challenges and motivators were identified.

Challenges at all sites include difficulty in staff getting time off for HW activities or meetings. This means that office personnel are the primary participants at 2 centers, since their schedules are more flexible. It is considered critical to build participation of clinical staff in particular, plus housekeeping and dining services staff. Staff hours had been cut at five of six centers, making participation more stressful. Perceived lack of management support was a major obstacle at different times at the intervention sites, leading to frustration. While intervention site programs are much more active than controls, sustainability of these programs is not assured. Lack of funding was a major challenge. One group had to raise money to buy lawn furniture that would provide a relaxation area for workers.

Year 5 Evaluation

Qualitative evaluation of intervention and control sites was conducted by an independent evaluator in summer of 2011. Interviews were conducted with top management and selected middle management at each site to determine their knowledge and support of HW or wellness programs. Focus groups of a representative range of workers assessed the impact of HW and Vor wellness activities on workers and on the center as a whole. Workers were asked what kinds of activities or issues they would like to see addressed. At intervention sites, each HWT was interviewed as a whole and individually to determine their assessment of the program, its challenges, successes and prospects for the future. At control sites, wellness champions and activists were interviewed. A committee that mainly consists of managers and handles employee recognition was interviewed at one control site.

Factors that encouraged, enhanced, or motivated program success included leadership, the role of the Wellness Champion, resources, staff, time, communications, organizational culture, organizational structure, and a consistent team. Challenges to program success primarily focused on lack of leadership support, the role of the Wellness Champion, resources, communications, organizational structure, resources, time, stress, and the lack of a consistent, coherent team.

Success was defined as a program with a participatory structure, an ability to integrate OSH with HP, and the ability to create changes at the facility. Indicators of sustainable participatory HWTs included: leadership support (from upper and middle management, an active wellness champion, resources to implement projects, staff with time to dedicate to team activities or to plan and implement projects, a moderate level of stress, time to participate, communication between management and team, and team with co-workers, stable workforce, organizational structure and culture, an active team that is representative of center departments and demographics.

The full evaluation report is included as Appendix A-6.

<u>Aim 3 – Discussion and Conclusions</u>

Group stability after initiation

Lack of time and short staffing present a serious challenge. We have observed in each of our teams that motivation and effort is high for a period of time, followed by period of low attendance and low spirits. Team members may feel overwhelmed by additional duties at work or may not be able to get time off to take care of team responsibilities. Flexibility in scheduling meetings according to the availability of the workers, as well as arranging for upper management to be present at portions of committee meetings seems to have been effective for improving attendance at team meetings.

Program scope (health protection, health promotion, work organization

Many programs implemented by HWTs were straight forward health promotion – walking and weight loss programs, smoking cessation, temporal stress reduction (massage, yoga). A number of projects, however attempted to change the working environment to create a more health-promoting workplace. These included healthier food options at all facilities through vending machines or through dining services. Employees at all 3 centers wanted healthy sandwiches or wraps, salads and soups. In B and C, worker areas for relaxation were addressed – through redesign of an uninviting break room and purchase of outdoor tables at C and through development of an outdoor relaxation area at B.

Effectiveness of integrating OSH and WHP

We define integration of health promotion and health protection as projects or activities that address more than personal health that affect the structure, environment or organization of the workplace and/or increase the influence of workers on their workplace (Figure 24, next page). Projects carried out by the HWTs are listed in Table 3 in terms of whether they addressed single domains or were at least partially integrated in their intervention targets.

Focus group results provided additional support for our working assumption that interventions aimed at both work and home risk factors are likely to impact health more than targeting only one domain. Further, there was marked concordance with the information obtained from center administrators and wellness champions, implying that there is a common assessment of risk factors which can be targeted by the upcoming intervention process. The focus group experience also supported the feasibility of employing a participatory approach in which workers identify and prioritize specific health hazards, whether physical (e.g., heavy lifting) or organizational (time stress), and are empowered to work with management to address these issues.

Labor-management cooperation

In at least two centers, well-meaning managers repeatedly failed to follow through on tasks they promised to complete, which delayed implementation, leaving team members frustrated. Part of this challenge stems from a gap in not having formed a manager level "steering committee" as part of the intervention. The decision not to create a management level committee was taken based on the relatively flat organizational structure of the nursing homes. Without this structure in place, health and wellness teams struggle to fill in the roles for communication needed to generate budgetary and staff support for some of activities, particularly when working with departments that are not represented on the team.

The sometimes glacial pace of response from management's initial approval to final implementation was frustrating to all teams and resulted in low morale. Investigators were usually successful in restoring enthusiasm, but unless this process of implementation can be streamlined, it is uncertain how well the teams will survive. Turnover of two administrators

temporarily slowed team development. The new administrator at center C has been extremely supportive, however, in Y4 providing a budget of $3,600 for health and wellness activities.

Figure 24. Overview of Integration of OHS/WHP in participatory ProCare teams

Wellness Team

HEALTH PROMOTION ⟷ **ORGANIZATIONAL STRUCTURE** ⟷ **HEALTH PROTECTION**

HEALTH PROMOTION
- Exercise
- Nutrition
- Health Education
- Smoking Cessation

ORGANIZATIONAL STRUCTURE
- Decision Latitude
- Communication
- Employee Support
- Working Environment
- Employee Support
- Recognition
- Health Education/ OHS Training
- Teamwork
- Financial Support
- Flexibility of Jobs
- Scheduling Jobs/Rotation
- Management-Worker Interaction
- Administrator-Team Interaction
- Management Support

HEALTH PROTECTION
- Stress
- Communication
- Ergonomics
- Work Environment
- Employee Support
- Chemical, Safety, biological hazards
- Teamwork

| Table 3. Intervention Activities by ProCare Health & Wellness Teams				
Single-Domain		**Integrated**		
Individual/ Personal Health	**Health Protection**	**Health Protection/ Work Organization**	**Health Protection/ Environmental Improvement**	**Health Promotion/ Work Organization**
• Weight loss • Exercise • Smoking cessation • Nutrition or health information • Stress relief - massage	• Ergonomics training as a stand-alone program	• Ergonomics training with development of ergonomics facilitators *(Builds empowerment, protects workers, changes work organization)*	• Garden *(Vegetables go to all employees. Requires ongoing teamwork and commitment)* • Break room designed by HWT • Quiet areas for workers to relax	• Sandwiches and salads from dining services at greatly reduced rate • Permanent change in center policy • Healthy vending machines • Develop new systems of communicating critical information to reduce stress, improve work environment

Aim 4. To compare the effectiveness of the WP and the investigator-initiated PHP program with regard to participation levels, health and/or work outcomes.

a. Program scope, worker participation and engagement

Dr. Stuart Robertson analyzed all transcripts from the Year 5 evaluation data using nVivo© , a qualitative analysis software program. In addition to identifying major themes, he calculated the number of times that specific themes and occurred during interviews and focus groups. In Figures 25 and 26 "individual health initiatives" refers to unidimensional health promotion, while "environmental stress" (stress caused by work organization, psychosocial stress, etc.) indicates a more integrated approach. The frequency of discussions of individual health initiatives was evenly distributed between controls and intervention sites (Figure 25). In contrast, 79% of all discussions of projects addressing environmental stress occurred at intervention sites, compared to 21% at control sites (Figure 26). This is a strong indication that management and workers at intervention sites were more aware of and involved in integrated health promotion/ health protection approaches.

Figure 25: Frequency of Individual Health Initiative topics discussed in interviews and focus groups at Intervention (PHP) and Control (WHP) Sites

Individual Health Initiatives

- C-1 (Control)
- C-3
- C-2
- I-1 (Intervention)
- I-2
- I-3
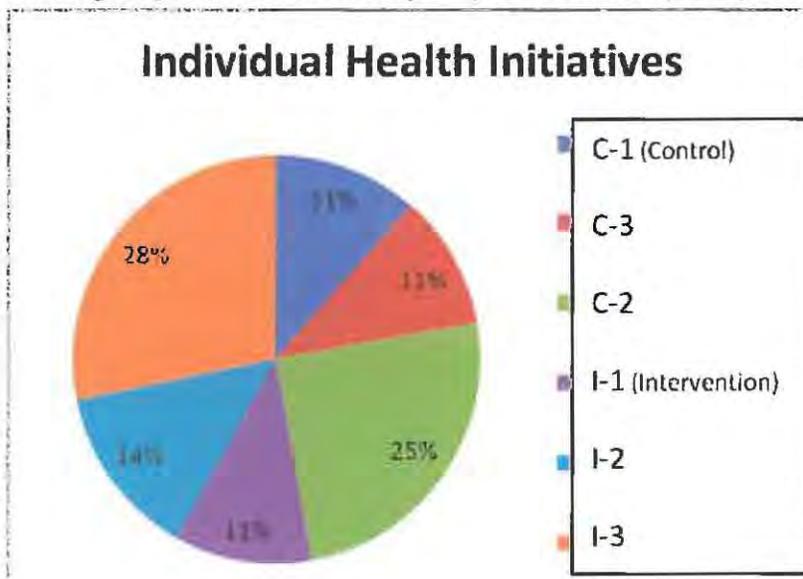
Figure 26: Frequency of Environmental Stress topics discussed in interviews and focus groups at at Intervention (PHP) and Control (WHP) Sites

Environmental Stress

- C-1 (control)
- C-3
- C-2
- I-1(intervention)
- I-2
- I-3
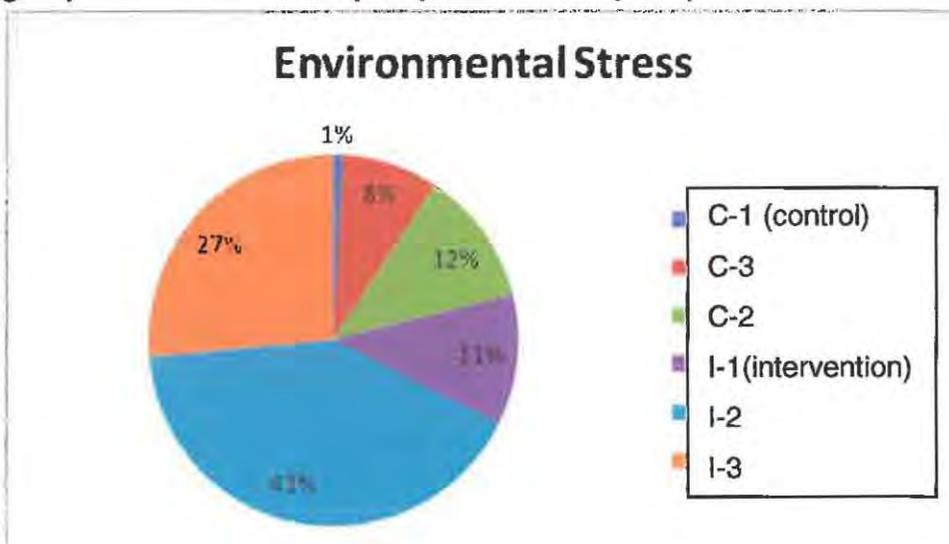
Activities at control centers focused entirely on individual health – exercise, weight loss, and stress reduction (massage). Wellness committees no longer existed or were non-functional at two centers (RI and ME). The MA control site had a committee of managers who primarily addressed employee recognition and occasionally sponsored a wellness program. The only consistent control site activity was "Shape-up Rhode Island," a university-sponsored state-wide program. Employees participated outside of working hours and competed in teams for the best participation and improvement. Employees at the center organized participation, but all wellness participation was external.

At the intervention sites, teams functioned fairly consistently over the three-year follow-up period. Although membership fluctuated, a core of 3-4 members was maintained in each team. All HWTs attempted to implement both health promotion and integrated activities, many of which were targeted at changing the environment of the workplace. All HWTs introduced healthier food choices at the center, either through vending machine or through food provided by dining services. Changes in center organization, which included expanded short-term (transitional) care units (TCUs) or conversion of a TCU to cardiac care recovery units, often created problems with communication of necessary information, resulting in increased stress and additional work. Two HWTs attempted to address this problem. At center B they were told that management was "already working on a solution."

It is difficult to quantify participation in the intervention programs. While none of their efforts equaled the participation in the RI state-wide program, they had many more activities, with many aimed towards changing the center organization or environment, resulting in benefits to all. These included developing places for staff to relax and escape the pressure on the floor, as well as having healthier food choices available to all. Projects such as the garden at center A has continued over 4 seasons and has built increasing participation and support. Center A started a Biggest Loser program through its dietitian, who included nutritional information and exercise as part of the program. Management allowed staff 15 minutes breaks to attend the meeting. Participants were given homework assignments to access healthfulness of food in their homes. In HWT meetings and Year 5 evaluation, employees at all levels expressed support for the program and that it seemed to change people's awareness of food. As a result of the program, weekly staff appreciation offerings moved from typical chips and dips to fresh fruits and hummus because of new awareness by the GNAs responsible for buying it. This contrasted with the Biggest Loser programs promoted through a corporate initiative in which there was no direct education and no time off for participants to meet and build solidarity.

Survey questions to measure employee satisfaction with and perceptions of the center wellness activities were developed and included in questionnaires distributed to intervention and control sites in 2010. Questions were designed to assess program awareness, program participation, and the reach and effectiveness of the program, and perceived changes. At all 6 centers, respondents identified exercise (19-30%), more sleep (14-26%), having more energy (12-20%) and weight loss (11-20%) as the health improvements they sought in the next 2-3 years. They reported the following conditions diagnosed by their health care provider: overweight (64%), high cholesterol (19%), hypertension (18%), low back problems (12%), and high blood sugar/ diabetes (8%). When asked about their health habits, 24-26% at intervention sites and 15-22% at controls indicated they were eating healthier food, 12-24% had improved physical fitness, and 11-14% had reduced their stress levels. When asked for recommendations for future programs, exercise/ fitness activities, stress relief programs, and weight loss programs were indicated as the top three choices at all centers.

Barriers to participation in wellness activities at all 6 centers included: job duties kept them from participating (17%), other responsibilities kept them from participating (15%), and activities did not meet their needs (13%). HWTs have reviewed the data in prepared handouts (Appendix A-4) and are discussing ways to address the needs of their centers.

Lack of recognition of efforts often resulted in team demoralization. Administrators at all six centers expressed support for health promotion (wellness) programs, worker health and safety, and increased worker participation. Administrators at control sites were viewed by workers as supportive of wellness and open to worker suggestions. At intervention sites, where we had closer and ongoing contact with administrators, their stated intentions did not always reflect their practice.

Although one of the selection criteria for intervention sites was a stable work force, this changed in Year 5. At center A, after a new administrator took over, there were firings and resignations, with about 12 new employees a month. This put additional strain on front line workers, particularly in clinical services, making it extremely difficult for workers to get off the floor or even to hold HWT meetings. There was pressure to decrease the numbers of meetings and committees.

b. Physical ergonomic exposures

Differences in physical ergonomic exposures were compared between intervention (PHP) and control (WP) centers at F4, since this is the only time period data was collected for these sites. There was no difference in the frequency of resident handling activities and use of equipment while resident handling between the intervention and control centers. While resident handling, the intervention centers worked significantly more frequently in neutral trunk postures (Figure 27) and with both arms lower than 60 degrees (Figure 28). Intervention sites also lifted lighter loads than the control centers (Figure 29). However, the control centers worked more frequently in dynamic leg action as opposed to static standing (Figure 30) compared to the intervention centers.

Figure 27: Trunk Posture While Resident Handling (36-Months)
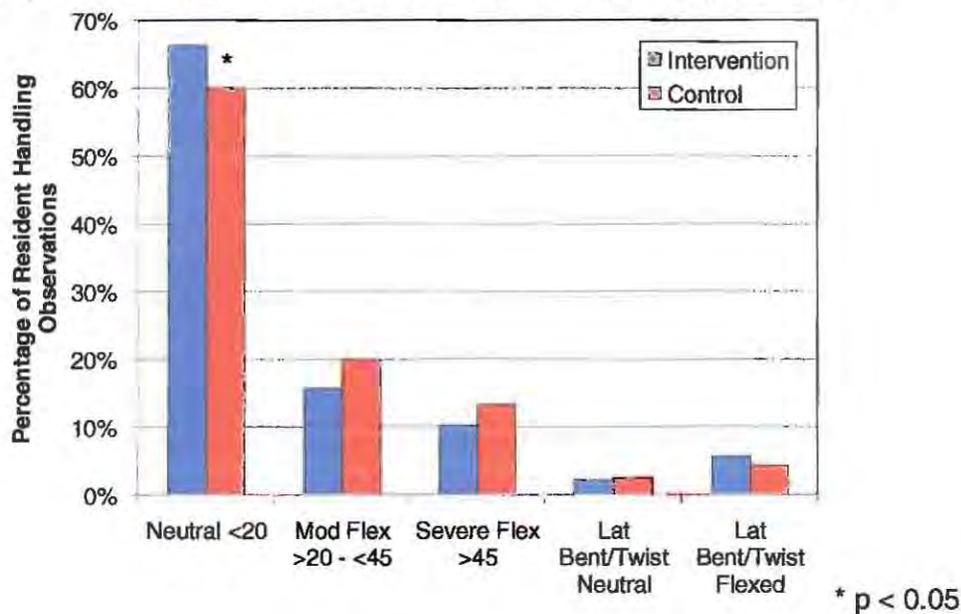
Figure 28: Arm Angle While Resident Handling (36-Months)
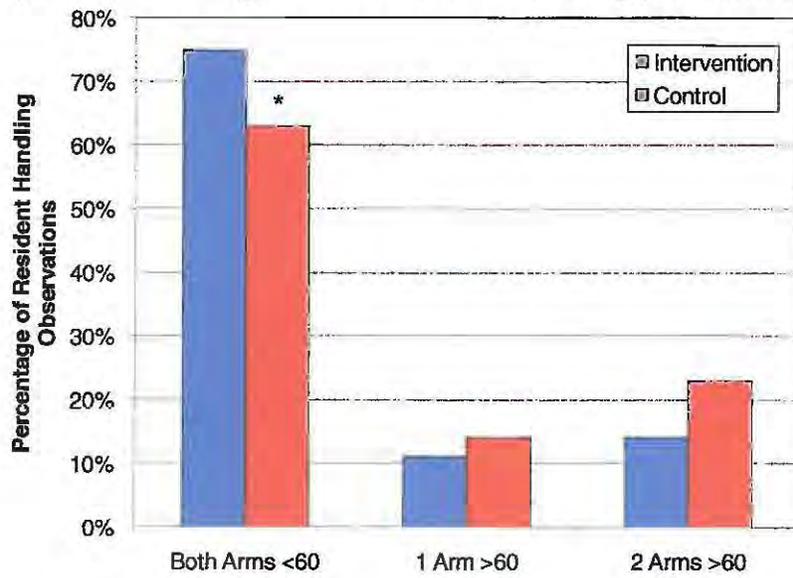
* p < 0.05

Figure 29: Weight in Hands While Resident Handling (36-Months)

Figure 30: Leg Action While Resident Handling (36-Months)

c. Psychosocial environment

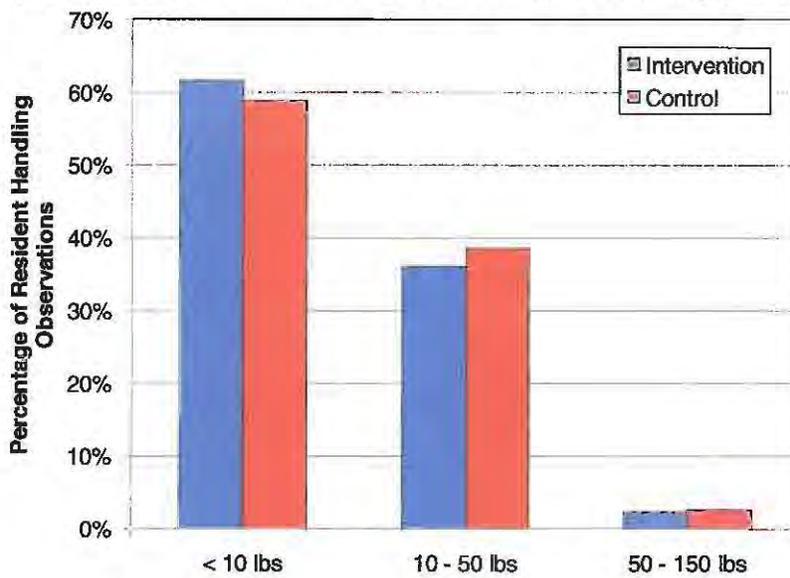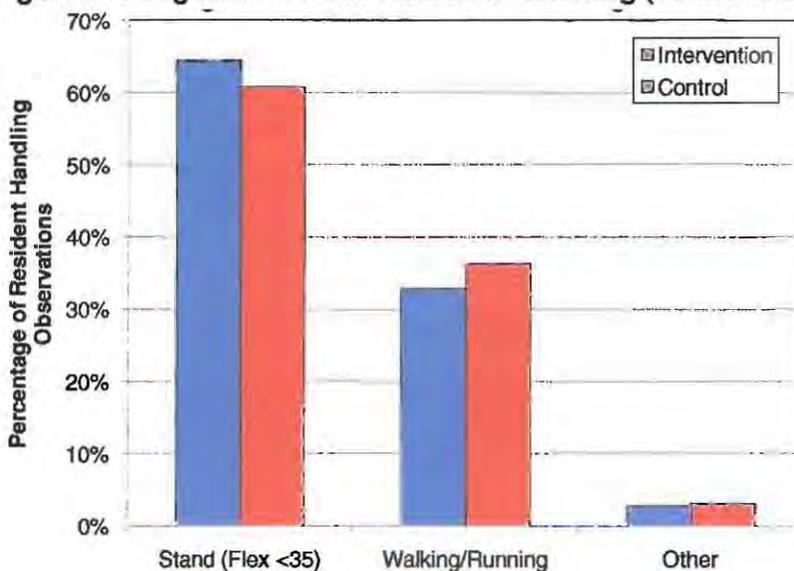Nursing homes are inherently stressful workplaces, with limited staff dealing with the many needs of residents. This has been exacerbated recently by reductions in Medicare reimbursement rates. Corporate policy seems to be more oriented towards the bottom line, creating stress for administrators, managers, and workers. This has resulted in layoffs, decreases in hours for all employees at some sites and for office staff at Center B, with as much as a 20% cut in hours, along with increased job duties. The perceived precariousness of their positions has resulted in increased stress and reluctance on the part of front line workers to speak out about desired change or to take time off the floor to attend meetings.

Quantitatively, questionnaire responses from the 3 intervention centers were compared to data from the 3 control centers which had prior corporate-wide wellness programs. The participatory health promotion programs linked occupational health and health promotion by addressing both individual health behaviors and work organization conditions. The corporate-wide wellness programs primarily focused on weight loss and maintenance, physical exercise, and stress reduction. The hypothesis was that the intervention centers would have better health indicators and working conditions, as a result of combined intervention programs.

In the F4 survey, questionnaire responses from the three intervention centers and three control centers were examined with regard to **workplace conditions**. There were negligible differences between control and intervention sites in psychosocial demands, decision latitude, supervisor support, coworker support, physical job demands, frequency of workplace assault, perceived schedule control, and work-family imbalance. The latter two scales indicated a substantial impact on workers' lives, with nursing staff at control centers reporting more control over their schedule and better work-family balance. At two centers, 20-30% of workers reported experiencing at least 3 assault incidents in the past 3 months. Employees at intervention and control sites reported slightly different social support (11.3 vs. 11.7); psychological demands (5.8 vs. 5.6); and control over work schedule (5.1 vs. 5.4).

b. Health-related Outcomes
Workers' Compensation Claims

Complete information regarding workers' compensation claims and annual average workforce size for the entire SRHP follow-up period (pre- and post-) was only available for two of the intervention and two of the control centers. One of the intervention centers was missing workforce data for one year pre-SRHP, and the full three years of follow-up data was not available for one of the control centers. For the remaining four centers, one intervention and one control site had reductions in claims rates post-SRHP, while one intervention and one control site had slight increases in claims rates. In this small sample, it does not appear that the type of wellness program impacts claim rates at centers.

Musculoskeletal Symptoms

In Y3 the highest prevalence of **musculoskeletal disorders** was for back conditions, followed by knee and shoulder disorders. There was no clear trend between the intervention and control groups; the highest prevalence of back disorders was seen in one control (C3) and one intervention (I2) center.

Self-Reported Health and Behaviors

In Y3, it was hypothesized that **control centers would have better health indicators**, as a result of their previous wellness activities. Questionnaire responses from the three intervention and three control centers collected during the 12-month follow-up survey were examined.

The prevalence of self-reported **chronic disease** history was generally higher in the control centers. Hypertension and elevated cholesterol were the most prevalent chronic conditions, with hypertension reaching the highest peak in C3 and cholesterol in C2. A majority of the staff are never-smokers (38%-70% by center). The average **body mass index** (BMI) at all facilities was in the range of 26-28, implying that a majority of these clinical nursing staff is overweight. Average BMI was very similar among the wellness and intervention centers. The lowest average BMI value was seen in control site C3 (26). Over 80% of staff members at each center reported preparing their main meals at home.

Overall, **self reported health** was rated more favorably in the intervention centers as compared with control centers. Staff members in the intervention centers were more likely to report being in "very good" health (prevalence 35-45%) and less likely to perceive their health as "fair," whereas those in control sites were more likely to rate their health only as "good" (prevalence around 40%). Notably, the physical health component scale was almost uniform across the 6 centers and more favorable than mental health. Mental health varied more and tended to be slightly higher in the control centers.

Current **smoking** was more prevalent in the control centers. Two of the intervention sites and one control site had more former than current smokers. In terms of reported frequency of aerobic **exercise**, staff members at one control center (C2) appeared to be more active than at all the other centers. Almost 60% of these respondents said that they exercised once or more per week, compared to 40%-45% at the other sites.

c. Work outcomes: annual average turnover rate and intention to turnover

Intention to turnover

At F4 (Y5), aides and other direct care workers expressed less **intention to leave** the job in control sites than in intervention sites. Similar results were not noted for other employees.

Figure 31: Intention to leave between control sites and intervention sites at F4

Intention to Turnover
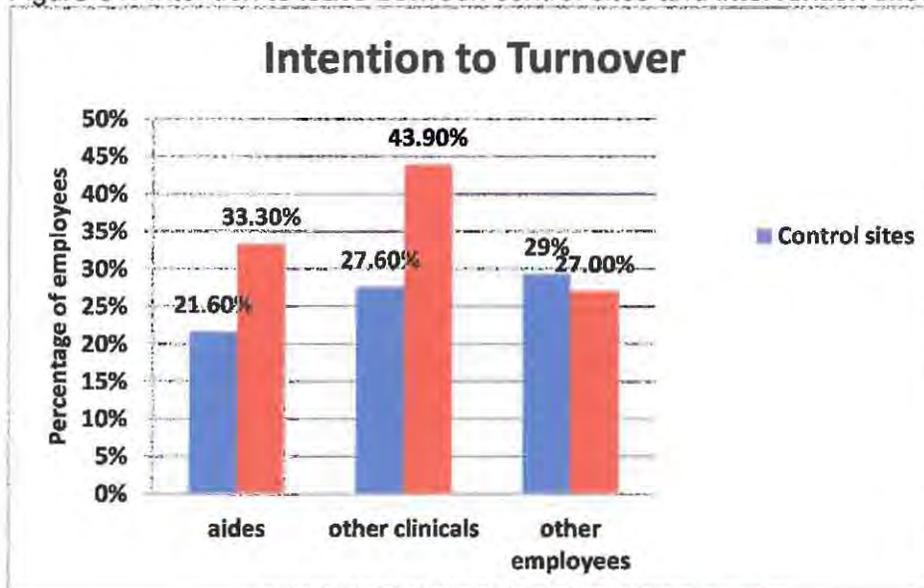
Evaluation of organizational changes and attitude changes

Attitude changes were observed in HWT participants who became more vocal and confident in planning projects and presenting them to their administrator. They also developed skills in identifying and prioritizing problems to be addressed.

No organizational changes were discussed or observed at control sites. All intervention sites had some organizational changes that they implemented and attempted. As mentioned previously, 2 centers have healthier food choices in their vending machines, including yogurt, sandwiches, salads, juices. A third center offers a choice of sandwiches and main course salads daily through their dining services. Note that this is different from just offering the food that residents receive, which is often bland and high in fats and carbohydrates.

Two centers created quiet places for workers to relax – an improved, inviting break room and an outdoor area with picnic tables and chairs. One center started a garden with the intention of providing fresh food, building teamwork, getting exercise and fresh air, which is now an ongoing tradition. Two centers addressed communication problems, attempting to reduce stress and improve care. One center has agreed to having a Train-the-Trainer program to enable their nurse educator to deliver ergonomics training to all staff. Their health and safety committee has also agreed to developing an ergonomics facilitator program, with front line workers acting as a go-to person to help resolve and report ergonomics problems.

Except for ergonomics training, getting plant donations for the garden, and a one-time nutrition and exercise demonstration, all ideas for programs at intervention sites were developed by the HWT members. The investigators/facilitators helped to guide the planning process and encouraged teams to present their ideas to management directly.

The F4 surveys were conducted in the summer and fall of 2010. Table 4 shows responses that differed between our 3 intervention centers (see above) and the 3 control centers that had pre-existing programs in 2007-8. Most differences (except for the highlighted rows) are in the direction of the intervention sites having more awareness of wellness activities or more employee engagement. There was little difference between intervention and control sites in

health behavior, except that the proportion of workers eating healthier was consistently higher at intervention sites.

Table 4.   Wellness program evaluation by employee survey: 3 control and 3 intervention centers, GHCC, 2010.

	Control (%)	Intervention (%)	p-value
77. Does center have wellness program?	40.6	53.1	<0.0001
78. Specific programs offered?			
(d) garden	4.0	11.9*	0.0003
(e) education about healthy eating	27.8	36.0	0.063
(f) - healthy recipe swap/potluck - participated	17.6	9.1	0.0246
(g) weight loss	35.5	14.2	<0.0001
- - weight loss - participated	14.3	6.7	<0.0001
(j) stress reduction	20.1	13.5	0.037
(k) quiet place to relax	17.0	27.3	0.0016
- - quiet place - participated	10.5	17.8	0.0547
(l) education on health/wellness	24.1	32.4	0.0302
80. Hours of weekly wellness participation (1+ hr vs. <1 hr/week)	7.9	16.3	0.01
82. Reasons for not participating			
(a) job duties intervened	11.4	23.0	<0.0001
(e) activities scheduled for too long a period	0.5	2.6	0.016
83. How are wellness activities planned?			
(a) staff members asked for suggestions	11.2	17.8	0.0085
(b) wellness champion plans them	1.7	4.5	0.028
(c) team or committee plans them	17.2	24.9	0.008
(e) there are no activities	16.9	12.0	0.053
84. Changes in health in past year?			
(b) improved personal health	10.2	14.9	0.0457
(c) eating healthier	18.2	25.1	0.018
(d) sick less often	7.5	10.7	0.11
(g) less pain	2.7	6.0	0.024
85. Organizational changes since wellness program began?			
(c) More opportunities for decision-making	2.7	5.8	0.035
(d) More opportunities to share opinion	5.0	10.5	0.004

* The staff garden was only done at one of these 3 centers

Aim 4 – Discussion and Conclusions

There were no differences between intervention and control sites in the frequency of observed resident handling activities or equipment use while resident handling, but the survey responses for physical ergonomic exposures indicated slightly lower demands at the intervention sites. However, post-SRHP rates of workers' compensation claims did not indicate different outcomes between intervention and control sites.

Although we hypothesized that the previous wellness activities at the control centers would cause them to have better health indicators than intervention centers, the prevalence of both chronic disease and current smoking was higher at the control sites, and intervention sites reported higher self-rated health than controls. No differences between centers were noted for musculoskeletal symptoms, BMI, or leisure-time exercise (40-45% of respondents in five of six centers reported exercising once or more per week).

It seemed that, at least in the F4 survey data, workers in the intervention sites rated the working conditions as slightly worse and expressed higher intention to turnover than in control sites. This contradicted our expectations.

HWTs seem to be a viable means of building an integrated health protection/ health promotion program. Workers were interested and dedicated to improving their health and their work environments. When they received support from upper and middle management, they were able to initiate successful programs and build enthusiasm. When their ideas were dismissed or they were not recognized for their efforts, they became demoralized and needed encouragement to continue. A better means of interaction between management and the team and between middle management and the team is needed to assure the sustainability of these programs. Two of the three centers seem to be sustainable, while members of the third team all agreed that if the investigators were no longer involved, they would not continue.

The program is hampered by fact that is an "extra" program – not required by law or by the corporation. It is also hampered by lack of funding. The corporation originally allocated $700 a year for wellness, a minimal sum, but at least a recognition of need. It was withdrawn two years ago, so now funding depends on the support of the center administrator and the administrator's perceived priority for it. Administrators are faced with completing claims on their time and funding by corporate-mandated programs that often occur simultaneously, making it difficult to "squeeze in" wellness. Administrators must also be willing to cede greater responsibility to their employees and to assist in getting management involved.

Time for employees to participate was a major challenge. Office personnel, who have greater flexibility and access to computers for communication, often became the primary team organizers. However, but without input from CNAs, housekeepers, and kitchen staff, they were not informed enough to be able to address the needs of those workers.

Consistent and sufficient staffing would increase the ability of HWTs to be effective and to function more independently.

Aim 5. To utilize an economic evaluation model for assessing costs, benefits, and cost-effectiveness of interventions, and to summarize results in the form of a program evaluation model that is understandable to all study partners.

The objective of this study was to determine whether there was a viable business case for a safe resident handling program (SRHP) in a large chain of nursing homes. Our hypothesis was that the program would reduce the costs of workers compensation claims and other costs, both at the level of facility-by-facility as well as at the aggregate level for the corporation as a whole.

We adapted the "net-cost model" [39, 40] for evaluating interventions implemented at the level of an individual organization. From the company's perspective, it has three essential components: 1) the cost of equipment and labor to implement the program; 2) the degree of effectiveness of the interventions; and 3) any increase in productivity that might result. This is essentially an accounting framework where net cost, is equal to investment on intervention equipment plus labor costs involved in implementing the intervention minus avoidable health care costs of illness, injury and productivity losses. The full set of relevant costs, from the corporation's

perspective, include: workers compensation claims (medical care and indemnity); productivity losses from (uncompensated) absenteeism and presenteeism; malpractice losses due to litigation; disability payments; and turnover costs.

The net-cost estimates of the intervention for the SRHP were estimated from the company's perspective. Using the accounting framework of the net-cost model, we computed all of the relevant metrics for the calculation of the benefits to costs ratio (BCR), payback period, and rate of return on investment (ROI) which is the inverse of the payback period.

The company is a privately-held, self-insured corporation that owns or jointly manages a chain of skilled nursing facilities in the eastern United States as of 12/31/2009. The safe resident handling program components included protocols for assessing each resident's need for lift devices; purchasing lift equipment; training employees in its use and confirming their competency; and adopting maintenance and use policies and practices (including sling laundering and battery re-charging).

Complete administrative data were provided for 120 skilled nursing facilities (corporate business units) where the program was implemented during the period from March, 2004, to November, 2007. Those centers (n=110) which had accrued at least 3 years of data post-intervention as of December, 2009, were included for analysis.

Workers' compensation claims (WC) data were disaggregated over individual claims. Workers' compensation claims (2004-2009) and clinical employee retention data (2003-2009) were identified by date as pre- or post- intervention on the basis of each center's implementation date. Data on other possible costs of worker injury to the corporation were not available.

Net cost was estimated according to the following equations:
- Annualized net-costs = Total intervention costs - Avoided medical care costs - Avoided productivity losses - Avoided employee turnover costs
- Avoided medical costs = Pre-intervention WC medical costs - Post-intervention WC medical costs
- Avoided indemnity costs = Pre-intervention WC indemnity costs - Post-intervention WC indemnity costs
- Avoided turnover costs = Pre-intervention turnover costs - Post-intervention turnover costs

The total annualized intervention cost metrics included: equipment purchases net of tax savings; training costs inclusive of contract costs; and operating and maintenance costs. The effectiveness metrics included: avoided costs in terms of Worker's Compensation (WC) medical care, WC indemnity (i.e., proxy for productivity losses) and turnover (i.e., costs related to human capital). Avoided costs were computed by comparing costs in each category before versus after the intervention in each center.

All costs were annualized and calculated at the level of the individual facility. To adjust for inflationary changes, all costs were converted to the base year dollar values of 2006. All direct costs of investment (capital equipment and labor) were defined as the direct additional cost that was incurred due to the implementation of the intervention ("marginal cost"). The lump-sum investment costs on the over-head lifts were annualized by determining the capital recovery factor for the relevant equipment. The capital recovery factor is the sum of the depreciation rate and the opportunity cost of capital (a uniform rate of 7% was assumed to be the average long run rate of return on private capital). The depreciation rate was determined by taking into account the service life, salvage value, and market rate of interest rate and adjusted for by the depreciation allowance provided by the US tax system.

Both nurse turnover rates and the costs of nurse turnover are high for health care organizations [41-44]. The nursing turnover cost calculation methodology is based upon the economic theory of human capital that recognizes nurses as organizational assets with knowledge, skills and abilities that impact organizational productivity and performance. These turnover costs are substantial and impact the rate of return on investment. Turnover-related productivity losses are significantly large but are often neglected because they are difficult to measure.

We employed two different estimates of workforce turnover costs. First, we utilized the set of estimates on turnover costs that were provided to us by the company's Human Resources office. These estimates were averages for the period (2003-2009), by state and job category (nurse and nursing aide). In all categories, the company's estimated turnover cost did not exceed 34% of salary for that job category (detailed breakdown of these costs is available from the authors on request). Since the overall ROI depends upon variances in the model parameters, we computed the 95% confidence interval for net savings per bed, using the standard error of the sampling distribution of the sample mean and a reliability coefficient.

The total annualized investment costs for the SRHP over all 110 business units were $2.740 million. Total annualized avoided costs, based on medical care, indemnity and turnover (company cost estimates) alone, were estimated at $4.629 million (Table 5). Thus, in the three years following SRHP implementation, the company realized a total net savings of at least $1.89 million (Annualized Investment Costs – Annualized Avoided Costs), for a benefit to cost ratio (BCR) of 1.689. The average annualized net savings per bed for the 110 centers was $143, with a 95% confidence interval of $22 to $264.

The company's own figures for turnover cost were considerably lower than those in the available literature, so the net savings based on their data were also considerably lower ($1.89 million) than the literature-based turnover cost estimates ($5.73 million). These alternative figures gave an average annualized net savings per bed of $417 and a benefit to cost ratio (BCR) of 3.07. The 95% confidence interval for this estimate of net savings per bed was $100 to $735.

On the whole, the magnitude of net-savings outweighed the magnitude of net-costs. However, there was substantial variability in net-costs per bed among the 110 facilities (Figure 32). There were 61 centers with annualized cost savings and 49 with positive net costs. The range was very large, from positive net savings of approximately $3,064 per bed to a negative savings (i.e., net cost) of over $992 per bed (based on company based turnover estimates). On average, centers with longer observation time post-intervention had higher total avoided costs of workers compensation (Table 6). No similar pattern was evident for turnover costs.

Table 5. Total reduction in workers' compensation and turnover costs (company data) following implementation of Safe Resident Handling Program in 110 skilled nursing facilities, eastern United States.

Avoided Turnover Costs	$817,581 (18%)
Avoided Medical Costs	$2,321,133 (50%)
Avoided Indemnity Costs	$1,490,517 (32%)
Total Avoided Costs	$4,629,232(100%)

Table 6. Net savings following implementation of Safe Resident Handling Program in 110 skilled nursing facilities, eastern United States, by length of post-intervention period.

Time Post Intervention	Net Savings Per Facility Per Bed	
	< 5 years (n = 38)	≥ 5 years (n = 72)
Avoided Turnover Costs (company data)	$37	$67
Avoided Workers' Compensation (Medical)	$124	$257
Avoided Workers' Compensation (Indemnity)	$81	$148
Average Net Savings	$83	$258

Figure 32: Annualized net savings per bed following implementation of Safe Resident Handling Program in a chain of skilled nursing facilities, eastern United States.

Skilled Nursing Facilities
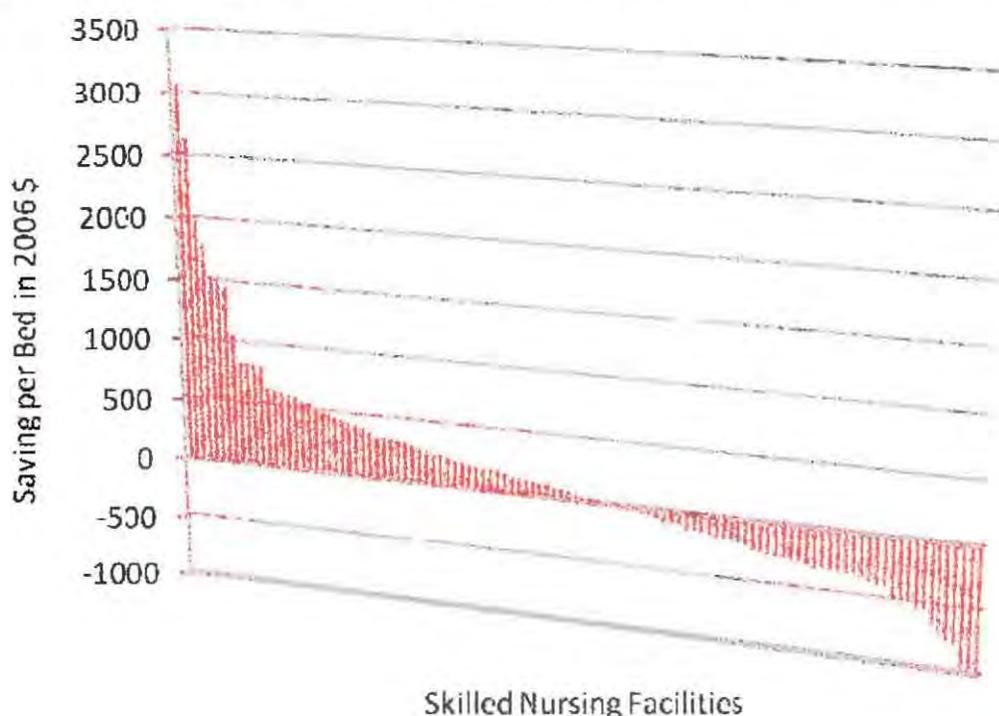
Net costs of combined SRHP and Workplace Health Promotion (WHP) Programs

We also assessed the impact of worksite health promotion (WHP) programs, to determine whether the effectiveness of the SRHP intervention is enhanced in centers with wellness program activities ("SRHP+WHP"). We estimated net-costs from the employer's perspective. Facilities with SRHP were classified as with wellness program (n=39) or without wellness program (n=39); those for which enough information was not available (n=32) were ignored in these analyses.

Net savings following the SRHP were compared between centers that did and did not also have wellness activities. Although there was substantial variability in results by site, the initial results showed that the extent of net savings resulting from the intervention of the SRHP was more favorable when the SRHP was combined with either type of wellness program. The average

annualized **net savings per bed** for all facilities with SRHP and WHP, based on the company's turnover costs, was $178 versus $25 with SRHP alone. The corresponding estimates based on turnover costs from the economics literature were $843 and $299.

The program evaluation model was not developed because of personnel effort reductions pursuant to the budget cuts at the time of the initial award.

Discussion and Conclusions

This study of a safe resident handling program in a large chain of nursing homes makes a strong business case for the program for the corporation as a whole. The overall Benefit to Cost Ratio was 1.7 to 3.07 and the payback period was 1.98 to 1.06 year (based on alternative turnover cost estimates). Since GHCC is self-insured for workers compensation insurance, the reduction in injury costs directly benefits the corporation.

However, there was considerable inter-facility variability in net costs. For a fairly large number of facilities, the costs of investment outweighed the benefits. The benefits increased with length of observation time after the program began, suggesting either institutional learning or a lag in reduction of injury occurrence and severity, or both. These results suggest a need for further investigation of factors that might encourage or hinder the successes of such a program.

Turnover accounted for a large proportion of net costs (and savings) for the employer, even when using the lower estimate of cost provided by the company. There is considerable uncertainty in the literature around the estimates of the ratio of turnover cost to salary in health care settings, although recent literature emphasizes the "shocking cost of turnover in the health care sector" [44]. Nonetheless, turnover studies across different economic sectors and organizations show that a decrease in turnover rate can be expected to enhance organizational productivity, in line with human capital theory [45]. This warrants future studies to estimate empirically the turnover costs of nursing home employees with greater precision.

A related issue is that the SRHP and WHP in combination with each other seemed to be a more effective intervention strategy than SRHP alone. This result is difficult to interpret, because other preliminary analyses suggest little measurable health benefits of WHP to the total workforce in those centers. Several authors have recently called attention to the need for coordinating and integrating worksite health promotion and occupational health and safety interventions for enhancing worker health [Cherniack, 2011 #1389; Punnett, 2009 #518; Sorensen, 2004 #196]. This research is still in its infancy and a broad range of research questions need to be addressed.

This study has both strengths and weaknesses. Major strengths include the size of the study population and the length of follow-up, as well as the availability of data in a standardized format on a corporate basis for a large number of facilities and hence our ability to examine variability among centers.

The major limitation is that data were available only for workers compensation and turnover costs. WC costs – both medical and indemnity – are likely underestimates of the true complete losses for employers, as enumerated by ourselves and others [39, 46]. Therefore, it is important to keep in mind that our results might underestimate the benefits of the program. For example, workplace injury under-reporting, which is notorious in general in the U.S. [47] and specifically in the healthcare sector [48] would lead to further underestimation of true injury costs.

In addition, uncompensated costs of absenteeism were not available. Productivity in the service sector is difficult to measure but might be affected by injuries or diseases that impair full functioning, even when employees are still present on the job. Further, malpractice losses by nursing homes due to litigation are substantial on a national scale [49], but such data were not

available for this study. A separate issue is that costs to employees, ranging from out-of-pocket medical expenses to social and familial consequences [50]. have not been counted here at all because this study focused on ROI for the employer alone.

The second and third components of the net-cost model are the elements that reduce the real cost of the intervention. Obviously, intervention effectiveness is key. Greater reduction in exposure and in risk more avoided injuries, illnesses, and other productivity losses, and therefore, lower net costs of the intervention. The ability to attribute changes in those components to the intervention itself is critical to correct interpretation of study findings. In this instance, it is plausible to attribute at least a large proportion of the reduced injury occurrence and cost to the SRHP. In support of this argument is the fact that our favorable economic outcomes were in line with observed reductions in ergonomic exposures, especially for nursing assistants, in these workplaces [51]. Less self-evident is whether all of the reduced turnover can be attributed similarly. Another possible explanation is that other center characteristics, or recent programming within the company concurrent with the SRHP, might be more directly responsible. We will seek to address this question in later analyses.

On the whole, our results show a favorable economic outcome with respect to avoided costs of workers compensation and turnover and make a strong business case from the entire corporation's perspective. However, at a disaggregated level, although in the majority of nursing facilities the result of the intervention was economically sound, there were others where the costs were higher than the benefits. These unfavorable economic results are in line with the negative intervention profitability results of the four studies cited above [52-55].

To date, little effort has been made to identify and measure the impact of the different organizational and/or worker characteristics that might contribute to the success or failure of workplace interventions. The variables that help enhance the effectiveness of the implementation of a given intervention should be identified so that they can be addressed first, in a "pre-intervention" phase, to increase organizational readiness for change, or so that interventions can be tailored to the specific characteristics of the settings. Knowledge of the relevant organizational and employee determinants will also help to determine the role of confounding variables that might have contaminated the results of intervention studies, both this one and others. In the light of a surge of interest in the "business case model" for occupational safety and health interventions, the ability to incorporate organizational predictors of success or failure into intervention studies would greatly enhance the practical value of that research.

Given the rate of return on investment (ROI) criterion for many employers, the actual adoption of these interventions in workplaces may be limited. As a result, society may not realize the extent of health outcome benefits that could be realized with broader implementation of workforce interventions. However, while economic ROI would seem to be an obvious motivator for employer adoption of occupational safety and health interventions, it is not clear what influence this actually holds relative to other factors [56]. Nevertheless, it has obviously implications at the "micro" level for employer decisions and at the "macro" level for driving down health care costs and improving the overall quality of preventive care. In this regard, our study provides a straight forward convenient tool for the employer to determine the costs and benefits of alternative interventions.

Also, to facilitate the decision-making process in occupational health and safety, it would be useful in future studies to estimate the net cost of intervention from other stakeholders' perspectives: employee; insurer; government; and society as a whole. Economic valuation models from the perspective of the different stakeholders can help to align the incentives, provide guidance for policy formulation and reduce the barriers to successful workplace interventions [57].

Aim 6. To utilize a social-ecological model to evaluate quantitatively and qualitatively these workplace programs as potential mechanisms for integrating health protection with health promotion, and produce recommendations for future efforts.

In recognition of the multi-level nature of how the work environment affects worker health, a series of short reports has been generated and transmitted to GHCC over the course of the project (Appendix A-4). These were intended to provide feedback to workers, center administrators, and regional staff responsible for employee health, with multiple goals. On one hand it was hoped that the reports would sustain worker interest and participation in surveys, focus groups, and participatory team activities. At the same time we sought to help motivate new and continued commitment to the SRHP and the WHP by all parties within the company.

While many health promotion programs focus on individual "readiness to change", this program looked at the broader context. A social-ecological perspective "focuses on the interactions between humans and their environments and places greater emphasis on the social, institutional and cultural contexts of people-environment relations..." [58, 59]. The social ecological approach to health promotion takes both individual and social environmental factor into account and focuses on interventions that change interpersonal, organizational and public policy [60].

Typical levels of evaluation for a social ecological model are: intrapersonal (individual), interpersonal (peer support), institutional, community, and policy. For this analysis, we have modified the levels to include the health and wellness teams at intervention centers, since they form a means of communicating with employees and between employees and management. Institutional support is interpreted as nursing center management and administration. Community is interpreted to mean corporate leadership. The levels of organization to be considered here, therefore, are: individual, interpersonal, Health and Wellness Team, institutional, Community (corporate), and policy. See Figure 33.

Individual

Nursing home employees are primarily women (89%), many with low incomes, and many from different cultures (51% minority). A number of individual workers have expressed a desire to improve their health through exercise, diet, smoking cessation, and stress reduction. They expressed an interest in learning more about nutrition and health. At the beginning of this study, healthy food options were not available at centers. Employees either brought their lunch from home, ordered from fast food restaurants or ate snacks from the vending machine. While a proportion of employees indicated that they exercised regularly, the majority did not. In focus groups, family demands, school and second jobs were stated as reasons for not being able to take care of their own health.

Stresses at home and work also impacted their health. When asked about health concerns in focus groups, CNAs at the three intervention and three control sites indicated that stress was their greatest concern, caused by short-staffing, lack of respect, lack of teamwork, lack of supervisor and peer support, lack of paid time for participation in health and wellness activities, inability to leave their job for any length of time, and an inability to pay personal attention to residents. It should be noted that inability to take breaks, including lunch breaks resulted in a corporate policy requiring all employees to sign out and in at lunch time. Even with this policy, many employees still worked through their lunch breaks.

Many workers stated that the no-lift program instituted at every center resulted in fewer injuries and made their jobs easier. There were still instances where lift equipment could not be used and where injuries resulted. All indicated a belief that aches and pains were "just part of the job."

Figure 33 Health and Wellness Program Implementation Level

Individual level – health and wellness activities that improve personal level health, e.g. yoga

Interpersonal level – health and wellness activities bounding people in teams and improve group level health, e.g. biggest loser, walking program

Department level – health and wellness activities that change the department level conditions and improve department level health, e.g. ergonomics training for nursing staff

Facility level – health and wellness activities that change the conditions of the center work environment and improve center level health, e.g. healthy choices from kitchen, outdoor picnic tables

Corporate level – The corporate makes some policy changes which will improve employee health of all centers, e.g. 15-minute extra break for health and wellness activities; center budget for health and wellness programs

Interpersonal

In cases where workers, particularly CNAs, have worked together for a while and developed a support system, they seem to feel better able to handle their work with less stress. In focus groups, an issue of contention was that some workers took too much time off – to take care of sick children or other family emergencies or to take a mental health break. Other workers, mostly younger with small children, stated that without an occasional mental health day, they could not continue in their position. Office employees were much better able to support each other due to greater flexibility in their jobs. While they experienced the stress of meeting deadlines, they had more control over the pacing of the work. These were the employees who were most able to attend health and wellness meetings, and were able to carry out planning and recruiting for activities.

Health and Wellness Teams

As a team of workers who identify occupational/ health issues of concern, the HWTs were intended to act as an interface between workers and management to plan projects, negotiate with management on implementing needed change or particular projects, recruit workers to participate, and evaluate successes and problems. This was done by talking to other workers and/or by distributing questionnaires. At all three intervention sites, HWTs independently identified the need for healthier food options on site as their first project. At two centers, questionnaires were designed and distributed to assess the kinds of food people desired. A third site felt confident they knew what was needed, but asked workers in different departments. In all cases the teams talked to the vending company representative to ask for salads, healthy sandwiches, fruit, yogurt and soup for refrigerated machines. One center ordered the machine through the vendor. Since this was a longer term project, the team at this center proposed having baskets of fruit available to employees on each floor. This same HWT decided to start an employee garden to provide healthy food, opportunities for exercise, relaxation and teamwork. The garden has persisted over four seasons, growing larger each year and serving more of the employee population. It is often pointed to with pride. This center eventually obtained approval from the administrator to have the kitchen staff at the center provide healthy food options, which include a choice of salads and sandwiches daily at $2 each. These projects were proposed to the administrator at the respective centers for approval.

At the beginning of the research study all HWTs had representation from CNAs, who form the largest employee segment. With time and with corporate and federal cuts, staffing has decreased, making it difficult for CNAs to participate on the team. This lack of input has negatively impacted the ability of the team to represent the needs and ideas of these workers. At two of the centers there is no CNA participation at present. At the third there are CNAs from second shift, but not from the first shift, which is the most heavily populated and the busiest. Historically, the teams have been most relevant when they have had CNA input.

HWT interaction with management has faced a number of obstacles but has also had successes. The best outcomes occurred when the team identified an issue and a project and prepared a written proposal form that detailed the project title, its purpose, the time frame for development and implementation, a list of tasks with assigned (volunteer) task leaders, the benefits to staff, center, and residents, and the costs. This was used to present the case to the administrator, who then attended a team meeting to discuss the proposal.

It was important that the team had developed the project idea on their own before they brought it to the administrator. This put them on more equal footing and prepared them to answer questions and defend the project. This process has played a major role in strengthening the team and its sense of purpose. They were more often able to get immediate feedback from the decision-maker and to put the plan into action quickly. At other times there were long waits for a decision or a management promise of promoting implementation or providing funding for a project without follow-through.

The teams had no dedicated budget and were often told there was no money for a project that would have cost very little. For example, one team tried to solve a communication problem concerning room changes and new additions, which led to stress over last-minute or indirect notification and caused employees at different levels to rush to change records, change food orders, and thoroughly clean rooms. A white board that listed such changes would be posted in each unit. The team thought about who might possibly help implement this change. The cost was less than $40. The administrator told them the cost was not a problem, but that management was already working on a larger communication project that would resolve their problems within six months. There was no recognition of the value of this quick fix as an interim

measure, leaving the team frustrated. The HWT has no official way of interacting with middle management, which often means that departments that might help promote or assist with a project are not involved, because the administrator did not mobilize them.

Institution

Nursing homes are flat organizations where the administrator makes all major decisions without much delegation. Managers meet several times a week, often daily, to review new admissions, incidents involving residents, any changes in staff or resident care/ location. Front-line workers primarily interact with their supervisors. While the corporation has implemented management training programs to develop a coaching approach to management, there may be very different approaches to management that affect the working environment for their employees. Within the same building we have seen descriptions of extremely hierarchical management, where workers are punished for suggesting improvements or changes, while in another wing a manager encourages problem-solving and teamwork.

Although administrators stated that they value and encourage worker involvement and decision-making, they might not have known how to allow this to happen. There was no budget set aside for wellness activities. Previously the corporate organization allocated $700 per year. Many administrators seemed to supplement this from their discretionary funds. Because there was no standard budget, every project had to be justified to the administrator. In one center, team members were told there was no money for a project. The team, on its own, sponsored a fund-raising event and raised $500 to purchase picnic tables and chairs for a relaxation area outdoors, where staff could relax on their breaks. At another center, the administrator paid for picnic tables and for improving and remodeling a break room for employees, when the team requested it, and turned over responsibility for deciding color scheme and layout to team members.

Scheduling impacted the ability of teams to meet and of employees to participate in activities. Some centers seemed to be more flexible in arranging schedules so employees could participate. In one control center a nurse manager covered an entire unit herself while her staff participated in a wellness activity. This is not sustainable over the long term, but it demonstrated that centers may have more freedom than they think in arranging scheduling.

Managers, in general, did not seem fully aware of the health protection/health prevention activities sponsored by the Health and Wellness Team.

Corporate

The corporation sponsors many programs such as coaching management and a "START" program to improve civility and teamwork at centers. However, departments apparently do not communicate with each other, because a number of different programs may start at the same time, requiring resources, and stretching the capacity of center administrators. A corporate-wide wellness initiative, Living Well, started in 2011 at all centers with little introduction. The emphasis is on individual improvement in eating well, exercising, taking care of finances, and relieving stress. With little guidance from the corporation, each center is left to its own devices to distribute materials and begin programs. A six-week walking program failed at all but one of the six centers in our study, because of faulty pedometers. Although the corporation stresses wellness, they now give no funding to support programs.

Corporate concerns necessarily focus on the bottom line but sometimes to the detriment of care, raising stress levels among all levels at individual centers. Administrators used to have the flexibility to keep clinical staff overtime, to cover for an absent employee or a sudden need. The company has a new policy that requires administrators to document the need for overtime. Overtime hours are held against them in performance reviews. With recent cuts in Medicare

reimbursement, the company is cutting back on activities that add cost. Travel costs for regional management meetings have been cut. Administrators are urged to lay off staff if they have empty beds. These conditions make programs such as Health and Wellness seem an extra burden.

Policy

Federal and state policy determines the CNA to patient ratio in nursing homes – currently 1:10 in Mass. With absenteeism this ratio can be as high as 1:16, according to CNAs. Focus groups with CNAs and interviews with management agreed that an ideal ratio would be 1:6. Since much of the stress as these centers stems from the high caseload, a change in policy could encourage better care for residents, as well as healthier work places for employees.

Policy on Medicare reimbursement plays a critical role in the care centers can provide, since the majority of long term care patients are on Medicare.

Integrating Health Protection and Health Promotion

Workers have no trouble in grasping the links between stress and health. Many of the causes of stress stem from the organization of work. Often improving communication, creating a permanent change in the workplace to provide a place to relax can remove or lessen a source of stress. Providing healthy food options through vending machines or served at reduced prices through the Center's dining services affect the social ecology of the whole center. Ergonomics training conducted for all employees at the intervention sites resulted in interest from in-house trainers to be able to provide that training on an ongoing basis. These are changes that were not seen at control sites.

Managers often needed to be convinced of the efficacy of a Health Protection/Health Promotion program, but they tended to support it when they saw the benefit.

Corporate and regional responsibility for OHS rests with different personnel than that for WHP. Discussions with each group have shown clearly that the division between these two domains is clearly entrenched within the organizational structure and that there are no incentives or rewards for crossing over that line. It may be possible to introduce work environment concerns into the WHP arena, by continuing to present study results such as those shown about the influence of work organization on health and health behaviors. However, it seems unlikely that OHS staff will come to find it appropriate to take on WHP concerns.

Recommendations

The major obstacle to developing these programs is the inability of workers to get time off their jobs to participate in the HWT or for participants to get off to participate in planned activities. The participation of CNAs is critical to having a truly representative team. At one center we are planning to hold meeting on the floor in different units to get input from the clinical staff. If this is effective, we will expand this to other centers.

Lack of funding is also a key concern. Ideally the regional or corporate office would provide a budget to each center to carry out activities. A corporate policy to give workers paid 15-minute "Health and Wellness" break, in addition to their regular breaks, would stimulate participation and could pay off in increased worker satisfaction, reduced turnover, and improved health.

<u>Project management and evaluation</u>

A. Research conduct: Completion, timeliness and quality of project activities
1. Compliance with IRB requirements was achieved in a timely manner for all activities in aims 1-5 and for each of the project years. Record keeping for human subjects training certification, and IRB continuing annual review was centrally maintained by the Center Administrator for all students, faculty and staff on the project. Additional confidentiality protections were established and followed for residents of the nursing care center study sites based as requested by Genesis. Examples of confidentiality protocols included behavioral expectations for all personnel involved in site-based data collection.
2. Data collection activities were carried out as planned for all Aims, including the following:
   - Collection of corporate administrative data (workforce rosters, absenteeism, turnover, compensation claims, etc.) was executed largely as planned. Collecting the range of data needed proved to be a substantial effort both for the university research personnel, as well as the corporation. The effort was due to the breadth of data collected, the multiple year duration, and most importantly, the lack of central coordination within the corporation for data collection and analysis related to employee health. Importantly, the corporation made every effort to fulfill all requests throughout the study period, even after the primary corporate study liaison left the company to take another position.
   - There were a few data types that were sought by investigators but which Genesis was unable to provide, for various reasons. These included data on "patient" (resident) acuity by center; centralized information on Wellness program implementation at each center; and identified individual employee work histories (e.g., service date).
   - Assessment of site support for employee health and participation was implemented as planned but with some delay. A commercial online survey service (www.zoomerang.com) was used to obtain data on Genesis center administrators' attitudes concerning organizational support for employee health. These data were intended to inform the site selection process for the participatory health promotion intervention. However, the survey announcement and launch timeline was much longer than expected because the corporation relied on a regional management structure for communication and implementation. As a result, we did proceed with the survey but did not use the data as part of the site selection process. Response rate (proportion of those invited who completed) was 60% (very strong, given the time demands of these executives). However, we were not able to obtain surveys from key facilities participating in the ergonomic job analysis and health promotion components of the study, which negatively impacted the analyses within Aims 3, 4, and 6.
   - Direct observations of clinical staff using PATH methodology, as well as employee questionnaires, were implemented on schedule and with excellent quality. All PATH observers received approximately 30 hours of training and were required to obtain an inter-rater reliability score of .8 to be approved for field data collection. All questionnaire administrators received at least 2 hours of training prior to field work. Data collection site visits combined both job analysis and questionnaire administration for maximum efficiency and coordination. Rigorous field data collection and site preparation protocols, consistent and timely communication with corporate and study site liaisons, and (very importantly) appropriate participant incentive levels all contributed to excellent

participation at baseline and at each of the 4 follow-up survey occasions (overall average 74%, range 60 to 90%).

- Health promotion program evaluation was implemented differently from the methods described in the grant application. Although semiannual questionnaires were planned for evaluating overall workforce participation, in practice we analyzed existing Genesis internal wellness participation data (during years 2, 3, and 4). We directly measured workforce wellness program participation, using the Pro-Care F4 survey, only in year 4 after the participatory sites had completed 2 years of activities. Planned systematic evaluation of activities using short questionnaires in both the participatory sites as well as the control sites was not carried out, as it was not feasible given the project resources.
- Likewise, measurements of height, weight, and blood pressure for wellness program participants were not collected. This would have substantially increased the personnel time required and was dropped from the work plan pursuant to budget cuts at the time of the original award.
- Key informant interviews and focus groups were conducted as planned in control and experimental groups, although these were completed slightly later than planned in the time line. Goals set for participation in interviews (administrators, directors of nurses, and wellness champions) and focus groups (front line clinical personnel) were largely achieved both at baseline and at follow up.

3. Intervention Implementation: Participatory team-building (Aim 3) was implemented as planned, although somewhat later in the time line than was planned due to the delay in the interviews and focus groups as mentioned above. However, development of the groups proceeded according to plan, allowing for at least 2 years of intervention and follow-up data collection activities to evaluate the program within the grant period. Overall the participatory teams met twice a month, averaging 4-6 members at the meetings. Attendance fluctuated from meeting to meeting, as described in greater detail in the Results section.

4. Process evaluation: Multiple methods were used to assess integrity of the research intervention and data collection protocols, as well as satisfaction of the corporation throughout the five years of the project.
- Participatory teams--analysis of meeting minutes, attendance sheets, and corresponding facilitator logs, and mid-course satisfaction surveys of participatory teams and facility administrators.
- Corporation—mid-course interview plus bi-monthly conference calls with regional safety and risk managers
- Project management—bi-weekly meetings of the university study team members provided a forum to discuss site observations and developments at the corporate level that were relevant to the study outcomes. Written meeting minutes captured these types of qualitative observations so they could later be use to help explain the results.

5. Conference presentations: In addition to the publications listed below, a large number of research results were presented at scientific meetings for public comment. The list of these presentations is included as Appendix A-7.

6. Outreach products: A variety of short progress reports and newsletter articles for participating sites were prepared and circulated. The list of these presentations is included as Appendix A-4.

B. Project Management
1. Project management: Bi-weekly meetings of the multidisciplinary university study team members were facilitated by the PI and Project Manager to review results of data collection site visits, monitor progress across all study aims, identify ways to improve recruitment, and ensure consistency of protocols among sites and among baseline and follow up visits.
2. Adequacy of project personnel: Both a full-time project manager for the entire five-year study period and a full-time post-doctoral research fellow would have been beneficial, given the duration and scope of the project. Although all the goals and aims were met, more project management staff effort was needed in the first 2-3 years of the grant to oversee a more thorough evaluation strategy for the corporate wellness program. With so many labor-intensive data collection and management activities happening simultaneously (field PATH observations, questionnaires, administrative data) there was limited personnel time available simultaneously to attend to evaluation, such as assessing effectiveness of the corporate wellness program. Additional doctoral students or post-doctoral fellows would have provided more capacity for real-time data analysis of survey and PATH data and coversheets. Because of the long study duration, we needed doctoral students to spend large amounts of time during the non-academic year doing data collection, and this took time away from working with the data we had already collected.
3. Student learning opportunities: This project employed 10 masters students and 5 doctoral students as Research Assistants, all of whom used ProCare study data as the basis for their capstone projects or doctoral dissertations. An additional 5 masters and 6 doctoral students worked on an hourly basis in a wide variety of tasks, from data collection (questionnaire distribution and PATH observations) to data analysis to providing ergonomics training. Most but not all of these students were hired from within the Department of Work Environment; other UML departments represented were Nursing, Economics, Psychology, Community Health and Sustainability, Education, and Regional Economic and Social Development. Thus the interdisciplinary goals of the project were facilitated by dialogue among the project participants who contributed various modes of inquiry to the research effort.
4. Study methods: Despite (anticipated) turnover rates in this sector, we were able to utilize the serial panel design to obtain repeat measurements on a number of individual survey participants and to examine changes over time in a wide variety of factors. Employing mixed methods in the research design was extremely useful for complementary analyses and triangulating the results.

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Appendices

A-1   Sample (F2 Survey) Instrument and Table of Contents of the entire series of Questions
A-2   My Innerview Survey
A-3   ProCare survey of Center Administrators: Organizational Climate
A-4   ProCare Reports to Genesis HC Corporation
A-5   CPHNEW Interim Evaluation Report
A-6   CPHNEW Full Evaluation Report
A-7   ProCare Presentation List

Publications

Holmberg MD, Flum M, Punnett L, West W, Zhang Y, Qamili S. Nursing assistants' dilemma: Caregiver vs. caretaker. (under review: Hospital Topics).

> *Addresses Aims 2 and 3, by identifying the perceived effect of the work environment on direct care workers' mental and physical health, including their perception of quality care for residents; these concerns should be accounted for in creating and evaluating the effect of workplace health promotion programs.*

Kurowski A: [2011] Ergonomic exposure assessment of nursing assistants in nursing homes following a safe resident handling intervention, Sc.D. Thesis, University of Massachusetts Lowell.

> *Addresses Aim 1 by examining the effect of the Safe Resident Handling Program on physical exposures of clinical staff including body postures and manual handling over time. An index was also computed to examine the effect of the SRHP on physical workload of clinical staff over time. Over a two-year period, changes in equipment use while resident handling and changes in physical workload for nursing assistants was stratified by center, and information regarding sources of variation in these outcomes was gathered from administrative databases, self-reported survey responses, employee satisfaction surveys, and through exit interviews following ergonomic observations.*

Kurowski A, Boyer J, Fulmer S, Gore R, Punnett L. Changes in ergonomic exposures of nursing assistants after the introduction of a no-lift program in nursing homes. (under review: International Journal of Industrial Ergonomics).

> *Addresses Aim 1 by examining the effect of the Safe Resident Handling Program on observed physical ergonomic exposures of nursing assistants over time. The frequency of observed handling equipment along with trunk, arm, and leg postures, and manual and resident handling activities were examined at a baseline pre-intervention time period and found to be improved when observed 3 months, 12 months, 24 months and 36 months later.*

Kurowski A, Buchholz B, Punnett L. A physical workload index to evaluate a safe resident handling program for clinical staff in nursing homes. (under review: Human Factors).

> *Addresses Aim 1 by evaluating the Safe Resident Handling Program based on changes in physical workload for clinical personnel. Frequencies of observed combinations of postures and manual handling activities were weighted by their resulting compressive forces on the lumbar spine and then summed to produce an overall physical workload index. The index showed a decrease in total biomechanical loading over time.*

Lahiri S, Latif S, Punnett L, ProCare Team. Is there a business case for a safe resident handling program in nursing homes? (under review: American Journal of Industrial Medicine)

> *Addresses Aim 5: Utilized an economic evaluation model to assess costs, benefits, and cost-effectiveness of the Safe Resident Handling Program to reduce occupational injuries of health care workers in nursing homes. The benefit to cost ratio was in the range from 1.7 to 3.1 (depending on assumptions) with a payback period of 1-2 years.*

Miranda H, Punnett L, Gore RJ, Boyer J: [2011] Violence at the workplace increases the risk of musculoskeletal pain among nursing home workers. Occupational and Environmental Medicine 68(1) 52-57.

> *Addresses Aim 1, by identifying a previously unreported risk factor for musculoskeletal pain that should be accounted for in analysis of the effect of ergonomics programs.*

Punnett L, Cherniack M, et al: [2009] A conceptual framework for the integration of workplace health promotion and occupational ergonomics programs. Public Health Reports; 124 (Suppl 1): 16-25.

Addresses Aim 2: Describes the scientific and public health rationale for the CPH-NEW approach and the NIOSH WorkLife Initiative (WLI), and utilizes data from ProCare to illustrate some of these issues.

Punnett L, Miranda H, Gore R, Boyer J, Nobrega S. Health behaviors in the nursing home workforce. (under review: Behavioral Medicine).

Addresses Aims 2 and 3, by identifying the potential impact of work organization stressors on health behaviors, which should be accounted for in creating and evaluating the effect of workplace health promotion programs.

Russell JM, Flum M, West C, Qamili S, Zhang Y, Blais L, Punnett L, CPHNEW Research Team. Nursing assistant perspectives: Challenges and opportunities for participatory health and wellness programs in long-term care facilities. (under review: American Journal of Health Promotion)

Addresses Aims 3 and 4, by identifying the perceived effect of work organization on direct care workers' mental and physical health, showing the importance of using a participatory model in workplace health promotion programs in order to address these issues.

Zhang Y, Flum M, Nobrega S, Blais L, Qamili S, Punnett L. Work organization and health issues in long term care centers: Comparison of perceptions between caregivers and management. Journal of Gerontological Nursing 2011; 37(5) 32-40.

Addresses Aim 3 by contrasting the perceptions of nursing assistants and managers of workplace health and safety, work organization and psychosocial concerns, which needed to be addressed in order to undertake the planned intervention.

Zhang Y, Gore R, Punnett L. Relationships among employees' working conditions, mental health and intention to leave the job in long-term care centers. (under review: Journal of Applied Gerontology)

Addresses Aim 1, by identifying the potential impact of work organization stressors on intention to turnover, which should be accounted for in creating and evaluating the effect of employee health programs on work outcomes.

Enrollment Tables

Program Director/Principal Investigator (Last, First, Middle): Punnett, Laura

Inclusion Enrollment Report

This report format should NOT be used for data collection from study participants.

Study Title: Promoting Mental and Physical Health of Caregivers through Transdisciplinary Intervent

Total Enrollment: 29,811 Administrative data   **Protocol Number:**

Grant Number: 1U19 OH008857-

PART A. TOTAL ENROLLMENT REPORT: Number of Subjects Enrolled to Date (Cumulative) by Ethnicity and Race				
	Sex/Gender			
Ethnic Category	**Females**	**Males**	**Unknown or Not Reported**	**Total**
Hispanic or Latino	1,217	301	0	1,518 **
Not Hispanic or Latino	0	0	0	0
Unknown (individuals not reporting ethnicity)	24,249	4,044	0	28,293
Ethnic Category: Total of All Subjects*	25,466	4,345	0	29,811 *
Racial Categories				
American Indian/Alaska Native	83	21	0	104
Asian	861	221	0	1,082
Native Hawaiian or Other Pacific Islander	0	0	0	0
Black or African American	8,681	1,836	0	10,517
White	14,589	1,963	0	16,552
More Than One Race	0	0	0	0
Unknown or Not Reported	1,252	304	0	1,556
Racial Categories: Total of All Subjects*	25,466	4,345	0	29,811 *

PART B. HISPANIC ENROLLMENT REPORT: Number of Hispanics or Latinos Enrolled to Date (Cumulative)				
Racial Categories	**Females**	**Males**	**Unknown or Not Reported**	**Total**
American Indian or Alaska Native				
Asian				
Native Hawaiian or Other Pacific Islander				
Black or African American				
White				
More Than One Race				
Unknown or Not Reported	1,217	301	0	1,518
Racial Categories: Total of Hispanics or Latinos**	1,217	301	0	1,518 **

* These totals must agree.
** These totals must agree.

Program Director/Principal Investigator (Last, First, Middle): Punnett, Laura

Inclusion Enrollment Report

This report format should NOT be used for data collection from study participants.

Study Title: Promoting Mental and Physical Health of Caregivers through Transdisciplinary Intervent

Total Enrollment: 2,727 Questionnaires--cumulative **Protocol Number:**

Grant Number: 1U19 OH008857-

PART A. TOTAL ENROLLMENT REPORT: Number of Subjects Enrolled to Date (Cumulative) by Ethnicity and Race

Ethnic Category	Sex/Gender			
	Females	**Males**	**Unknown or Not Reported**	**Total**
Hispanic or Latino	178	45	10	233 **
Not Hispanic or Latino	1,858	202	40	2,100
Unknown (individuals not reporting ethnicity)	310	40	44	394
Ethnic Category: Total of All Subjects*	2,346	287	94	2,727 *
Racial Categories				
American Indian/Alaska Native	19	2	2	23
Asian	57	8	3	68
Native Hawaiian or Other Pacific Islander	0	0	0	0
Black or African American	871	137	37	1,045
White	1,190	103	17	1,255
More Than One Race	72	15	1	88
Unknown or Not Reported	137	22	34	193
Racial Categories: Total of All Subjects*	2,346	287	94	2,727 *

PART B. HISPANIC ENROLLMENT REPORT: Number of Hispanics or Latinos Enrolled to Date (Cumulative)

Racial Categories	**Females**	**Males**	**Unknown or Not Reported**	**Total**
American Indian or Alaska Native	2	1	0	3
Asian	7	4	0	11
Native Hawaiian or Other Pacific Islander	0	0	0	0
Black or African American	35	7	4	46
White	41	10	2	53
More Than One Race	15	7	0	22
Unknown or Not Reported	78	16	4	98
Racial Categories: Total of Hispanics or Latinos*	178	45	10	233 **

* These totals must agree.
** These totals must agree.

Inclusion of gender and minority study subjects: Women and members of ethnic minorities were included in proportion to their presence in GHCC and specifically in the skilled nursing centers where surveys were conducted. As shown in the Enrollment Tables, about 85% of the workforce is female, which is consistent with the long-term healthcare sector generally; women were almost 90% of the survey participants. African-Americans represent about 35% of the GHCC workforce and comprised 38% of survey participants. About 5% of the GHCC workforce is Latino and 8.5% of survey participants were Latino.

Inclusion of Children: Children were generally not involved in this study; specifically, workers younger than 21 years were not offered survey questionnaires or observed at work for job analyses. However, any workers under 21 years of age who experienced back injuries and filed workers compensation claims would be included in the analyses of claim rates and costs. The study findings could be relevant for children who work as nursing assistants or in other direct care jobs in the long-term health care sector; there is no reason to assume that they would not also benefit from the implementation of safe resident handling programs.

List of Appendices

WE THANK YOU IN ADVANCE FOR
COMPLETING THIS QUESTIONNAIRE!
This survey is for all clinical (direct care) staff:
Nursing aides, nurses, nurse managers, and unit clerks.

**Please answer all the questions even if you have already
filled out an earlier questionnaire for this project.**

Remember that all survey responses will be kept
completely confidential.
You are entitled to **compensation of $20**
for the time and effort that you spend filling out this form.

For each question, please either fill in the blank or shade the circle that matches your response like this:

Shade circles like this: ●   **Not** like this: ⊗ ⊘

If you change your mind about a response, please mark an X through the wrong answer(s).

FIRST WE HAVE SOME QUESTIONS ABOUT YOUR GENERAL HEALTH:

Today's Date: ☐☐ / ☐☐ / ☐☐☐☐ (Month/Day/Year)

1. What is your height without shoes? Please answer in feet/inches **OR** meters.

   ☐ ' ☐☐ . ☐ "   **OR**   ☐ . ☐☐ meters

2. What is your weight without shoes? Please answer in pounds **OR** kilograms.

   ☐☐☐ pounds   **OR**   ☐☐☐ . ☐ kilograms

3. In general, would you say your health is:

   O Excellent   O Very good   O Good   O Fair   O Poor

4. Has a doctor or other healthcare provider told you that you have <u>currently</u> any of the following conditions?
   If so, is this condition currently being treated?

a) Elevated blood sugar or diabetes:	O Yes	O No
Is it currently being treated with medication?	O Yes	O No
b) High blood pressure/hypertension:	O Yes	O No
Is it currently being treated with medication?	O Yes	O No
c) Elevated cholesterol level:	O Yes	O No
Is it currently being treated with medication?	O Yes	O No
d) Low back disease or spine problems?	O Yes	O No

5. Have you <u>ever</u> had any of the following surgical procedures?

 | | | |
   |---|---|---|
   | a) Surgery on your lower back, including disc surgery? | O Yes | O No |
   | b) Knee surgery, including arthroscopic surgery? | O Yes | O No |

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☐☐☐☐☐

6. Please indicate the extent to which you <u>agree or disagree</u> with each of the following statements (shade one option for each):

	Strongly Disagree 1	2	3	4	5	Strongly Agree 6
a) If I become sick, I have the power to make myself well again.	O	O	O	O	O	O
b) I am directly responsible for my health.	O	O	O	O	O	O
c) Whatever goes wrong with my health is my own fault.	O	O	O	O	O	O
d) My physical well-being depends on how well I take care of myself.	O	O	O	O	O	O
e) When I feel ill, I know it is because I have not been taking care of myself properly.	O	O	O	O	O	O
f) I can pretty much stay healthy by taking good care of myself	O	O	O	O	O	O

7. During <u>the past 3 months</u>, have you had <u>pain or aching</u> in any of the areas shown on the diagram? Choose as many of these as apply to you:

O Low back (area 1)

O Shoulder (area 2)

O Wrist or forearm (area 3)

O Knee (area 4)

O Neck (area 5)

O Ankle or feet (area 6)

O None of the above
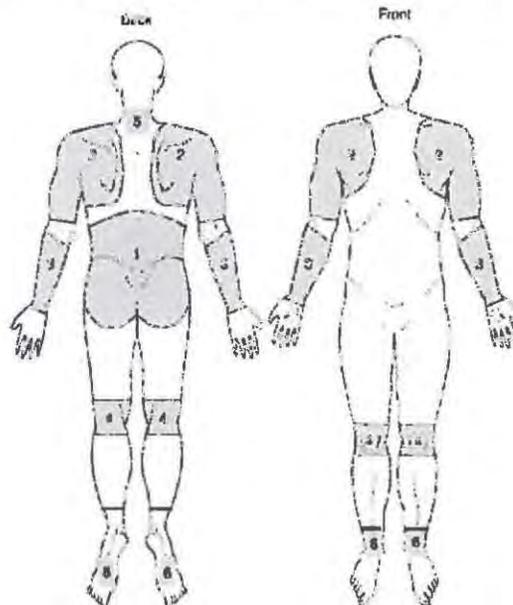
8. Please rate the <u>severity</u> of the following symptoms that you may have had in the <u>past week</u>:

	None	Mild	Moderate	Severe	Extreme
a) Pain in the low back	O	O	O	O	O
b) Arm, shoulder or hand pain	O	O	O	O	O
c) Tingling (pins and needles) in your arm, shoulder or hand	O	O	O	O	O
d) Pain in your legs or knees	O	O	O	O	O
e) Pain in your feet	O	O	O	O	O

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Please answer the following questions. Choose the answer to each question that comes closest to your situation. For any body area that doesn't bother you at all, just select "Does not apply."

9. How <u>often</u> have you had this problem <u>in the past 3 months</u>?

	Once in the last 3 months	About once every month	About once every week	Every day	Does not apply
a) Low back pain	O	O	O	O	O
b) Shoulder pain	O	O	O	O	O
c) Wrist or forearm pain	O	O	O	O	O
d) Knee pain	O	O	O	O	O

10. How <u>long</u> does the discomfort usually last <u>each time</u>?

	Less than 1 hour each time	More than 1 hour, but less than 1 day each time	More than 1 day, but less than 1 week	More than 1 week at a time	Does not apply
a) Low back pain	O	O	O	O	O
b) Shoulder pain	O	O	O	O	O
c) Wrist or forearm pain	O	O	O	O	O
d) Knee pain	O	O	O	O	O

11. How <u>long ago</u> did this problem <u>begin</u>?

	Within the last 3 months	Within the last 6 months	Within the last year	More than one year ago	Does not apply
a) Low back pain	O	O	O	O	O
b) Shoulder pain	O	O	O	O	O
c) Wrist or forearm pain	O	O	O	O	O
d) Knee pain	O	O	O	O	O

12. During the <u>past week</u>, to what extent has any <u>arm, shoulder or hand problem</u> interfered with your <u>normal social activities</u> with family, friends, neighbors or groups?

O Not at all   O A little bit   O Moderately   O Quite a bit   O Extremely

13. During the <u>past week</u>, were you limited in your <u>work or other regular daily activities</u> as a result of any <u>arm, shoulder or hand problem</u>?

O Not at all   O Slightly limited   O Moderately limited   O Very limited   O Unable to work or do other regular activites

14. During the <u>past week</u>, how much difficulty have you had <u>sleeping</u> because of any <u>arm, shoulder or hand problem</u>?

O No difficulty   O Mild difficulty   O Moderate difficulty   O Severe difficulty   O So much difficulty that I can't sleep

15. During the <u>past week</u>, to what extent has any <u>back or knee problem</u> interfered with your <u>normal social activities</u> with family, friends, neighbors or groups?

O Not at all   O A little bit   O Moderately   O Quite a bit   O Extremely

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16. During the past week, were you limited in your work or other regular daily activities as a result of any back or knee problem?

   O Not at all   O Slightly limited   O Moderately limited   O Very limited   O Unable to work or do other regular activites

17. During the past week, how much difficulty have you had sleeping because of any back or knee problem?

   O No difficulty O Mild difficulty O Moderate difficulty   O Severe difficulty   O So much difficulty that I can't sleep

18. Please rate your ability to do the following activities in the past week by shading the circle for the appropriate response:

	No difficulty	Mild difficulty	Moderate difficulty	Severe difficulty	Unable to do without help
a) Open a tight or new jar	O	O	O	O	O
b) Do heavy household chores, such as wash walls or floors	O	O	O	O	O
c) Carry a shopping bag or briefcase	O	O	O	O	O
d) Wash your back	O	O	O	O	O
e) Use a knife to cut food	O	O	O	O	O
f) Recreational activities in which you take some force or impact through your arm, shoulder or hand, such as golf, hammering, tennis, etc.	O	O	O	O	O
g) Use any hand-held tool or equipment, such as a telephone, pen, keyboard, computer mouse, drill, hairdryer, or sander	O	O	O	O	O
h) Sit for one hour or more	O	O	O	O	O
i) Stand for one hour or more	O	O	O	O	O
j) Reach into a back pocket	O	O	O	O	O
k) Reach for an object on an overhead shelf	O	O	O	O	O
l) Put on your shoes or socks	O	O	O	O	O
m) Get in or out of a car	O	O	O	O	O
n) Stoop or bend towards the floor	O	O	O	O	O
o) Wash or comb your hair	O	O	O	O	O
p) Kneel or squat	O	O	O	O	O
q) Go up stairs	O	O	O	O	O
r) Go down stairs	O	O	O	O	O
s) Lift or carry an object weighing at least 10 pounds	O	O	O	O	O

19. In general, during the past 4 weeks, how much did pain (in any body area) interfere with your normal work? (including both work outside the home and housework)

   O Not at all   O A little bit   O Moderately   O Quite a bit   O Extremely

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20. During the <u>past 4 weeks</u>, how many days have you been <u>absent from work</u> for any arm, shoulder, back, or knee problem? (includes unpaid days, paid sick days, and paid vacation days used for health reasons)

⬚⬚⬚ days

21. During the <u>past 4 weeks</u>, did you seek <u>medical care</u> for any arm, shoulder, back, or knee problem?

O Yes   O No

If <u>yes</u>, please estimate the cost of any "out of pocket" medical expenses (that you were not reimbursed for) for this care, such as co-payments, medicines, etc. (<u>Please answer to the nearest dollar</u>)

$ ⬚⬚⬚⬚ . 0 0 medical expenses in the past 4 weeks

We are interested in learning about how <u>your health</u> may have <u>affected you at work</u> during the past 2 weeks. If you are in good health, we would still like you to answer these questions.
(Choose *"Does not apply to my job"* <u>only</u> if the question describes something that is not part of your job.)

22. In the <u>past 2 weeks,</u> how much of the time did your physical health or emotional problems make it <u>difficult</u> for you to do the following?

	Difficult all of the time (about 100%)	Difficult most of the time	Difficult some of the time (about 50%)	Difficult a slight bit of the time	Difficult none of the time (0%)	Does not apply to my job
a) Keep your mind on your work	O	O	O	O	O	O
b) Think clearly when working	O	O	O	O	O	O
c) Do your work carefully	O	O	O	O	O	O
d) Easily read or use your eyes when working	O	O	O	O	O	O
e) Speak with people in person, in meetings or on the phone	O	O	O	O	O	O
f) Control your temper around people when working	O	O	O	O	O	O
g) Help other people to get work done	O	O	O	O	O	O
h) Handle the workload	O	O	O	O	O	O
i) Work fast enough	O	O	O	O	O	O
j) Finish work on time	O	O	O	O	O	O
k) Do your work without making mistakes	O	O	O	O	O	O
l) Feel you've done what you are capable of doing	O	O	O	O	O	O

23. Does your health limit you in <u>moderate activities</u>, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf?

O Yes, limits a lot   O Yes, limits a little   O No, does not limit at all

24. Does your health limit you in <u>climbing</u> several flights of stairs?

O Yes, limits a lot   O Yes, limits a little   O No, does not limit at all

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25. During the <u>past 4 weeks</u>, how much of the time have you had any of the following problems with your work or other regular daily activities <u>as a result of your physical health</u>?

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a) Accomplished less than you would like	O	O	O	O	O
b) Were limited in the kind of work or other activities	O	O	O	O	O

26. During the <u>past 4 weeks</u>, how much of the time have you had any of the following problems with your work or other regular daily activities <u>as a result of any emotional problems</u> (such as feeling depressed or anxious)?

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a) Accomplished less than you would like	O	O	O	O	O
b) Did work or other activities less carefully than usual	O	O	O	O	O

27. These questions are about how you feel and how things have been with you during the <u>past 4 weeks</u>. For each question, please give the one answer that comes closest to the way you have been feeling.

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
How much of the time during the past 4 weeks:					
a) .... have you felt calm and peaceful?	O	O	O	O	O
b) .... did you have a lot of energy?	O	O	O	O	O
c) .... have you felt downhearted and depressed?	O	O	O	O	O
d) .... has your physical health or emotional problems interfered with your social activities (like visiting friends, relatives etc.)?	O	O	O	O	O

28. In the <u>past 12 months</u>, have you had any <u>serious injury</u> to any of the body areas mentioned below? This includes injury from any cause (sports, workplace accident, automobile accident, assault, etc.). Please shade the circle of each body area where you have been injured this year:

    O Low back   O Shoulder   O Wrist or forearm   O Knee   O None of these

29. In the <u>past 3 months</u>, have you been <u>hit, kicked, grabbed, shoved, pushed or scratched</u> by a patient, patient's visitor or family member while you were at work?

    O No, not at all in the   O Yes, one time   O Yes, 2 times   O Yes, 3 times   O Yes, more than 3 times
       past 3 months   in the past 3 months

30. How would you describe your cigarette smoking habits?

    O Current smoker   O Former smoker   O Never smoked

If you are a <u>current smoker</u>, how many cigarettes or other tobacco products do you smoke or use <u>on an average day</u>? (NOTE: 1 pack equals 20 cigarettes)

    [|] cigarettes or   [|] other tobacco products

31. If you are a <u>current or former smoker</u>, please indicate how <u>ready</u> you are to stop smoking or using tobacco:

O No present interest   O Plan to change in   O Plan to change   O Recently stopped   O Already
   in making a change   the next 6 months   this month   smoking   non-smoker

32. Where is your main meal of the day usually prepared?

O at home   O in a cafeteria or "fast food" restaurant   O somewhere else

We would now like to know more about your attitudes and expectations <u>about some health-related behaviors and activities.</u>

33. Please indicate how <u>confident</u> you are that you could really motivate yourself to do the following <u>consistently for at least six months</u>, even if you are depressed, stressed in your job, or have high family demands. (Please choose <u>ONE</u> answer that best describes how you feel, whether or not you are presently doing any of the activities.)

|	Not confident	Somewhat confident	Moderately confident	Very confident
a) ... avoid eating high fat foods	O	O	O	O
b) ... eat a diet high in fruits and/or vegetables (meaning 5 or more servings per day)	O	O	O	O
c) ... lose weight and/or maintain ideal weight	O	O	O	O
d) ... exercise (fast walking, jogging, bicycling, swimming, etc.) three times a week, for at least 20 minutes each time	O	O	O	O
e) ... reduce the amount of stress in my daily life	O	O	O	O
f) ... avoid smoking cigarettes	O	O	O	O
g) ... avoid alcohol or drink in moderation (no more than 1 drink a day for women, 2 for men)	O	O	O	O
h) ... get a full night's sleep every night	O	O	O	O
i) ... meet most of the demands in my job	O	O	O	O

34. Please indicate if you <u>have</u> - during the last three months - <u>changed</u> how often you do any of the following:

	I do this much less than I used to	I do this a little less than I used to	No change in past 3 months	I do this a little more often than I used to	I do this much more often than I used to
a) ... eat high fat foods	O	O	O	O	O
b) ... eat a diet high in fiber	O	O	O	O	O
c) ... try to lose weight	O	O	O	O	O
d) ... exercise	O	O	O	O	O
e) ... have stress in my life	O	O	O	O	O
f) ... smoke cigarettes or use tobacco *	O	O	O	O	O
g) ... drink alcohol	O	O	O	O	O
h) ... get a full night's sleep	O	O	O	O	O

* Answer "no change in past 3 months" if you have been a non-smoker for at least 3 months
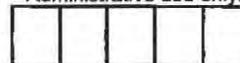
35. At what hour do you typically go to sleep during the work week? ☐☐ : ☐☐ O AM O PM

36. At what hour do you typically get up during the work week? ☐☐ : ☐☐ O AM O PM

37. How many hours of sleep do you usually need to have good functioning the next day? (Please choose one)
O 6 hours or less   O 7 hours   O 8 hours   O 9 hours   O 10 hours or more

38. How would you describe the quality of your sleep on a typical night? (Please choose one)
O Good   O Fairly good   O Fairly poor   O Poor   O Can't say

WORK AND WORK HISTORY

39. Please choose the one category which best describes the usual work schedule for your job at this facility:
O Permanent day shift   O Permanent evenings shift   O Permanent night shift
O Rotate days and evenings   O Rotate days and nights   O Rotate all 3 shifts

O Other (describe): _____

40. What is the usual length of your scheduled work shift? (If you work 8 hours put 8.0; if you work 7 1/2 hours put 7.5, etc.) ☐☐ . ☐ hours

The next 3 questions ask about a typical **TWO** weeks at work. Even if you have a one-week pay period, please answer these questions for a two-week period.

41. In a typical 2-week period, how many hours do you actually work altogether (including overtime) at this facility? ☐☐☐ hours

42. In a typical 2-week period, how many days do you actually work at this job? ☐☐ days

43. In a typical 2-week period, how often do you float to another unit?
O Not at all   O About once per week   O More than 1 shift in the week

44. Next we have some questions about your current job in this Genesis facility. For each of the next statements, please shade ONE circle for the answer that comes closest to describing this job:

	Strongly disagree	Disagree	Agree	Strongly agree
a) I am often required to move or lift very heavy loads (objects or people) on my job.	O	O	O	O
b) My work requires rapid and continuous physical activity.	O	O	O	O
c) I am often required to work for long periods with my body in physically awkward positions.	O	O	O	O
d) I am often required to work for long periods with my head or arms in physically awkward positions.	O	O	O	O
e) I am often required to squat or kneel to do my job.	O	O	O	O
f) My job requires that I learn new things.	O	O	O	O
g) My job requires me to be creative.	O	O	O	O
h) My job allows me to make a lot of decisions on my own.	O	O	O	O
i) On my job, I have very little freedom to decide how I do my work.	O	O	O	O
j) I get to do a variety of different things on my job	O	O	O	O

44. *Continued* questions about <u>your current job</u> in this Genesis facility. For each of the next statements, please shade ONE circle for the answer that comes closest to describing this job:

	Strongly disagree	Disagree	Agree	Strongly agree
k) I have a lot of say about what happens on my job.	O	O	O	O
l) My job requires a high level of skill	O	O	O	O
m) My job requires working very fast.	O	O	O	O
n) My job requires working very hard.	O	O	O	O
o) I am not asked to do an excessive amount of work.	O	O	O	O
p) I have enough time to get my job done	O	O	O	O
q) My supervisor is helpful in getting the job done.	O	O	O	O
r) My supervisor pays attention to what I am saying.	O	O	O	O
s) The people I work with take a personal interest in me.	O	O	O	O
t) The people I work with can be relied on when I need help	O	O	O	O
u) The people I work with encourage each other to work together.	O	O	O	O
v) My opinion matters when people are trying to figure out why something went wrong	O	O	O	O
w) My job security is good.	O	O	O	O
x) Employees have the appropriate supplies, materials, and equipment to perform their jobs well	O	O	O	O
y) I am often required to do a task that makes me feel like I might be at risk of getting hurt.	O	O	O	O
z) My work area is adequately staffed	O	O	O	O
aa) People working in my department or unit are frequently exposed to dangerous or risky situations.	O	O	O	O
bb) In this facility, management considers workplace health and safety to be important	O	O	O	O
cc) This organization practices zero tolerance for discrimination.	O	O	O	O
dd) I have a lot of say about how many hours I work per week, including overtime.	O	O	O	O
ee) I have a lot of say about which shifts I work (day, afternoon, or evening).	O	O	O	O
ff) I am likely to leave this job in the next two years	O	O	O	O
gg) After work I come home too tired to do some of the things I'd like to do.	O	O	O	O
hh) On the job, I have so much work to do that it takes away from my personal interests	O	O	O	O
ii) My family and/or friends dislike how often I am preoccupied with my work while I am at home.	O	O	O	O
jj) My supervisor(s) understand and support my family or other personal responsibilities	O	O	O	O
kk) Considering all my efforts and achievements, I receive the respect that I deserve at work.	O	O	O	O

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45. Please indicate if you usually do <u>more, less, or the same</u> amount of <u>lifting</u> as other people in the same job title and unit as you. Shade the option that comes closest to describing your job:

	A lot less than others	About the same	A lot more than others	Not part of my job
a) Lifting or moving heavy things, such as loaded carts or full waste bags	O	O	O	O
b) Lifting residents	O	O	O	O

46. Do you <u>supervise</u> other people as part of your job?

     O No   O Yes, 1-4 people   O Yes, 5-10 people   O Yes, 11-20 people   O Yes, more than 20

47. In the <u>last 12 months,</u> have any of the following occurred for you? (Please choose all that apply)

     O Change in job location   O Change in job title

     O Change in working group   O Change in supervisor

     O Significant change in work schedule   O Significant increase in work load

                                       O Significant decrease in work load

48. What is your current job title?

     O CNA   O GNA   O CMA   O LPN   O RN   O Other

     If other please specify: _____

49. <u>Over your lifetime</u>, about how many years have you done the <u>same type</u> of work that you do at this Genesis facility?   [|] years or [|] months

50. <u>Over your lifetime</u>, about how many years have you worked in <u>any kind</u> of job (including the job you have now at Genesis)?   [|] years or [|] months

51. If you have worked <u>less than one year</u> in this job at this facility, what type of work were you doing earlier in the year? Please fill in all that apply.

     O Healthcare: similar job to this one

     O Healthcare: Home care

     O Healthcare: different type of job

     O Student

     O Homemaker

     O Other - please specify _____

     O Not applicable (I have worked one year or more at this job)

52. How <u>long</u>, in total, did you work in that previous job? [|] years [|] months

YOU'RE DOING GREAT! KEEP GOING!

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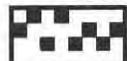
53. Do you have any other paid job?   O Yes   O No

    If YES (you do have another paid job):

      a) How many hours per week do you usually spend at that other job(s)? ☐☐ hours

      b) Is it the same type of work as you do in this Genesis facility?   O Yes   O No

      c) Is it home care?   O Yes   O No

      d) If that other job(s) is not in a health care
         facility, what kind(s) of business is it? _____

54. Now we have some questions about the Injury Reduction Program ("Get a Lift") that has recently begun in your workplace, and the patient lifting devices that have been brought in.

    Please indicate to what extent do you agree or disagree with the following statements:

	Strongly disagree	Disagree	Agree	Strongly agree
a) Co-workers support each other to use patient lifting devices.	O	O	O	O
b) It takes too long for employee suggestions about patient lifting to go through the proper channels	O	O	O	O
c) Employee suggestions about patient lifting are supported by management.	O	O	O	O
d) I alert other employees when they place themselves at risk during a patient lift.	O	O	O	O
e) Job duties on my unit often prevent employees from acting as safely as they would like.	O	O	O	O
f) My supervisor makes every effort to ensure that employees have what they need to be safe at work	O	O	O	O
g) I find it easy to get access to the patient lifting devices on my unit.	O	O	O	O
h) If patient lifting devices were used with every patient lift, the risk of getting injured would be very low.	O	O	O	O
i) Management is responsive to employee concerns about patient lifting.	O	O	O	O
j) When it comes to patient lifting, I am asked for my input on how I use my work space	O	O	O	O
k) I think that the Injury Reduction Program will help me and my co-workers avoid injuries in the future.	O	O	O	O

55. In general, when you move residents, how often do you use a lifting device?

    O Never

    O Rarely

    O Sometimes

    O Often

    O Always

56. If you don't use a patient lifting device every time that a resident has to be moved, what is the <u>main</u> reason?

   O The devices are not available or not functioning when needed

   O My co-workers do not use them

   O The devices take too much extra effort

   O I don't feel that I need them

   O I don't have enough time

   O Some residents don't like it

   O Other - please specify _____

GENERAL INFORMATION

57. What is your date of birth? ☐☐ / ☐☐ / ☐☐☐☐ (Month/Day/Year)

58. Are you male or female?   O Male   O Female

59. For classification purposes, do you consider yourself Latino or of Hispanic origin or descent?

   O Yes: includes Puerto Rican, Cuban American, Mexican American, etc.

   O No, not Latino/Hispanic/Spanish

60. For classification purposes, what is your racial background? (Shade one or more circles to indicate how you consider yourself).

   O White, European descent
   O Black, African American, African
   O American Indian or Alaska Native
   O Asian, Asian American: includes Filipino, Korean, Cambodian, Chinese, Japanese, Vietnamese, Laotian, Pacific Islander, etc.

   O Some other racial group: _____

61. Please shade the circle above one number for the <u>highest grade or year of school</u> that you have completed:

O	O	O	O	O	O	O	O	O	O
8 or less	9	10	11	12	13	14	15	16	17 or more
Less than High School		High School (secondary)			College/Professional				Post-Graduate

62. What is your current marital status?

   O Married or live with partner   O Widowed   O Divorced or separated   O Single, never married

63. How much responsibility do you personally have for <u>any children under 18</u> in your household?

   O There are no children under 18 at home

   O I have primary responsibility

   O I share responsibility with another adult(s)

   O Another adult has primary responsibility

Administrative use only!   21665
☐☐☐☐☐

64. Is there anyone in your family or household or living nearby who is elderly or has a long-term illness or disability and <u>depends on you for care</u>?　　O Yes　O No

65. <u>In a typical week</u>, how much time do you usually spend in heavy cleaning, yard work, gardening, home maintenance or renovation?

O None　　O Some time but less than 1 hour/week　　O Between 1 and 3 hours/week　　O Between 3 and 6 hours/week　　O Between 6 and 10 hours/week　　O More than 10 hours/week

66. At what age do you expect to retire from work? ☐☐ years old **OR** O Don't know

67. Some people feel older or younger than they are. How old do you <u>feel</u>? ☐☐ years old

68. What age would you like to be, if you could choose an age right now? ☐☐ years old

69. Do you believe that, from the standpoint of your health, you will be able to do your current job <u>two years from now</u>?

O Unlikely　　O Not certain　　O Relatively certain

70. How many <u>times a week</u> on average do you exercise to work up a sweat (at least 20 min per session, for example fast walking, jogging, bicycling, swimming, rowing, etc.)?

O None　　O Some, but less than once per week　　O Between 1 and 2 times per week　　O 3 times per week　　O More than three times per week

71. Please indicate how <u>ready</u> you are to be physically active every week:

O No present interest in making a change　　O Plan to change in the next 6 months　　O Plan to change this month　　O Recently started doing this　　O Already doing this regularly

The survey questions you have just answered are part of a study to find new ways of promoting employee health. If we missed something that you think affects your health or wellbeing, please tell us about it below. (In order to keep all information confidential please do not write names of co-workers or other employees in your answers below.)

72. If you think there is something about your job or workplace that has a <u>bad effect</u> on your health,

a) What is it about your job or workplace that is partially to blame?

b) What is the bad effect on your health?

73. If you think there is something about your job or workplace that has a good effect on your health,

    a) What is it about your job or workplace that deserves credit?

    b) What is the good effect on your health?

74. If you think there is something outside your workplace that has a bad effect on your health,

    a) What outside your job or workplace is partially to blame?

    b) What is the bad effect on your health?

Administrative use only!   21665

75. If you think there is something <u>outside your workplace</u> that has a <u>good effect</u> on your health,

    a) What outside your workplace deserves credit?

    b) What is the good effect on your health?

76. Thinking ahead two or three years, what would you consider to be an important improvement in your health compared to now? (For example; feeling more energetic, being able to participate in sports/exercise activities, having more restful sleep, fewer illnesses, etc.)

This is the end of this questionnaire. Thank you very much for your time and assistance with this study.

Please fill out and sign the "Informed Consent" and "Payment Voucher" forms to make sure that you receive this compensation!

Please return the completed questionnaire to one of the researchers from the University of Massachusetts, or mail it along with the signed informed consent form to:

Dr. Laura Punnett
Dept. of Work Environment
University of Massachusetts Lowell
One University Avenue
Lowell, MA 01854

21665

Table of Contents for Baseline, 3-month and 12- month follow-up questionnaires   12/2/2008

Variable/Domain	Instrument(s) where used	Variable name(s) from first instrument	Value or Scale name **Source** **Definition and formula for scale; rules for handling missing values**		Scaled variable name
GENERAL HEALTH					
Height	F0, F1, F2	Q1_feetF0, Q1_inchesF0	Feet & inches (or converted from meters: F1, F2)		
Weight	F0, F1, F2	Q2F0	Pounds OR kg (F1, F2). Convert height and weight to metric units if necessary for computing BMI: Body Mass Index (BMI): BMI=wt*kg/m2 Categories: Underweight[<18.5] (-1), Normal wt[18.5-25) (0), Overweight[25-30) (1), Obese [30-40)(2), Extremely obese (3)[>=40]		bmi_fx bmic_fx
Self-Rated Health: SF12 (12 items)	F0 F2 (not F1)	Q3F0 Q20F0, Q21F0 Q22aF0, Q22bF0 Q23aF0, Q23bF0 Q24aF0, Q24bF0 Q24dF0	General Health (GH): Q3F0 Physical Functioning (PF) : (Q20F0 + Q21F0) Role-Physical (RP): (Q22aF0 + Q22bF0) Bodily Pain (BP): (6-Q17F0) Role- Emotional (RE): (Q23aF0 + Q23bF0) Mental health (MH): [(Q24cF0 + (6-Q24aF0)] Social functioning (SF): Q24dF0 Vitality (VT): (6-Q 24bF0) Weighted PCS and MCS scores computed per algorithms in SF-12 manual, with z-scoring. Out of range values were recoded as missing. BP & VT: if value is missing then treat sub-scale as missing. Other sub-scales: if one value is missing then it is replaced by the other.		PCS_fx MCS_fx
Diabetes, Hypertension, High Cholesterol (2 items each: diagnosis, current treatment)	F0, F1, F2	Q4a1F0, Q4a2F0 Q4b1F0,Q4b2F0 Q4c1F0, Q4c2F0	One variable for each of 3 conditions, combining diagnosis and treatment: 0 =No disease, no treatment or missing treatment 1= Yes to condition, but no treatment (or missing) 2= Treatment received currently .= Diagnosis missing and no treatment	Composite disease: Yes = Yes to diagnosis OR treatment of any of the 3 No = No (not missing) for all 3	diabetesfx hyperfx cholfx diseasefx
Low back/spine problems	F0, F1, F2	Q4dF0, Q5aF0	YES if Yes to either low back diagnosis (4d) or surgery (5a) Else NO if No to both		lowbackfx

Composite chronic condition	F0, F1, F2		Yes if any conditions diabetesfx, hyperfx, cholfx or lowbackfx hold, no if all conditions no, missing otherwise	chronicfx

HEALTH BELIEFS

Internal Health Locus of Control (6)	F0	Q7aF0 – Q7fF0	IHLOC = Sum of all 6 responses Two missing values permitted, to be replaced with mean of non-missing items (Wallston K. et al., 1979)	Ilocfx
Health Self Efficacy (9 items)	F0	Q51aF0 – Q51iF0	Sum of all responses No missing values permitted. (Higher scores indicate greater confidence in generalized self-efficacy.) [NOTE: 2 versions used! First 3 centers in MD did not have these items; V 1 used in next 2 centers; V 2 used in last 3 in MD, plus all subsequent centers.] Source: Bandura (1997); http://www.crowdbcm.net/measures/Measures-II-Psychosoc.htm#gense	hsef0_v1 hsef0_v2 hsefx
Health Value (4)	F0	Q52aF0 Q52bF0 Q52cF0 Q52dF0	Mean of all 4 responses Q52bF0 & Q52cF0: reverse coding Two missing values permitted, replaced with the mean (Lau & Hartman 1986). [NOTE: First 3 centers in MD did not have these items.]	hvaluefx
Health Outcome Expectations (6)	F1 (only)	Q28a1F1 Q28a2F1 Q28b1F1 Q28b2F1 Q28c1F1 Q28c2F1	Mean of all 6 responses Only on F1 survey. One missing allowed for now replaced with mean -- Source: L Punnett & H Miranda	houtf1

MSDs & FUNCTIONAL LIMITATIONS

MSD cases: Low back, Shoulder, Wrist/forearm, Knee	F0, F1, F2	Q8aF0-Q8dF0, Q9aF0–Q9dF0	Case at each body region: See Case definition document YES: if pain = yes and severity ≥ 3 NO: if pain = no or severity < 3 . : if both pain and severity are missing	backfx shldfx handfx kneefx
Symptom MSD cases	F0, F1, F2	Q8aF0-Q8dF0, Q9aF0–Q9dF0	Had moderate to extreme severity but no pain reported in Q8 Also **ue_unspecfx** and **le_unspecfx** for those with moderate+ severity but can't identify the exact body part for the pain.	backSXfx ueSXFx le SXfx
	F0, F1, F2	Q16aF0 – Q16sF0	Functional limitations / IADLs – these items overlap multiple scales. Some were taken from SPADI, UAW-C, WLQ, etc., but don't match any existing scale exactly. 16 of the total of 19 items were also used in the PHASE OBQ.	

Quick DASH: Upper Extremity (11 items)	F0, F1, F2	Q9bF0 Q9cF0 Q10F0 Q11F0 Q12F0 FQ16aF0 - FQ16fF0	QD = {(mean of responses) – 1} x 25 (This scales to 0-100) One missing value permitted; de facto replaced by mean of non-missing. Out of range values – set to missing Source: DASH, Institute for Work and Health (http://www.dash.iwh.on.ca/assets/images/pdfs/q_q.pdf)	qdashfx
Other UE scale (5 items)	F0, F1, F2	Q16gF0, Q16jF0, Q16kF0, 16oF0, Q16sF0	Mean of all responses One missing value permitted	oth_uefx
Total Upper Body Scale (16 items)	F0, F1, F2	All items in above 2 scales	Analog to DASH: {average (non-missing)-1} x 25 Two missing values permitted, de facto replaced by mean of non-missing.	tot_uefx
Western Ontario McMaster Osteoarthritis Index (WOMAC) (8 items)	F0, F1, F2	FQ16bF0 FQ16hF0 FQ16iF0 FQ16lF0 FQ16mF0 FQ16nF0 FQ16qF0 FQ16rF0	Sum of all responses Two missing values permitted, *de facto* replaced by mean of non-missing. Source: Bellamy	womacfx
Lower Body Scale (Back and Lower Extremity Combined) (15 items)	F0, F1, F2	All WOMAC items plus: FQ9aF0 FQ9dF0 FQ13F0 FQ14F0 FQ15F0 Q16pF0 Q16sF0	Analog to DASH: {average (non-missing)-1} x 25 Two missing values permitted, *de facto* replaced by the mean. Source: L. Punnett, PHASE	wb_le_scorefx
Work Limitation Questionnaire: 2 sub-scales only (12 items)	F1 F2	Q23aF1- Q23lF1F1	Mental-Interpersonal Sub-scale= Average of (Q23aF1...Q23gF1) Output Subscale= Average of (Q23hF1...Q23lF1) Fewer than 4 missing values permitted per Mental-Interpersonal Scale. Fewer than 3 missing values permitted for Output Scale. Impute missing values from the mean of non-missing. Transform each scale to 0-100 (according to formula in Technical Document, p. 4). Source: Debra Lerner et al. (2000)	wlq_mid_fx wlq_od_fx

WORK ENVIRONMENT AND WORKING CONDITIONS				
Physical Demand (5)	F0, F1, F2	Q33aF0-Q33eF0	Phys D = Mean of 5 items 1 missing value permitted; replaced with the mean of non-missing values. Source: JCQ (4 items: Q33aF0-Q33dF0) and PHASE (1 item: Q33eF0)	phyexertfx
Psychological Job Demands (JCQ subset) (2)	F0, F1, F2	Q33fF0 Q33gF0	Psych Demand = Sum of Q33fF0 + (5- Q33gF0) No missing values permitted 1 item reverse coded JCQ short version: subset by N. Warren [see Landsbergis]	psydemandfx
Decision Latitude (JCQ subset)	F0, F1, F2	Q33hF0, Q33iF0	DL = Sum of Decision Authority ('h') + Skill Discretion ('i') No missing values permitted JCQ short version: subset by N. Warren [see Landsbergis]	declatfx
Social Support (JCQ subset)	F0, F1, F2	Q33jF0 -Q33mF0	Coworker Support = Sum of 'j' and 'k' Supervisor Support = Sum of 'l' and 'm' Soc Sup = Coworker Support + Supervisor Support No missing values permitted JCQ short version: subset by N. Warren [see Landsbergis]	coworksupfx supsupfx socsupfx
Safety Climate (4)	F0, F1, F2	Q33nF0 Q33oF0 Q33qF0 Q33rF0	Mean of 4 items, with 2 reverse coded (n, q) => higher score means better safety climate. 1 missing value permitted; replaced with the mean of non-missing values. Source: Two items from Griffin ('q' for physical environment; 'r' for management values). (These were 4 of the 8 used in PHASE: EBQ #60, 61, 62, 66)	Safe_climfx
Schedule Control (2)	F0, F1, F2	Q33sF0, Q33tF0	Sum of 2 items ('s' and 't') No missing values permitted Source: derived from Buessing; used in PHASE	scontrolfx
Work-family imbalance (3)	F0, F1, F2	Q33vF0 Q33wF0 Q33xF0	WFI = Average of 3 items (v, w, x) One missing value permitted Source: Gutek 1991 (3 of 4 items in WIF scale); used in PHASE	wfifx

IRB INFORMED CONSENT or AGREEMENT TO PARTICIPATE FORM
IRB No.:06-1403   Rev. No./Date: 4/20/10

(A copy of this form must be provided to the study participant after signing it. The original is retained by the PI.)

Project Title: Promoting Physical and Mental Health of Caregivers through Trans-Disciplinary Intervention
Form A1: Questionnaire and/or direct observation (v 2)
Principal Investigator: Laura Punnett, Sc.D
Contact Information: Telephone: 978-934-3269, Facsimile: 978-452-5711, E-mail: Laura_Punnett@uml.edu
Co-Researcher(s): Marian Flum, Rebecca Gore, Supriya Lahiri, Suzanne Nobrega
Date Submitted: April 20, 2010

This form has been approved for use by the UMass Lowell IRB and is valid for a period not to exceed one year from the approval date.

Authorized IRB Approval Signature: *Stephen Moze*   **Approval Date:** *April 21, 2010*

The following are essential elements of Informed Consent (these section titles may be edited to suite your needs but the information for each element must be included):

1. Study Purpose: You are being asked to take part in a research study sponsored by the U.S. National Institute for Occupational Safety and Health about the range of factors that affect the health of healthcare workers, including the effects of programs in the workplace.

2. Procedure and Duration: You will be asked to take part in one or both of the following study activities:

a) Complete a written questionnaire about your job, your health, and other personal characteristics, and similar questionnaires in the future, for follow-up purposes. Each one will take about 20 minutes to fill out. (You will of course be free to accept or refuse each time a questionnaire is offered.)

b) Be observed while you work. (You might also be photographed while working, if you agree.) This will help us to learn about things like how long different work tasks take and how your body is positioned.

3. Potential Risks and Discomfort: There are no significant risks involved in being a participant in this study. Your employer has agreed to participate in this study and supports your participation in the research. Your employer will not receive any personal health information obtained in this study identifying you as the participant. Every possible effort will be made to protect your privacy (see next page for more details).

4. Incentives/Compensation (if any): Each person who completes and returns a written survey questionnaire will receive compensation of $20. Each person who agrees to be observed on the job will receive compensation of $5, or $10 for both the questionnaire and observations.

5. Anticipated Benefits to the Subject or to Non-subjects: Your participation in this study will assist us in learning more about the causes of musculoskeletal disorders and other health concerns. You and other participants will be helping to improve the future health of healthcare workers.

6. Right to Refusal or Withdrawal of Participation: Participation in this study is completely voluntary, and your participation, or non-participation, will not affect your job status. You may stop your participation in this research program at any time without penalty. You may also choose to not participate in certain parts of the research that you are not comfortable with.

7. Assurances of Privacy and Confidentiality: Every precaution will be taken to protect your privacy and the confidentiality of information you give to the project. Survey questionnaires, photographs of workers, and observation notes will be available only to members of the research team. Your name will never be used in any report of the research. All personal data gathered will be aggregated for reporting purposes, with no identifiers for individual participants. Participants will be identified by a confidential identification number, and all survey materials will be kept in locked file cabinets and password-protected computer files.

8. Additional Information: If you do not understand any part of what you are being asked to do, or the contents of this form, the researchers are available to provide a complete explanation. Questions relating to this research project are welcome at any time. Please direct them to Dr. Laura Punnett, the Principal Investigator of this project:

> Dr. Laura Punnett
> Department of Work Environment
> University of Massachusetts Lowell
> One University Avenue
> Lowell, MA 01854
>
> Telephone: 978-934-3269
> Facsimile: 978-452-5711
> E-mail: Laura_Punnett@uml.edu

PRINCIPAL INVESTIGATOR SIGNATURE(S)

Printed Name: Laura Punnett   Signature: Date:

PERSON OBTAINING CONSENT

Printed Name: Signature: Date:

PARTICIPANT SIGNATURE

I understand the foreseeable risks and/or discomfort that have been described in this document. I have read the statements contained herein, have had the opportunity to fully discuss my concerns and questions, and fully understand the nature and character of my involvement in this research program as a participant and the attendant risks and consequences.

Research Participant:

Printed Name: _____   Signature: _____

Date: _____

Skilled nursing employee satisfaction survey reference

ITEM NUMBER/LABEL	ORIGINAL SURVEY STATEMENT

GLOBAL SATISFACTION DOMAIN
19	Overall satisfaction	How would you rate your overall satisfaction with this facility?
20	Recommendation for job	What is your recommendation of this facility as a place to work?
21	Recommendation for care	What is your recommendation of this facility as a place to receive care?

WORK ENVIRONMENT DOMAIN
Rate this facility on ...

5	Comparison of pay	The pay as compared to other facilities
11	Safety of workplace	The safety of the workplace
12	Adequacy of equipment/supplies	The adequacy of equipment and supplies to do your job
13	Sense of accomplishment	How your work allows you to make a difference in people's lives
14	Quality of teamwork	How your co-workers work together as a team
15	Fairness of evaluations	The fairness of your performance evaluations
16	Respectfulness of staff	The respect shown to the resident by staff
17	Assistance with job stress	Helping you to deal with job stress and burnout
18	Staff-to-staff communication	Staff communication between shifts

TRAINING DOMAIN
Rate this facility on ...

1	Quality of orientation	The quality of new staff orientation
2	Quality of in-service education	The quality of in-service education
3	Quality of resident-related training	The quality of training you receive to deal with difficult residents
4	Quality of family-related training	The quality of training you receive to deal with difficult family members

SUPERVISION DOMAIN
Rate this facility on ...

6	Care (concern) of supervisor	How your direct supervisor cares about you as a person
7	Appreciation of supervisor	How your direct supervisor regularly shows you appreciation for a job well done
8	Communication by supervisor	How your direct supervisor regularly gives you important work-related information

MANAGEMENT DOMAIN
Rate this facility on ...

9	Attentiveness of management	How well facility management listens to employees
10	Care (concern) of management	How facility management cares about employees

DEMOGRAPHICS AND BACKGROUND INFORMATION
22	Age of employee	What is your age?
23	Gender of employee	What is your gender?
24	Job category	What is your job category?
25	Shift typically worked	Which shift do you normally work?
26	Length of employment	How long have you worked at this facility?
27	Homes worked in 3 years	How many nursing homes have you worked at during the last three years?
28	English as first language	Do you speak English as your first language?
29	Hours worked in typical week	How many hours during a typical week do you normally work at this facility?

NIOSH Project Nursing Center Administrator Survey

This survey is to be completed by Nursing Center administrators or their designees in Genesis Centers. This survey is part of the NIOSH research project the University of Massachusetts Lowell is conducting linking worker safety and worksite health promotion. The survey is intended to provide information about the organizational design and culture of Genesis centers. Your input is extremely valuable. This survey should only take 12-15 minutes to complete.

Privacy and Confidentiality:

Every precaution will be taken to protect your privacy and the confidentiality of information you give to the project. Your answers will not be seen by anyone else at Genesis. Your responses will be available only to members of the research team. Your name will never be used in any report of the research. All personal data will be aggregated for reporting purposes, with no identifiers for individual participants. Participants will be identified by a confidential identification number, and all survey materials will be kept in a locked file cabinet and password-protected computer files. Please note that there are 3 web pages to this survey. When you complete a page, just click the right arrow to get to the second or third pages.

Your responses will go directly to researchers at UMass Lowell, who will maintain complete confidentiality. Your answers will not be seen by your supervisor. This survey will NOT be used to evaluate your performance.

Please note that there are 3 web pages to this survey. When you complete a page, just click the right arrow to get to the second or third pages.

1

Today's Date

	Month	Day	Year	Time
Date/Time				

2

Name

3

Position

4

    Years in Position

5

    Nursing Center

6

    Business Unit

7

    Center Location (City, State)

COMMUNICATION

8

    How often do you interact with CNAs?

    ■ Daily

    ■ Several times a week

    ■ Weekly

    ■ Monthly

    ■ Less than once a month

9

How do CNAs learn about patient diagnosis, change in routine, change in treatment, or about concerns from a previous shift? Please mark the method that is most common.

- Chart
- Informed at beginning of shift by supervisor
- Informed at beginning of shift by co-worker
- Team meeting
- None of the above
- Other, please specify

10

If a worker has a concern about the following, how is it handled? Please mark All answers that apply for each concern listed below.

1 Reported to Supervisor	2 Reported to Administrator	3 Referred to a Committee	4 A Specific Investigative Process is Followed	5 Other
Work assignment issues				
1	2	3	4	5
Patient Care				
1	1	3	4	5
Health & Safety				
1	2	3	4	5

11

What is the typical or average response time to an employee concern about each of the following? Please mark the ONE answer that best applies for each concern listed below.

1 3 Days or Less	2 1 Week or Less	3 2 Weeks or Less	4 Within 1 Month	5 Other

Work assignment issues

| 1 | 2 | 3 | 4 | 5 |

Patient Care

| 1 | 2 | 3 | 4 | 5 |

Health & Safety

| 1 | 2 | 3 | 4 | 5 |

12

A patient falls during handling. The supervisor has been notified, a report has been filed, and an incident investigation has been initiated. What additional measures might be taken in response to this incident? Please select those that are most important, but NO MORE than 3 total.

☐ Discussion with supervisor

☐ The staff member involved is reprimanded

☐ A team meeting is called to discuss why this happened

☐ Procedures are put into place to prevent this from occurring in the future

☐ Specific measures are initiated to support the staff member involved (retraining, job transfer, etc.

☐ Other, please specify

13

A resident becomes argumentative and verbally abusive to a CNA. The CNA leaves the room in tears and refuses to go back into the room. the supervisor has been notified; a report has been filed; an incident investigation has been started. What additional measures might be taken in response to this incident? Please select those that are most important, but NO MORE than 3 total.

☐ Discussion with supervisor

☐ Staff member involved is reprimanded

☐ A team meeting is called to discuss why this happened

☐ Procedures are put into place to prevent this from occurring

☐ Procedures are put into place to prevent this from occuring in the future

☐ Specific measures are initiated to support the staff member involved (retraining, job transfer, etc.)

☐ Other, please specify

WORKER PARTICIPATION

14

How is CNA input solicited or encouraged? Please check all that apply.

☐ No formal process

☐ Suggestion box

☐ At staff meetings

☐ At team meetings

☐ Safety committee

☐ Ergonomics committee

☐ Employee relations/ staff excellence committee

☐ Through cross-discipline committees

☐ Through quality improvement teams

☐ Other, please specify

15

To what extent have employees suggestions or other input resulted in changes or innovations in the facility?

- Most innovations have come from employee input.

- A moderate number of innovations have come from employee input.

- A small number of innovations have come from employee input.

- No innovations have come from employee input.

16

Do clinical staff participate in any of the following? Please check ALL that apply.

- Determining the way in which they perform their assigned duties

- Work scheduling

- How they organize their work day

- Patient-related problem-solving

- Worker interpersonal problem-solving

- Other, please specify

For the following questions, please indicate the answer that best represents your facility for each group of clinical staff.

17

Efforts are made to **seek** input/suggestions/ideas from the following clincial staff about things like equipment purchases, equipment layout, etc. Supervisors or managers make the final decisions.

1	2	3	4	5
All of the time	Most of the time	Some of the time	A slight bit of the time	None of the time

RNs

| 1 | 2 | 3 | 4 | 5 |

LPNs

| 1 | 2 | 3 | 4 | 5 |

CNAs

| 1 | 2 | 3 | 4 | 5 |

18

The following clinical staff are involved in shared decision-making efforts with supervisors or management about things like equipment purchases, equipment layout, etc.

1 All of the time	2 Most of the time	3 Some of the time	4 A slight bit of the time	5 None of the time

RNs

| 1 | 2 | 3 | 4 | 5 |

LPNs

| 1 | 2 | 3 | 4 | 5 |

CNAs

| 1 | 2 | 3 | 4 | 5 |

19

Efforts are made to **seek** input/suggestions/ideas from the following clinical staff about things like how to process new patients, setting new work schedules, etc. Supervisors or managers make the final decisions.

1 All of the time	2 Most of the time	3 Some of the time	4 A slight bit of the time	5 None of the time

RNs

| 1 | 2 | 3 | 4 | 5 |

LPNs

| 1 | 2 | 3 | 4 | 5 |

CNAs

| 1 | 2 | 3 | 4 | 5 |

20

The following clinical staff are involved in shared decision-making efforts with supervisors or management about things like how to process new patients, setting new work schedules, etc.

1	2	3	4	5
All of the time	Most of the time	Some of the time	A slight bit of the time	None of the time

RNs

| 1 | 2 | 3 | 4 | 5 |

LPNs

| 1 | 2 | 3 | 4 | 5 |

CNAs

| 1 | 2 | 3 | 4 | 5 |

WORK ORGANIZATION

21

How are CNAs recognized and rewarded? Please check all that apply

☐ No formal process

☐ At staff meetings

☐ Congratulations or congratulatory letter

☐ Employee of the Month

☐ Special gifts

Awards

None of the above

Other, please specify

22

Does your center provide on-site opportunities or subsidize training for all staff to: Please check all that apply

Increase knowledge and skills

Advance career

Cope with job demands

Increase workplace health and safety

Improve patient care

Improve Quality

Conflict resolution

Earn adult education or college credits

None of the above

Other, please specify

SUBMIT

Survey Page 1

NIOSH Project Nursing Center Administrator Survey

23

Employees receive regular feedback on their performance...

- ☐ At least monthly
- ☐ At least quarterly
- ☐ Twice a year
- ☐ Once a year
- ☐ There is no formal process

WORKPLACE HEALTH PROMOTION

24

Some Genesis Centers have a great deal of experience with health promotion, while others do not. For the activities listed below, please mark the answer that applies to your center. For this question, please consider ONLY employee health promotion programs sponsored or subsidized by your center.

1 Yes, FORMAL program now exists	2 Planning to start in next 6 months	3 No plans as yet	4 Willing to consider sometime in the furture
Wellness program			
1	2	3	4
Smoking cessation programs			
1	2	3	4
Weight control or dietary counseling programs			
1	2	3	4
Fitness programs			
1	2	3	4
Stress reduction programs			
1	2	3	4

Healthy meals

| 1 | 2 | 3 | 4 |

Vending machines with at least 50% healthy food

| 1 | 2 | 3 | 4 |

Programs or benefits to help balance work and family

| 1 | 2 | 3 | 4 |

25

Are there any informal employee-initiated wellness programs at your center? Please mark all that apply.

☐ Smoking cessation

☐ Weight control programs

☐ Fitness programs, such as walking group

☐ Stress reduction programs, such as meditation or yoga

☐ Healthy meals/potlucks

☐ Other, please specify

THE ORGANIZATION AS A WHOLE

Instructions: These questions relate to the type of organization that your nursing center is most like. Each of these items contains four descriptions of healthcare organizations. For each question please mark the answer that describes how similar the description is to your nursing home. Your center may be a bit like each of the organizations. None of these descriptions is any better than the others; they are just different.

ORGANIZATION CHARACTER

26

Organization A is a very personal place. It is a lot like an extended family. People seem to share a lot of themselves.

This is nothing like my facility				This is exactly like my facility
1	2	3	4	5

27

Organization B is a very dynamic and entrepreneurial place. People are willing to stick their necks out and take risks.

This is nothing like my facility				This is exactly like my facility
1	2	3	4	5

28

Organization C is a very formalized and structured place. Aside from clinical practices, policies and protocols govern all that people do.

This is nothing like my facility				This is exactly like my facility
1	2	3	4	5

29

Organization D is very business oriented. A major concern is with getting the job done. People aren't very personally involved.

This nothing like my facility				This is exactly like my facility
1	2	3	4	5

ORGANIZATION'S MANAGERS

30

The administration and management staff in Organization A are warm and caring. They seek to develop employees' full potential and act as their mentors or guides.

This is nothing like my facility				This is exactly like my facility
1	2	3	4	5

31

The administration and management staff in Organization B are creative. They encourage employees to try new things and be innovative.

This is nothing like my facility				This is exactly like my facility
1	2	3	4	5

32

The administration and management staff in Organization C are rule-enforcers. They expect employees to follow established rules, policies, and procedures.

This is nothing like my facility				This is exactly like my facility
1	2	3	4	5

33

The administration and management staff in Organization D are coordinators and coaches. They help employees meet the organization's goals and objectives.

This is nothing like my facility				This is exactly like my facility

Decision-making

The following questions describe different forms of decision-making in four different organizations. For each organization please mark the answer that describes how closely your organization resembles it. None of these descriptions is any better than the others; they are just different.

34

Organization A emphasizes teamwork. Nurses, aides, and management share in decision-making regarding issues like work organization, health and safety, scheduling, and health care improvement.

This is nothing like my facility				This is exactly like my facility
1	2	3	4	5

35

Organization B asks for worker input on some issues, but how work is organized, scheduling, health and safety, and health care improvement are largely driven by facility management.

This is nothing like my facility				This is exactly like my facility
1	2	3	4	5

36

Organization C is a partnership between the Nursing Director and the Administrator. Each has separate areas of responsibility. They make all the decisions for their departments, but they work closely together.

This is nothing like my facility				This is exactly like my facility
1	2	3	4	5

37

Organization D functions in a top-down form of organization, with all major decisions made by the administrator.

This is nothing like my facility				This is exactly like my facility
1	2	3	4	5

SUBMIT

Survey Page 2

NIOSH Project Nursing Center Administrator Survey

38

For the following statements, please indicate your opinion.

1	2	3	4	5
Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree

Employee development and well-being are just as important to our organization as patient care and well-being

1	2	3	4	5

Healthy and satisfied employees are generally more productive and efficient

1	2	3	4	5

Employees and management need to work together to ensure the safest and most healthful working conditions

1	2	3	4	5

39

Is there a union at your facility?

YES **NO**

If you answered YES, please answer the next 2 questions, otherwise go to question 43.

40

Please rate the working relationship between the union and management

Excellent	Good	Neither Good nor Bad	Poor	Extremely Poor
1	2	3	4	5

41

Would you expect the union to be willing to work with management in developing a new employee health promotion program?

- Yes
- No
- Don't know

42

Would you/management be willing to support a team of RNs, LPNs and CNAs to develop and lead an employee health promotion program?

YES **NO**

43

How difficult would it be to arrange for a small team of RNs, LPNs and CNAs to meet together weekly or bi-weekly for 30-45 minutes in order to plan health promotion efforts?

- Not difficult
- Somewhat difficult

■ Very difficult

■ Not possible

Thank you for your participation.

SUBMIT →

Survey Page 3

ProCare Report to Genesis Log

1   Interim Report of Findings about the Health of Healthcare Workers in Selected Genesis HCC Nursing Homes (April 2007)

2   Self-reported Health among Clinical Staff in Genesis Centers: Second interim report of findings from 3 surveys (June 2008)

3   Mid-study Report of Findings: 12-month follow-up poster (August 2008)

4   Interim Report of Findings about the Health of Caregivers in Selected Genesis HCC Nursing Homes (August 2008)

5   Summary of Wellness Survey Findings, 2008 (July 2009)

6   Summary of Wellness Survey Findings, 2009 (July 2009)

7   Sample ProCare Report Memo on effects of SRH program on physical workload; relationships between working conditions & smoking, exercise, and overweight (Sept 2009)

8   Ergonomics handout: Effects of SRH program on physical workload (Sept 2009)

9   Handout: relationships between working conditions & smoking, exercise, and overweight (Sept 2009)

10   Relationships among working conditions; Employee mental health and intention to leave the job (September 2010)

11   Qualitative No-Lift Program Follow-up Report (Palm Manor) (October 2011)

PRO-CARE

Promoting Physical and Mental Health of Caregivers

UMASS LOWELL

UCONN

INTERIM REPORT OF FINDINGS ABOUT THE HEALTH OF HEALTH CARE WORKERS IN SELECTED GENESIS HCC NURSING HOMES

Background: Genesis Health Care Corporation is partnering with the University of Massachusetts at Lowell on the "Pro-Care" study to understand better the factors that influence the health of health care workers. This interim report outlines key findings from questionnaires collected from about 650 clinical nursing staff in 8 Genesis nursing homes between May and November 2006.

PARTICIPANT DEMOGRAPHICS

GENDER	ETHNICITY	AGE	YEARS WORKED AT GENESIS	HOURS WORKED IN 2 WEEKS
92% Female 8% Male	66% Black 25% White 3% Latin 2% Asian 4% Other	Average age: 40 years • 24% were under 30 • 28% were over 50 Age range: 17-81 years old	Average time: 11 years • 25% worked 3 years or less • 25% worked over 17 years • 10% worked over 27 years	Average: 69 hours • 50% worked more than 75 hours • 1 in 5 reported having another paid job

OVERALL HEALTH

- **The majority of respondents** (55%) perceived their overall health to be <u>very good or excellent</u>, and 37% said it was <u>good</u>. Only **8%** reported their health to be <u>poor or fair</u>. These results are more favorable than the total United States adult population, in which 85% rated their overall health as good to excellent, and 16% said poor or fair.

- At least one chronic health condition (see chart at right) was reported by **39%** of respondents*. <u>High blood pressure</u> was the most common condition, reported by **1 in 4** participants.

Chronic health conditions reported by Genesis nursing staff*

1	2	3	4
Diabetes	High blood pressure	High cholesterol	Low back pain

- Respondents who rated their health as excellent also tended to say they receive good support from their supervisor, have good balance between work and family life, have low levels of mental strain in their job, and have not experienced physical assaults in the work place. Those rating their health as poor were much more likely to rate these same work place factors negatively.
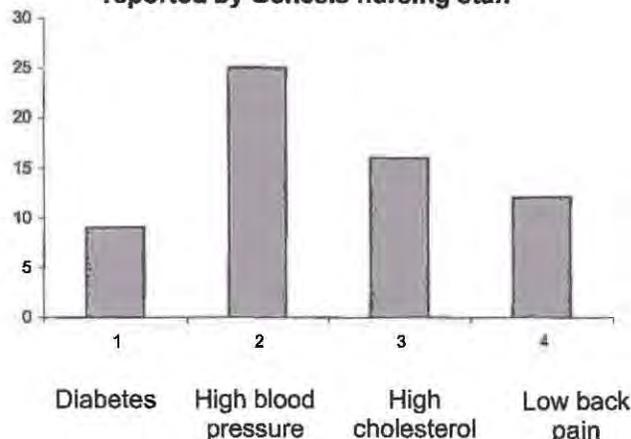
* Each of the chronic conditions was much more common in people with BMI greater than 25.

EXERCISE

Regular physical activity (exercise) helps prevent several chronic health problems, including overweight, heart disease, high blood pressure, and diabetes.

Medical experts recommend that adults should <u>exercise to work up a sweat for 20 minutes or more, at least 3 times per week</u>. This could be fast walking, jogging, heavy yard work, etc.

Alternatively, 30 minutes or more of moderate activity (brisk walking, dancing) done at least 5 times a week, will also provide health benefits.

More than
3 times
per week
12%

1-3 times
per week
33%

None or
only
sometimes
55%

- **More than half** of Genesis nursing staff reported exercising <u>none or only sometimes</u>. This finding is similar to national statistics which shows 54% of adults do not meet the recommended amount of exercise
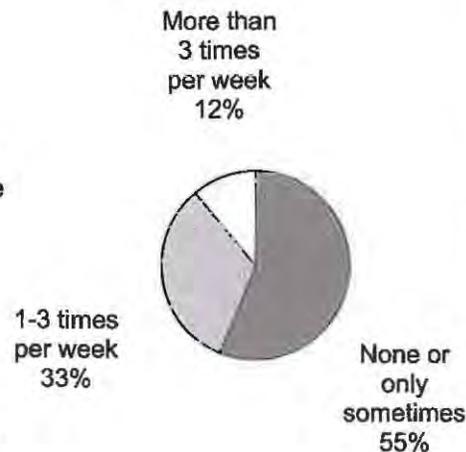
The good news…
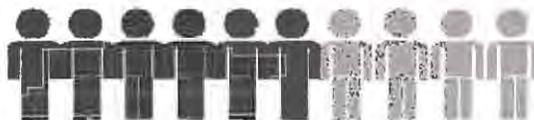
6 in 10 non-exercisers plan to start exercising

- **59%** of non-exercisers are <u>planning to start exercising more</u>, but only **39%** are <u>confident</u> that they could actually do it for at least 6 months.

- **A great majority (84%)** believe that they would <u>feel better</u> if they exercised more, and that their <u>physical health would also improve.</u>

- **This group is motivated, but may need some support.** Of note: non-exercisers said more often than exercisers that they did not feel they had control over their work schedules. They also tended to feel more of a problem with work/family balance. These points suggest that more manageable work schedules might make it easier for people to get the exercise they need.

These findings about exercise is important, because most people reported being overweight as an important health issue. In fact, losing weight was the single most desired change in personal health that participants reported.

> HELPING NURSING STAFF TO ESTABLISH AN ACTIVE LIFESTYLE WOULD GO A LONG WAY TO MEETING MANY OF THEIR HEALTH GOALS.

SMOKING

Smoking is a well-established risk factor for both cancer and heart disease, the two top killers of Americans. Smokers who reduce their smoking can reduce their lung cancer risk considerably in a long run (at least 25% in 5-10 years' time). The risk declines faster in persons who quit smoking underlinecompletely. The risk for heart disease also declines steadily after quitting, and 15 years after quitting, it is the same as those who have never smoked.

- **77%** of Genesis nursing staff said they are non-smokers, either because they never smoked (61%) or they quit smoking (16%).

Current smoker 23%

Quit 16%

Never smoked 61%
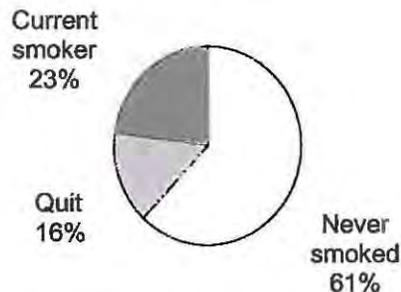
- **23%** reported that they currently smoke. This is very similar to the smoking rate (22%) for adult women in the U.S. population (over 90% of Genesis nursing staff are women).

- **The majority (64%)** of smokers smoked 1-10 cigarettes per day. **Twenty-one percent** smoked more than 15 cigarettes per day. This is much less than among U.S. adult women, in which more than twice as many women (49%) report smoking more than 15 cigarettes per day.

- Smokers were more likely than non-smokers to report higher levels of mental strain in their job. They were also more likely to have experienced physical assaults at work. This suggests that stress reduction would be an important component to address within any smoking cessation programs sponsored by Genesis centers.

The good news...
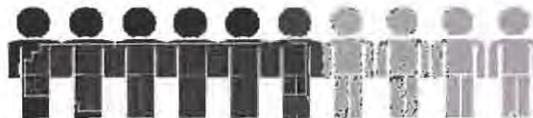
6 in 10 smokers plan to quit

- **50%** of smokers **are** planning to quit within the next 6 months, and **58%** are confident that they could do it.

- **The great majority (85%)** of smokers believe that they would feel better after quitting and **almost all** smokers believe their physical health would improve after quitting.

- **This is a motivated group!**

ACHES AND PAINS

Musculoskeletal symptoms such as low back pain, neck, and shoulder pain are common symptoms of health care workers, especially among nursing staff. This was also true for respondents in this survey:

- **72%** reporting experiencing at least one of these symptoms during the 3 months before the survey. These pain rates are consistent with what other researchers have found in healthcare workers, but are higher than the usual rates in other groups of people.
- **28%** of all workers reported having no pain in any of these body areas.

When asked about how pain in the past month in any body area interfered with their normal work (at home or at work)

- **50%** reported no pain interference, while **43%** said that pain interfered a little bit or moderately with work.
- For **8%** of respondents, pain interfered quite a bit, or extremely with their work.

How many workers reported pain in these body parts 3 or more months before the survey?

Shoulder pain 27%

Wrist or forearm pain 21%

Low back pain 52%

Knee pain 31%
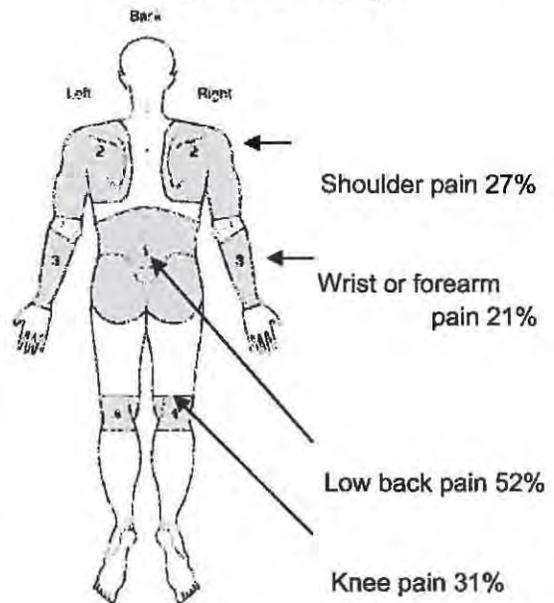
HEALTH AND SAFETY PERCEPTIONS

The health of health care workers is influenced by many factors, both inside and outside the workplace. At the worksite, respondents reported that adequate staffing is a concern to them, and is an important factor affecting their health.

- **65%** of respondents said that they are required to move or lift very heavy loads (objects or people) on the job. Only 29% said they are required to do a task that makes them feel like they might be at risk for getting hurt.

- **40%** of respondents think that their job duties often prevent them from acting as safely as they would like. This may be related to time pressure or to perceptions that work areas are not adequately staffed.

- At the same time, **the vast majority (82%)** of staff believes that management in Genesis nursing homes considers health and safety issues to be important.

The University of Massachusetts Pro-Care research team sincerely thanks all Genesis employees who participated in our health surveys. We will return to your facility two more times before our study is complete. We will also publish our findings in medical journals to help the health care industry understand how to promote good health and protect against injury and disease for the health care work force of the future. Please continue to "Be part of something big" for you and your co-workers.

PRO-CARE

Promoting Physical and Mental Health of Caregivers

UCONN

SELF-REPORTED HEALTH AMONG CLINICAL STAFF IN GENESIS CENTERS

Second interim report of findings from 3 surveys (June, 2008)

Genesis Health Care Corporation is partnering with the University of Massachusetts Lowell on the "Pro-Care" study to evaluate the conditions that affect the health of clinical employees. This report outlines key findings from 2,050 self-administered questionnaires collected from nursing staff in 8 Genesis nursing care centers in Maryland. Data were collected on three occasions (baseline, 3-month and 12-month follow-up) in each center from May 2006 through August 2007.

Use of Resident Handling Devices

At 3 months and 12 months after implementing the no-lift program, about two-thirds of respondents said that they used lifting devices "often" or "always" when moving residents.

The main reasons for not using the lifts were related to accessibility, resident disapproval, and perceptions that they were not needed. The latter two reasons imply a role for **education** to strengthen motivation and compliance with safe resident handling policies.

Ergonomic job analyses confirm that the no-lift program was effective at:

- reducing the proportion of work time spent in resident handling, from 14% to 9% of total work time in gerontological nursing aides (GNA's); and

- improving trunk postures. For example, severe flexion, twisting and bending decreased from 41% to 24% of GNA work time.

Survey Responses: 3- and 12-month follow-up

How often do you use a resident lifting device?

Legend: 3-mo, 12-mo

X-axis: Never, Rarely, Sometimes, Often, Always
Y-axis: Prevalence (%)

If you don't use a lifting device every time, why not?

Device unavailable when needed	25%
Residents dislike them	17%
I feel I don't need them	13%
Not enough time	7%
Too much extra effort	4%
My co-workers don't use them	2%

Predictors of lift use

Respondents who reported low back pain in the first survey (baseline) were actually more likely to be using the lift devices 'often' or 'always' 1 year later. Also, employees who felt less certain of their ability to do their job in 2 years were a little more likely to use the lifting devices. This suggests that people might wait until they are already feeling some health problems before they pay attention to protecting themselves. It is understandable but unfortunate – and it is an issue that needs attention, particularly in a work setting where job demands are high and back injuries are so common.
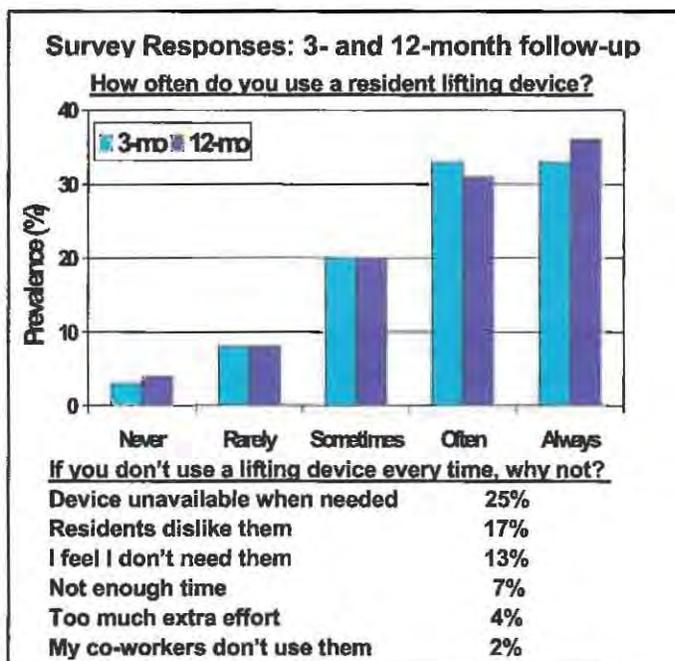
Perceptions of working conditions

Perceived safety showed substantial improvement in these 8 Genesis centers 12 months after baseline surveys (scores increased 20%). This may have been due to the increased emphasis on injury prevention, training, and skills testing that were part of the safe resident handling program.

Physical workload ratings decreased about 10% in the 3 months after baseline, and decreased an additional 5% at 12 months post intervention. However, there was **no change in scores for other psychosocial indicators**, such as decision latitude, psychological demands, social support, or work and family balance.

Working conditions scores reported on 3 surveys
(All jobs titles, limited to respondents in at least 2 surveys)
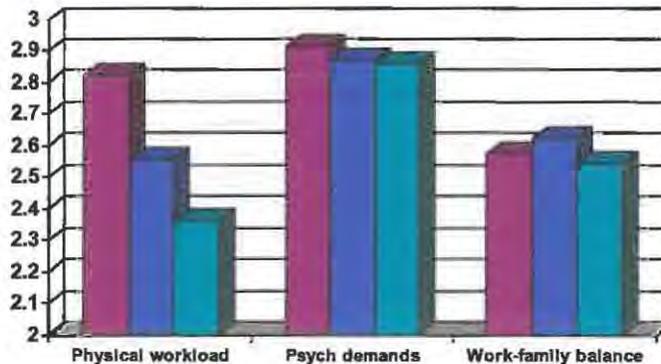
Good relationships with co-workers and supervisors was positively associated with intention to stay on the job and with being confident about being able to continue working for two more years. Good social support also seemed to predict modest improvements in health behaviors such as reduced alcohol consumption, exercise, and weight loss.

Musculoskeletal symptoms

Twelve months after implementing the no-lift program, symptoms of musculoskeletal disorders (MSDs) remain extremely prevalent among respondents. Almost 75% of respondents who had low back pain at the time of the baseline survey still had it one year later.

Respondents who had any musculoskeletal pain - in the back, shoulders, arm/wrist, neck, feet, or knees - were less certain their health would permit them to keep doing their job 2 years from now. They were also more likely to consider leaving the job in 2 years' time.

Improvements seen at 12 months post intervention

Low back pain dropped slightly from 52% in <u>all workers</u> at baseline, to 48% and 49% at 3 months and 12 months post intervention, respectively. In analyses restricted to respondents in both surveys, there was a similar reduction in both low back and shoulder pain, but not in wrist/hand or knee symptoms.

Fewer respondents reported limitations in their ability to work because of back or knee pain at 12 months compared to baseline.

The size of the decreases seen in musculoskeletal symptoms after the lift program was implemented varied by age. Larger decreases were seen in younger workers for each body region except the knees.

2
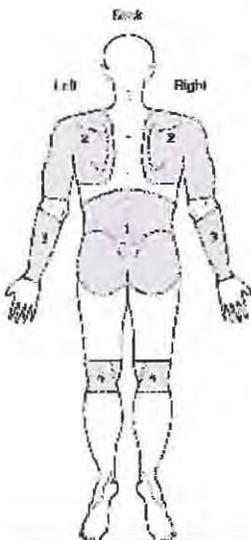
Perceptions of factors influencing personal health

The questionnaires invited several types of write-in responses about how work influences participants' personal health. These questions were open-ended, allowing participants to describe with their own words specific aspects of their work environment that impact their health positively or negatively.

Question: If you think there is something about your job or workplace that has had a bad effect on your health, what is partially to blame? (39% of participants responded) What is the bad effect on your health?

Work factors affecting health negatively

- Other 26%
- Not enough staff 32%
- Exposure to disease 7%
- Heavy lifting 12%
- Environment 11%
- Stress 12%

The most pressing work environment factors (exposures) perceived to negatively influence health was feeling that there is not enough staff to do the job. Heavy lifting, stress, and physical environment (lack of cleanliness, neatness) were the next most common factors cited.

The most commonly listed "bad effects" resulting from these factors were body pain (19%), stress (19%), getting sick (13%), and exhaustion (8%).

Question: If you think there is something about your job or workplace that has a good effect on your health, what deserves credit? (57% of participants responded) What is the good effect on your health?

Work factors affecting health positively

- Supervisor support 5%
- Other 15%
- Job meaning 5%
- Cow orker support 29%
- Focus on health 6%
- Residents 17%
- Environment 6%
- No lift program 7%
- Form of exercise 10%
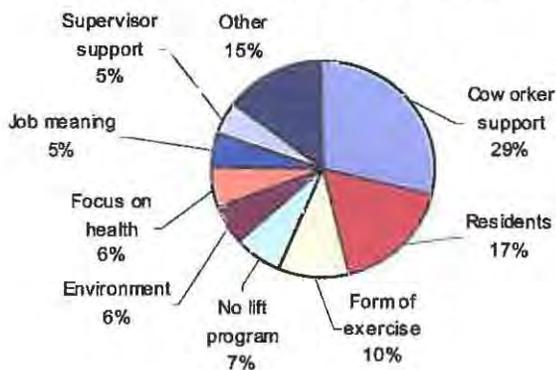
Conversely, co-worker support and teamwork clearly stood out as a positive, health-promoting factor on the job. Working with the residents, physically active work, and the no-lift program were also cited as beneficial to health.

The most commonly listed "good effects" were being healthy overall (28%), satisfaction with life (21%), reducing stress (9%), and no heavy lifting (6%).

The higher response rate for "good effects" vs. "bad effects" (57% vs. 39%) suggests a predominance of worker satisfaction with their jobs.

Question: Thinking ahead two or three years, what would you consider to be an important improvement in your health compared to now? (63% of participants responded)

Most common desired health improvements			
More exercise	20%	Less illness	8%
More sleep	16%	Better diet	8%
More energy	15%	Stop smoking	4%
Lose weight	12%		

The high response rate to this question suggests "readiness" for employee health promotion programs to improve specific lifestyle behaviors.

Exercise—At baseline 55% of nursing staff reporting exercising "none" or "only sometimes." At 12 months, non-exercisers who said they were ready to become physically active were more successful at exercising at least once a week than those in the pre-contemplating or contemplating stages (60-70% vs. 30-40% respectively).   The latter success rate suggests high motivation for this lifestyle change.

Smoking—At baseline, 23% of nursing staff said they were current smokers. A small proportion (10%) of smokers in the pre-contemplator/contemplator group said they had stopped 12 months later. This is consistent with smoking ranking very low among the desired health improvements in the table above.

3

Conclusions and Recommendations

The data in this report show that roughly a third of nursing staff say they do not consistently use the lift equipment when it is needed. Logistics (not being available and not having time) comprise 32% of the reasons given for not using the lift, followed by residents not liking them (17%) and not feeling that the lifts are needed (13%). In addition, nurses are more likely to say they consistently use the lifts if they already have back or other pain than if they do not yet have pain. These data taken together suggest three potential approaches for improving the safe resident handling program:

Program improvement #1—Increase the accessibility of lift equipment for nursing aides.

Recommended strategies:

Conduct an audit on each unit to **assess** the following:
- equipment inventory meets the current resident assessments (sticker designations),
- equipment is stored in locations that are readily accessible, and
- processes are in place to assure that the batteries are charged daily, in compliance with Prevent, Inc. policies and procedures.

Involve nursing aides in leading the audit process and problem solving to improve compliance.

Program improvement #2—Increase resident acceptance of the lift equipment.

Recommended strategies:

Initiate a resident/family education campaign to increase awareness of the benefits of the lifts for protecting the health of caregivers, and helping to assure the continuity of care-giving personnel in the center. Possible touch points for education include admissions, family meetings, posters, letter to family members, and giving nursing aides ideas for key messages to use with residents on a day-to-day basis when using the lifts. Decorating the lifts (residents or their families can help with this) to make them look more "friendly" has been done successfully in other health care settings. A multi-dimensional education campaign can help to foster teamwork and communication between families and care-giving staff.

Program improvement #3—Increase motivation of care-giving personnel to use the lift equipment.

Recommended strategies:

1. Educate clinical staff on the need to comply with lift program policies to protect themselves and their future work ability. Provide ergonomics education, including information on prevalence and causes of musculoskeletal injury, and why the lifts are effective for preventing injury.

2. Implement a worker-driven safety support program to reinforce lift use. This program should incorporate team work and social support between workers to encourage consistent use of the lift program according to the program policies. Assigning a nursing aide on each unit to be the "safe resident handling champion" is an example of this. This person's role is to encourage her/his co-workers to use the lift equipment, identify problems with equipment or stickers, and assure that new care-givers are trained on the equipment in a timely way.

Thank you!

PRO-CARE
## Promoting Physical and Mental Health of Caregivers

UMASS LOWELL

UCONN

Mid-study Report of Findings — 12-month follow up

Background: Genesis Health Care Corporation is partnering with the University of Massachusetts Lowell on the "Pro-Care" study to understand better the factors that influence the health of health care workers. Below are key findings from 2,050 Genesis nursing staff about their health and their work. Questionnaires were collected from 8 nursing centers between May 2006 and August 2007.

MUSCULOSKELETAL HEALTH

Musculoskeletal disorders are extremely common among healthcare employees.

Fewer employees reported pain at 12 month follow-up, and **fewer reported functional limitations** at work due to pain. Even so, 75% of those with low back pain at baseline still had pain one year later.

Shoulder pain
29% in 2006
25% in 2007

Low back pain
54% in 2006
49% in 2007
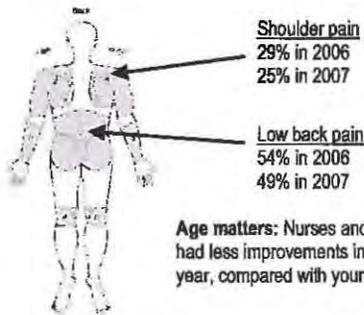
Age matters: Nurses and aides over age 50 had less improvements in symptoms after one year, compared with younger co-workers.

PERCEPTIONS OF HEALTH

Are there factors at work that affect your health?

Work factors affecting health negatively
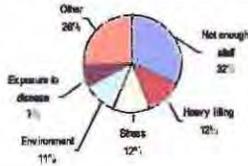
Work factors affecting health positively

If so, how do these factors affect your health?

The most common <u>negative health effects</u> reported were pain (19%), stress (19%), and getting sick (13%).

The most common <u>positive health effects</u> reported were being healthy (28%) and general satisfaction (21%).

What improvements in your health would you like to see?

More exercise	20%	Less illness	8%
More sleep	16%	Better diet	8%
More energy	15%	Stop smoking	4%
Lose weight	12%		

USE OF LIFT EQUIPMENT

About two-thirds of Genesis nursing staff reported that they use lifting devices "often" or "always" when moving residents.

How often do you use a resident lifting device?
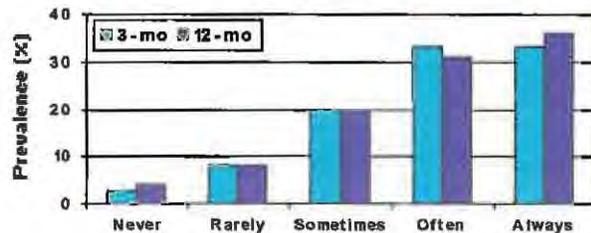
If you don't use a lifting device every time, why not?

Device unavailable when needed	25%
Residents dislike them	17%
I feel I don't need them	13%
Not enough time	7%
Too much extra effort	4%
My co-workers don't use them	2%

Nurses and aides with back pain are <u>more likely</u> to use lift equipment consistently. Those with no back pain may be missing out on the preventive benefits.

Consistent use of lifts may help <u>reduce turnover</u>—fewer nurses and aides who use the lift equipment "often" or "always" intend to leave the job within 2 years.

Making the lift equipment more accessible, plus providing more education for residents and nursing staff, may increase consistent use of the lifting devices.

WORKING CONDITIONS

Compared with baseline surveys, clinical staff reported

- slightly lower ratings of physical exertion,
- improved safety, and
- no changes in overall demands, decision-making opportunities, or social support.

Nurses and aides who reported **good relationships** with co-workers and supervisors also had stronger intentions to stay on the job and thought their health would allow them to continue working there in two years.

Good social support at work also seemed to predict improvements in reduced alcohol consumption, exercise, and weight loss.

PRO-CARE

Promoting Physical and Mental Health of Caregivers

UMASS LOWELL

UCONN

INTERIM REPORT OF FINDINGS ABOUT THE HEALTH OF CARE-GIVERS IN SELECTED GENESIS HCC NURSING HOMES

Background: Genesis Health Care Corporation is partnering with the University of Massachusetts Lowell on the "Pro-Care" study to evaluate the conditions that affect the health of clinical employees. This interim report outlines key findings from questionnaires collected from approximately clinical nursing staff in six New England Genesis nursing homes between January 2007 and May 2008.

PARTICIPANT DEMOGRAPHICS

GENDER	RACE/ ETHNICITY	AGE	YEARS WORKED AT GENESIS	HOURS WORKED IN 2 WEEKS
89% Female 11% Male	Race*: 57% White 27% Black 16% Other/unknown Ethnicity 21% Hispanic	Average: 39 years • 27% under 30 • 20% over 50	Average: 10 years • 25% 2 years or less • 30% 11 years or more	Average: 70 hours • 50% worked more than 75 hours • 1 in 5 have another paid job

*85% of nursing staff in Maine centers identified themselves as white.

OVERALL HEALTH

The majority of respondents (59%) perceived their overall health to be <u>very good or excellent</u>, and 36% said it was <u>good</u>. Only 5% reported their health to be <u>poor or fair</u>.

Chronic health conditions reported by Genesis nursing staff
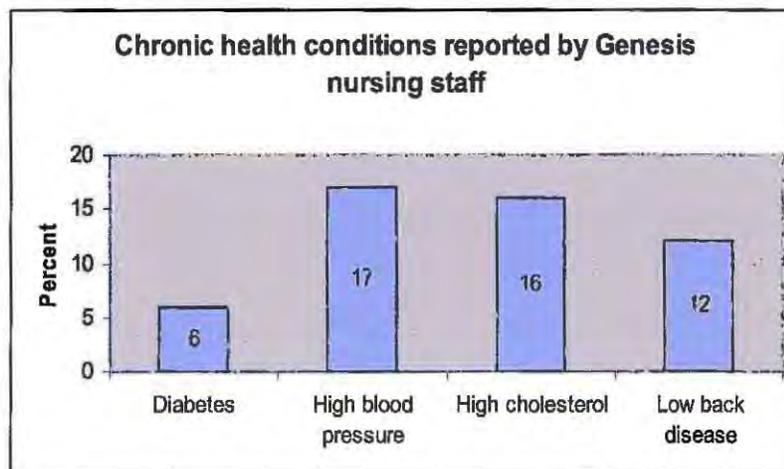
At least one chronic health condition was reported by 33% of respondents. **High blood pressure** and **high cholesterol** were the most common conditions, with each reported by **1 in 6** participants.

Overweight was reported by 65% of staff (BMI greater than 25), which is about equal with the U.S. rate of 66%. Overweight nurses and aides were much more likely to report having one or more chronic condition compared with their healthier weight co-workers.

EXERCISE

Regular physical activity (exercise) helps prevent several chronic health problems, including overweight, heart disease, high blood pressure, and diabetes.

Medical experts recommend that adults should exercise to work up a sweat for 20 minutes or more, <u>at least 3 times per week</u>. This could be fast walking, jogging, heavy yard work, etc.

Alternatively, 30 minutes or more of moderate activity (brisk walking, dancing) done at least 5 times a week, will also provide health benefits.

Times exercise per week
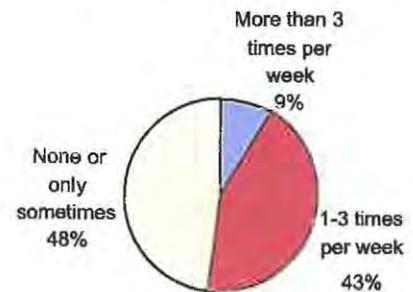
- **Almost half** of Genesis nursing staff reported exercising <u>none or only sometimes</u>. This finding is similar to national statistics which shows 54% of adults do not meet the recommended amount of exercise.

The good news...

6 in 10 non-exercisers plan to start exercising

- **64%** of non-exercisers are <u>planning to start exercising more</u>, but only **41%** are <u>confident </u>that they could actually do it for at least 6 months.

- Compared with centers in other New England states, baseline surveys show that Maine care-givers are 50% more likely to report being very physically active (15% vs. 9%).

This group is motivated, but may need some support. Non-exercisers said more often than exercisers that they did not feel they had control over their work schedules. They also tended to feel more of a problem with work/family balance. These points suggest that more manageable work schedules might make it easier for people to get the exercise they need. However care-givers who hold more than one job may continue to have difficulty with increasing their leisure time physical activity.

These findings about exercise are important, because care-givers reported being overweight as an important health issue. In fact, getting more exercise and losing weight were the top most desired changes in personal health that participants reported.

> **SOCIAL SUPPORT FROM CO-WORKERS AND SUPERVISORS MAY BE HELPFUL FOR INCREASING LEISURE TIME PHYSICAL ACTIVITY, REDUCING STRESS, AND HELPING WITH A VARIETY OF CHRONIC HEALTH CONDITIONS.**

SMOKING

Smoking is a well-established risk factor for cancer and heart disease, the two top killers of Americans. Smokers who reduce their smoking can reduce their lung cancer risk considerably in a long run (at least 25% in 5-10 years' time). The risk declines faster in persons who quit smoking completely. The risk for heart disease also declines steadily after quitting, and 15 years after quitting, it is the same as those who have never smoked.

- **79%** of Genesis nursing staff said they are <u>non-smokers</u>, either because they never smoked (61%) or they quit smoking (18%).

Current smoker 21%

Quit 18%

Never smoked 61%
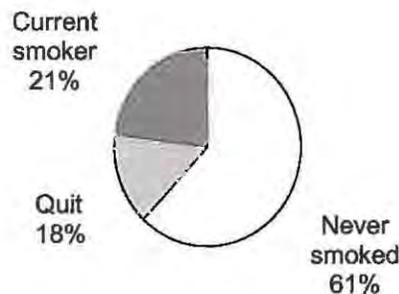
- **21%** reported that they <u>currently smoke</u>. This is very similar to the smoking rate (22%) for adult women in the U.S. population (over 90% of Genesis nursing staff are women). Smoking rates among staff in Maine centers are higher—about 35% of staff said they smoke.

- **A minority (40%)** of smokers smoked <u>1-10 cigarettes per day</u>. **Almost half (47%)** smoked more than 15 cigarettes per day. This is about equal with rates for U.S. adult women (49%), who report smoking more than 15 cigarettes per day.

The good news...
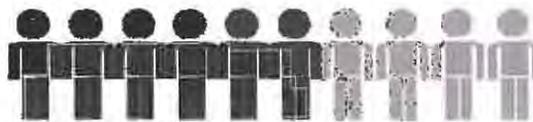
6 in 10 smokers plan to quit

- **61%** of smokers are <u>planning to quit</u> within the next 6 months, but only **18%** are <u>confident</u> that they could do it. This group is motivated, but probably needs substantial support to succeed.

> **PROVIDING ACCESS TO LOW-COST SMOKING CESSATION PROGRAMS THAT COMBINE SOCIAL SUPPORT, COUNSELING, AND NICOTINE REPLACEMENT THERAPY IS MOST EFFECTIVE FOR HELPING EMPLOYEES QUIT SMOKING AND REMAINING SMOKE FREE.**

ACHES AND PAINS

Musculoskeletal symptoms such as low back pain, neck, and shoulder pain are common symptoms of health care workers, especially among nursing staff. This was also true for respondents in this survey:

- **71%** reporting experiencing at least <u>one of these symptoms</u> during the 3 months before the survey. These pain rates are consistent with what other researchers have found in healthcare workers, but are <u>higher</u> than the usual rates in other groups of people.
- **29%** of all workers reported having <u>no pain</u> in any of these body areas.

When asked about how <u>pain</u> in the past month in any body area <u>interfered with their normal work</u> (at home or at work)

- **50%** reported <u>no pain interference</u>, while **43%** said that pain interfered <u>a little bit or moderately</u> with work.
- For **7%** of respondents, pain interfered <u>quite a bit, or extremely with their work</u>.

How many workers reported pain in these body parts 3 or more months before the survey?

←— Shoulder pain 27%

Wrist or forearm pain 21%

Low back pain 52%

Knee pain 31%
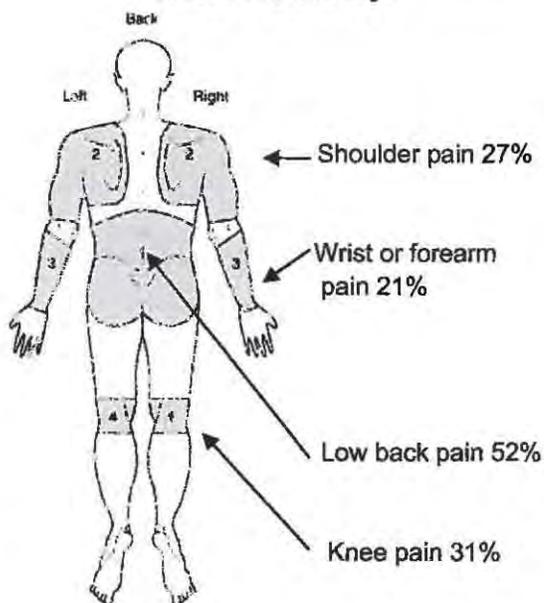
HEALTH AND SAFETY PERCEPTIONS

The health of health care workers is influenced by many factors, both inside and outside the workplace. At the worksite, respondents reported that adequate staffing is a concern to them, and is an important factor affecting their health.

- **47%** of respondents said that they are required to move or lift very heavy loads (objects or people) on the job. 28% said they are required to do a task that makes them feel like they might be at risk for getting hurt.

- **38%** of respondents think that their <u>job duties often prevent them from acting</u> as safely as they would like. This may be related to time pressures or to perceptions that work areas are not adequately staffed.

- At the same time, **the vast majority (87%)** of staff believes that management in Genesis nursing homes considers <u>health and safety issues to be important</u>.

2008 Genesis Health Care Corporation Wellness Survey Results

GHCC centers in the Northeast Region were invited to respond to a written questionnaire detailing wellness activities implemented for employees during 2007. The survey was sent to **48** centers; 21 responded.

Most common activities:

The most commonly reported activity in the "**Healthy Eating**" category was the option of a "**Salad Bar**" 13 centers participated in this with a total of **225** participants., The most common activity performed in the **Exercise** category was the "**Walking Route**", which involved nine centers and a total of **45** participants. In the category of **Weight Loss,** the most popular activity was "**Biggest Loser**", in which there were **216** participants. In the area of **Exercise,** the "**Walking Route**" was the most popular activity with **45** participants. In the area of **Relaxation/Stress Reduction**, the most popular category was "**Traveling Massage**" with **136** participants.

Barriers

The highest reported **barrier** to participation and implementation of these activities was **time,** as time was mentioned in 8 centers as one of the main reason for non attendance of wellness programs. Second to that is lack of interest or apathy with 7 answers. Lack of space was reported by 2 centers. Shift barriers were reported as one of barriers by two centers. Two centers reported lack of ideas. One center reported that they did not know that there was $700 available for wellness activities.

Benefits:

The most common **benefit** to these activities was **increased awareness** and **healthier eating**. Biggest Loser competitions were reported as extremely popular and with a total number of **216** participants across all the centers.

Two centers reported health benefits from continues Blood Pressure Clinics. Three centers reported continuation of exercise by their employees once the exercise started. Four centers reported of weight loss of their staff. Six centers reported increase of morale and awareness and two centers reported increase of teambuilding.

Benefits by percentage

Legend:
- Benefit from blood pressure clinics
- Continuation of exercise
- Weight loss
- Increase of moral & awareness
- Team building
- Reported nothing
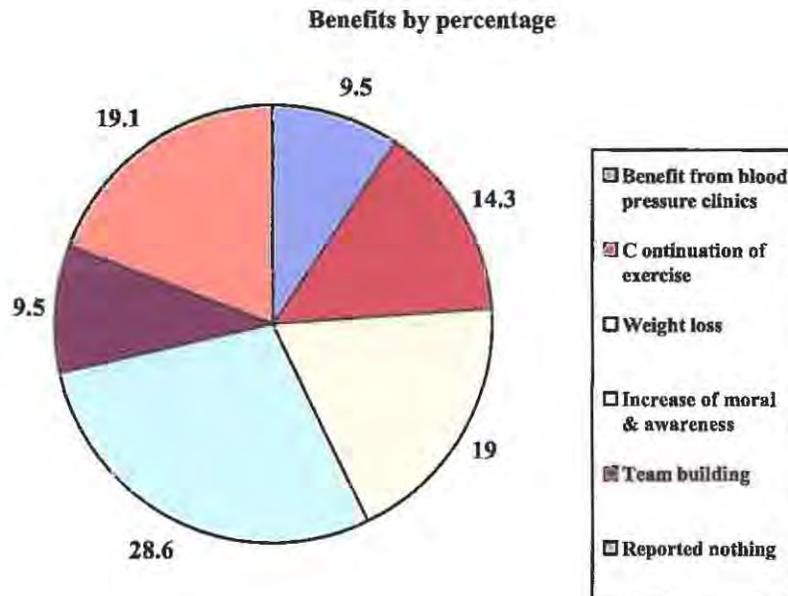
Centers by wellness champions in percentages %

16 out of 21 centers reported that they have WC

23.8

76.2

- ☐ Centers without a Wellness Champion
- ☐ Centers with a Wellness Champion
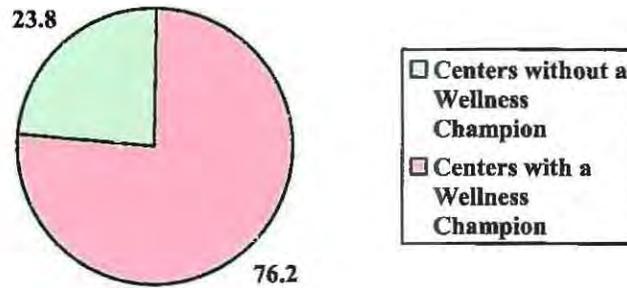
Centers by healthy eating activities in percentages %

Healthy eating activity per center

Activity	%
Salad bar	9.5
Healthy recipe cookbook fund raiser	19
Healthy food tasters	33.3
Healthy pot luck/bag lunch group	9.5
Guess who recipe game	42.9
Recipe swap activity	30.1
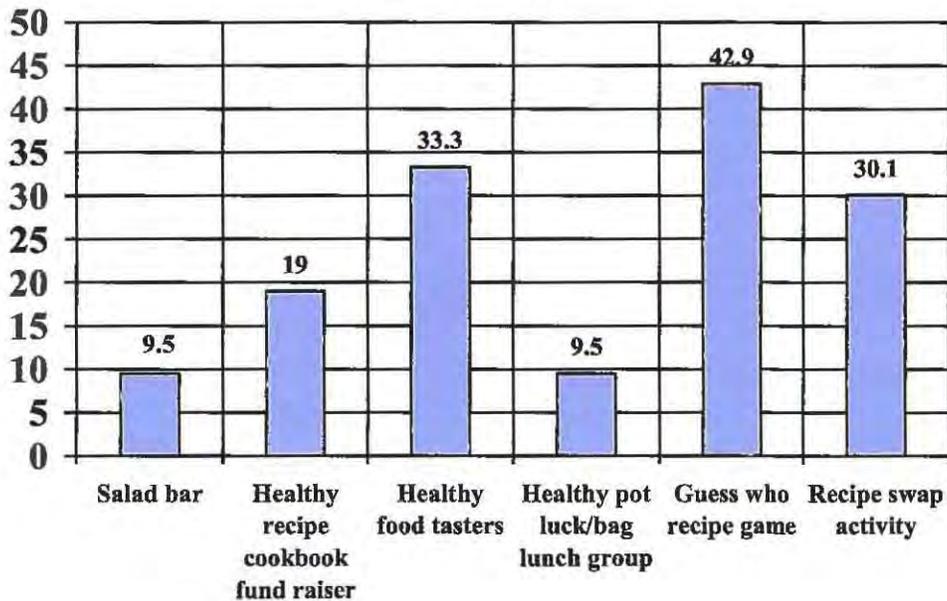
Overall wellness ratings:

An overall wellness score was assigned to each center based on survey responses. This was done to describe the overall level of programming within the Northeast Region. The categories were defined as:

No wellness program (center reported no wellness activities)

Emerging wellness program (center reported 1 or 2 activities--low level of activity overall)

Well-established wellness program (center reporting having a wellness committee plus 3 or more activities)
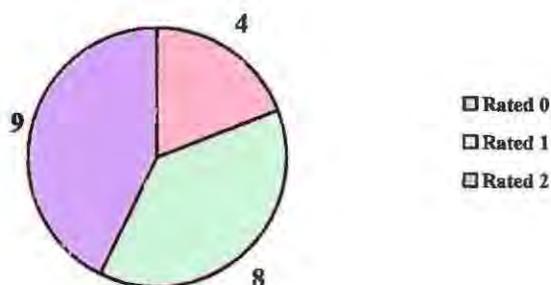
General Comments from the Centers:

Overall, most of the centers reported benefits from these programs increased. However, Keene Center reported that it was unsure of any benefits. Somerset Ridge indicated future interest in many activities (specifically in the areas of **relaxation** and **health promotion**) but did very little in currently implementing any of those activities.

Average Ratings of Activities (between 1-5, with "1" being lowest and "5" being highest):

Healthy Eating: Healthy Vending- 4, Fresh Food in Vending—3, Healthy Recipe Swap-3, "Guess Who" recipe contest-5*, Healthy Pot Luck/Bag Lunch—3, Healthy Food Tasters--2 , Salad Bar--4

Weight Loss: Biggest Loser—5, Weight Watchers- 4*, Discounts on programs –3*

Exercise: Tai Chi—3*, Yoga-- 3*, Aerobics--1*, Center competition--5*, Walking Route—2.5, Walk/Run for Charity—3

Relaxation/Stress Reduction: Massage—4.7, Quiet Room—5*

Health Promotion: Monthly Blood Pressure Clinics—5*, Health Fair with screenings— 4, Wellness bulletin—4*

*indicates that less than 3 centers participated in this activity

Report prepared by University of Massachusetts, Lowell
Center for the Promotion of Health in the New England Workplace (CPH-NEW)

3

Working Well:

Employee wellness activities in Genesis Nursing Care Centers
Summary of findings* from a May 2009 GHCC survey

Genesis Healthcare Corporation Northeast Regional Office, in collaboration with University of Massachusetts Lowell Center for the Promotion of Health in the New England Workplace, administered an online survey with wellness champions in New England Genesis centers between May 12, 2009 and June 12, 2009. Respondents were asked to report on wellness activities and purchasing during 2008. Survey invitations were sent by email to Wellness Champions or Administrators in 46 centers. Two reminder messages were sent before the survey was closed, 4 weeks following the first invitation. A total of 19 surveys were completed, representing 15 centers (38% of possible centers).

Respondents:
- **15** Genesis centers plus Northeast Regional Office (16 total sites)
- **11** respondents (69%) were wellness champions
  - Job titles of wellness champions—staff development coordinator (4), activities director (2), director of nursing/clinical coordinator (3), clinical records coordinator (1), business office manager (1), food service director (1), payroll manager (1), social services director (1), administrator in training (1), support services (1)
  - Most wellness champions have been in their roles for more than a year.

Wellness Program Management

Overall centers seemed to do a good job of basing program activities on interests and needs of employees, whether decisions were made through employee wellness committees or by surveying the employees. However, there appears to be very little awareness (and/or availability) of financial support for wellness programs.

Program management Details
- **Program planning--Committee** was most commonly reported (6 centers) as the wellness decision making body; 3 centers surveyed employees to decide.
  - 6 center committees meet at least once a month (some twice a month)
- **Program Longevity**—3 centers are new to wellness (first year offering programs); 2 centers are veterans (more than 5 years offering programs); the rest are in between.
- **Wellness committees** were reported in **8** facilities (50% of sites)
  - Most committees meet once or twice a month.
- **Wellness budget--prizes** (5 centers) was most common use of funds; 3 centers said they were **not aware of allocated money**
- **Total wellness budget** allocated ranged from Less than $100 (3 centers), $250-$500 (2 centers), to "not sure" (4 centers). Most centers were not able to estimate total wellness expenses for the year.

Wellness activities implemented

Overall level of activity in centers -- Ten of the sixteen facilities that responded reported implementing some type of wellness activity during 2008; six facilities reported implementing no wellness activities. Of the 10 "active" centers, there were some centers that offered multiple wellness program activities and options, and some that offered only a few. This distribution is shown in the chart below.

Distribution of wellness activities implemented in Genesis centers (n=16)
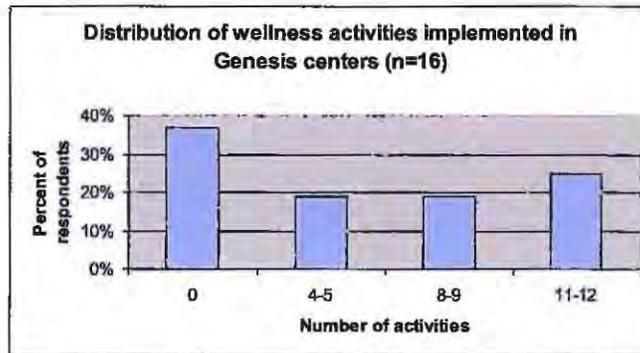
Types of activities implemented -- The most popular activities in each wellness category are listed in Table 1. The vast majority of centers (9 of 10) said that they offered some type of activity to promote healthy eating. Weight loss and physical activity program options were also very common; each was offered by 7 out of 10 active centers. Stress reduction or relaxation activities were offered in 6 of 10 centers. Only 2 centers offered health screenings. The Regional Office was the only facility to offer smoking cessation. Most centers (7 of 10) provided education through wellness bulletin boards; slightly fewer also offered wellness newsletters.

Table 1 Most popular wellness activities by category

Wellness Category	Activities (# centers implementing)
Healthy Eating	Healthy vending machine foods (6), healthy recipe swap (5) and pot luck/brown bag lunch (4)
Weight Loss	Biggest Loser (5)
Physical Activity	Walking routes (5); walk/run for charity (5); walking club (4)
Stress reduction	Traveling massage (4 centers)
Health communications	Wellness bulletin board (6); newsletter (4)

Healthy vending machines, while offered by many centers, seemed to have mixed success; some centers rated this option as average, while only 2-3 rated it above average. An "average" rating may reflect dissatisfaction with the food choices, the vending company, or uncertainty about the nutritional quality of the choices. This activity could be more successful if centers received tips on best practices either from other centers, or from the many guidelines and tips for successful vending policies available from nutrition advocacy organizations. Web addresses for some of these organizations are provided in the Resources section. Healthy recipe swap and potluck lunches tended to be rated favorably if offered periodically, whereas ratings were lower if the center did this activity only once.

The Biggest Loser competition received high ratings from all but 2 centers, and most indicated they would offer this program again. Each center reported between 15 and 40 participants in this particular activity throughout the year. One center expressed that interest waned over time and resulted in drop-outs. Sharing best practice tips may be helpful to centers that want to generate more enthusiasm and motivation for future Biggest Loser competitions.

Walking activities have the benefit of low cost and are feasible to be offered on an on-going basis. Centers who said they were involved in charity walks mentioned several community sponsored events, one of which was the Alzheimer's Walk. This particular event offers an opportunity for staff and families of residents to participate in a cause that is central to the center community. Some centers gave out pedometers to engage employees in logging miles or steps walked as part of a competition or a "virtual journey." The competition or journey culminated in prizes and/or a celebration. See the Resources section below for web links to best practice tips for promoting and sustaining interest in walking programs.

Genesis centers are starting to incorporate some environmental and policy supports in their wellness programs. Several centers reported having a walking path on site, and/or having an exercise room in the facility. However, very little information was provided regarding the extent to which these are utilized. Three centers reported that employees are permitted to exercise during paid work time.

Common barriers to implementing wellness activities
- **Time constraints** was the response listed most often as a barrier to implementing wellness programs and also for employee participation.
- **Lack of employee interest** was also mentioned as well as the challenge of offering programs that can reach all employees, not just a few.

Common benefits described
- Better education for employees on healthy lifestyles,
- Employees are more health consciousness and motivation to take care of themselves,
- Improved morale and teamwork, and
- More social support between employees for healthy behaviors.

Comparison of 2009 survey with 2007 and 2008 Genesis Wellness Surveys

Survey responses decreased each year – 32 surveys were collected in 2007, 21 surveys in 2008, and 16 surveys in 2009. This may indicate declining numbers of centers implementing wellness activities, but we are not able to confirm this without additional data collection in centers that did not respond. For instance, 12 centers that responded to the 2008 survey did not respond in 2009. Several explanations are possible: the center may not have had activities to report, or they were uninterested or unavailable to complete the survey, the wellness champion role was vacant, or they preferred the paper version of the survey over the new online format.

The scope of wellness activities seemed to stay constant, with relatively equal distribution of activities in weight loss, exercise, healthy eating, and print communication.

Stress reduction activities lag behind a little, which is surprising, given the multitude of work-related stressors in nursing homes. It's possible that exercise activities serve stress reduction goals in addition providing physical health benefits. The traveling massage chair continues to be the one offering (aside from a quiet room on center) that addresses stress specifically year after year. Smoking cessation and health screening remain relatively uncommon.

Conclusions

The 2009 wellness survey received the fewer responses than in the previous 2 years. The reason for this is uncertain, but it may be beneficial to administer a second round of surveys using a mailed paper version to the centers that did not respond.

Overall, it appears that centers continue to implement the types of program activities seen in previous years. Activities are relatively evenly spread between categories of healthy eating, weight loss, and exercise; stress reduction trails behind these main categories.

The wellness budget provided to centers by the corporation did not appear to be universally beneficial to program implementation. Several centers said they did not know about this budget and none of the centers reported spending close to the amount allocated ($700).

Centers continue to struggle with participation relative to program planning and gaining employee interest and participation. Genesis Northeast Regional Office can play an important role for sharing best practice tips so centers can be more successful.

Resources

Mass in Motion website
http://www.mass.gov/massinmotion/
This website was launched in 2008 by the Massachusetts Department of Public Health. Click on the tab "for employers" to access a free downloadable Healthy Meeting and Event Guide as well as a comprehensive toolkit for implementing worksite wellness programs:
(http://www.mass.gov/Eeohhs2/docs/dph/mass_in_motion/worksite_toolkit.pdf).
This document is a ready made source of tips, ideas, tools and web links that helps employers implement quality worksite wellness activities. It contains sample surveys, evaluation forms, fact sheets, and best practices tips on walking programs, healthy vending, stress, smoking, exercise and more.

John C. Stalker Institute for Food and Nutrition: The A-List Resource
http://www.johnstalkerinstitute.org/vending%20project/healthysnacks.htm
The A-List is an online list of vending and snack products that meet the Massachusetts A La Carte Food & Beverage Standards to Promote a Healthier School Environment. The list is useful for child and adult consumers alike. It provides names of food products as well as vendors for purchasing.

America on the Move
http://aom2.americaonthemove.org/Home.aspx
Individuals or groups can join AOTM for FREE to promote walking for health. Wellness Champions can register their center as a self-administered group and have access to a worksite coordinator toolkit. Other features of this website are "Virtual Trails" and "Challenge Buddies" which provides motivation and social support.

4

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CPH-NEW
Center for the Promotion of Health
in the New Eng and Workplace

*A research intervention and information center for
improving the health of New England employees*

September 30, 2009

Bret Stine, Administrator
Crescent Cities Center
4409 East-West Highway
Riverdale, MD 20737

Dear Mr. Stine,

As part of our ongoing study to evaluate Safe Resident Handling (SRH) Program at Genesis
Healthcare we are providing you with new findings from survey data analyzed during 2009. Enclosed
please find two handouts: "Effects of No-Lift Program on Physical Workload", and "Relationship
between Working Conditions and Smoking, Exercise, and Overweight." These findings were
generated based on the job observations and questionnaires collected at your facility and eleven others
in Maryland and New England.

Effects of SRH Program on Physical Workload

The charts on this handout clearly show benefits of the SRH program. Nursing aides are spending **less
time** in manual resident handling, **more time** using the lift equipment, and are **able to keep the back
upright (neutral)** while resident handling more often than they did before the Safe Resident Handling
program was implemented. The improvement in postures is important; neutral postures are better for
avoiding excessive force on muscles and joints, which can result in injuries such as strains, sprains, &
spinal disc disorders.

Relationship between Working Conditions and Smoking, Exercise, and Overweight

The charts in this handout show the probability of certain health behaviors or being overweight in
relation to workplace stressors such as time pressures, poor workplace relationships, low decision
control, assault on the job, and strenuous physical demands. The more stressful the working conditions
reported by workers, the higher their personal health risks. This may reflect both direct impacts of the
job interfering with certain health behaviors (e.g., workers in very physically demanding jobs choosing
to rest during leisure time instead of exercising) and indirect impacts (e.g., workers whose job makes
them feel depressed may lose motivation to exercise during leisure time). These results suggest that
any feasible means of reducing work stress would likely have multiple health benefits.

As always, we welcome your questions and feedback on these reports. We will send a more
comprehensive set of results in 2010, when we are able to report on the two-year follow up data in all
18 Genesis centers participating in the study.

Please do not hesitate to contact me (Laura_Punnett@uml.edu) or the Pro-Care Project Manager,
Suzanne Nobrega (Suzanne_Nobrega@uml.edu). We invite you also to visit our research center
website at www.uml.edu/centers/CPH-NEW.

Sincerely,

Laura Punnett

Laura Punnett, Sc.D
Principal Investigator

Effects of a No-Lift Program on Physical Workload of GNAs/CNAs

In several Genesis centers, UMass Lowell researchers observed nursing aides while they worked to learn more about the different types of physical exposures they are faced with at work. We made observations before lifting equipment was brought in to the centers and then 3 months, 12 months, and 24 months afterwards.

Resident Handling Activities* as a Percentage of Total Observations

Percent

- Baseline: 13.8%
- 3-Month: 13.1%
- 12-Month: 9.3%
- 24-Month: 7.1%

Changes in Equipment Use** While Resident Handling

Percentage of Resident Handling Observations

- Baseline: 5.7%
- 3-Month: 5.8%
- 12-Month: 14.6%
- 24-Month: 23.1%
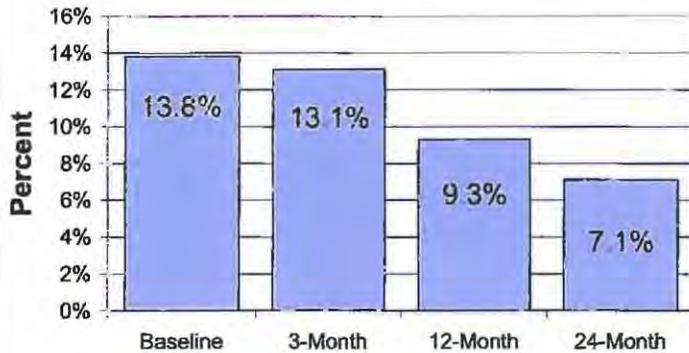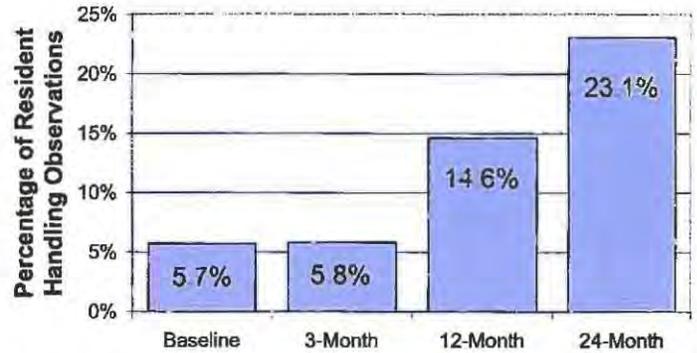
- When resident handling, GNAs & CNAs use lifting equipment much more frequently two years after the No-Lift Program started than they did when the program was new.
- The amount of time spent performing resident handling activities decreased after introduction of lifting equipment, even though using equipment seems slower than manually lifting residents.

Changes in Trunk Posture While Resident Handling* Among GNAs/CNAs

Percentage of Resident Handling Observations

Legend: Baseline, 3-Month, 12-Month, 24-Month

Categories: Neutral, Moderate Flex, Severe Flex, Lateral Bent or Twisted, Lateral Bent or Twisted & Flexed
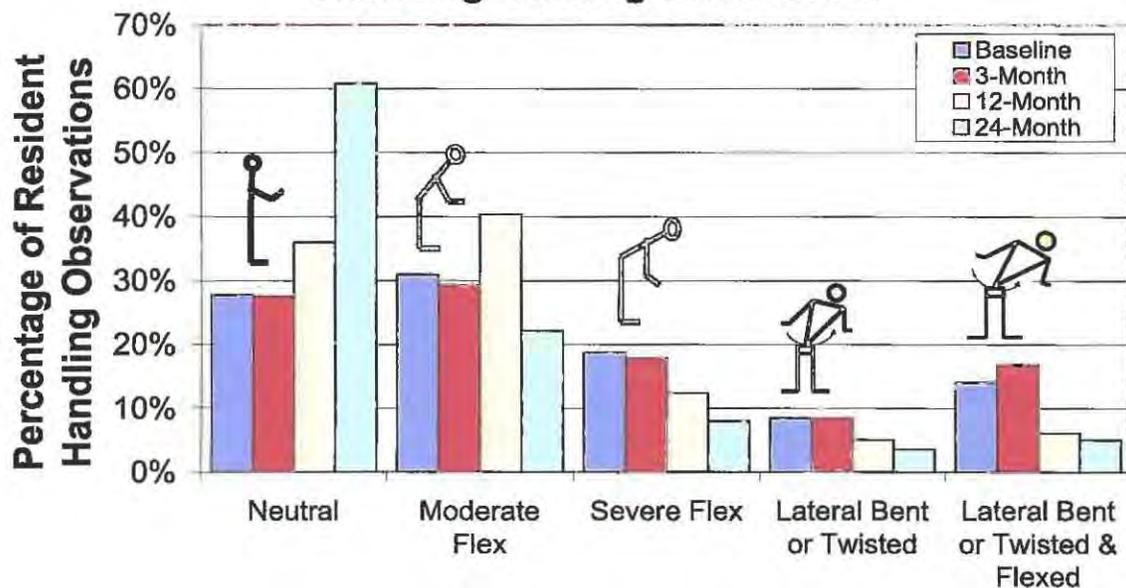
- Body postures have also changed. Two years after lifting equipment was introduced, aides are able to keep the back upright (neutral) while resident handling more often than they did before.
- Neutral postures are better for the body than bending or twisting because of the amount of force on the muscles and joints, which can result in injuries such as strains, sprains, & spinal disc disorders.

* Resident Handling includes ambulation assist, reposition, transfer & transport
** Equipment includes total body lifts, sit/stand lifts, slings, slide boards, slipsheets, and gait belts

The Relationship between Working Conditions and Smoking, Exercise, and Overweight

The first set of questionnaires distributed by U.Mass. Lowell researchers were completed by 920 employees in 12 Genesis centers. Questions on working conditions covered topics like shift work, time pressure, opportunities for making decisions about how to do the job, getting along with coworkers and supervisors, being recently assaulted at work by a resident or resident's visitor, and the physical effort required by the job.

Other questions asked about height and weight, which were used to calculate body mass index, and personal health behaviors such as smoking and exercise. Of all the people who participated in the survey, 35% were obese, 23% got no aerobic physical activity outside of work, and 24% were current smokers. The study results show that these three personal health risks were all related to stressful working conditions ("work organization hazards"), as illustrated below.

1. The probability of obesity increased with the number of these job features that were present for the person answering the questionnaire: few decision-making opportunities; low support from coworkers; lifting heavy loads; regular night shifts; and recent physical assault. People with 4 or 5 of these stressors were almost 3 times more likely to be obese. This trend was much steeper for workers who were younger than 40 years old.

The probability of obesity
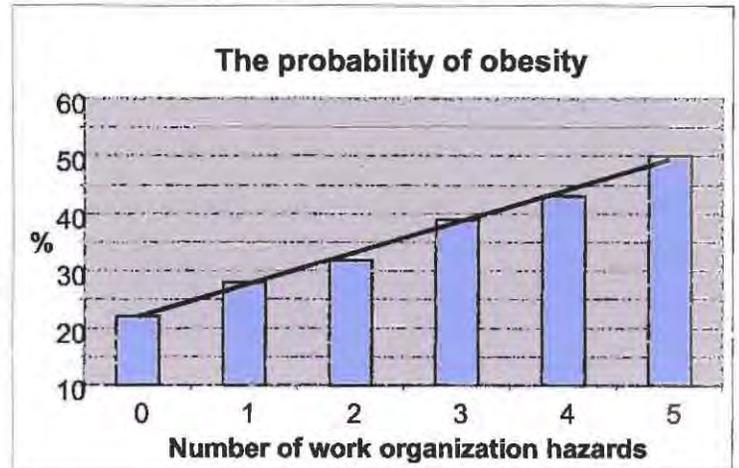
2. Lack of physical exercise was related in a similar way to these organizational aspects of the job: few decision-making opportunities; low support from coworkers; regular night shifts; perceived interference of work demands with family life; and a perception that discrimination in the workplace would be tolerated. People experiencing all five of these were twice as likely to be inactive, with no difference in risk between older and younger workers.

The probability of physical inactivity
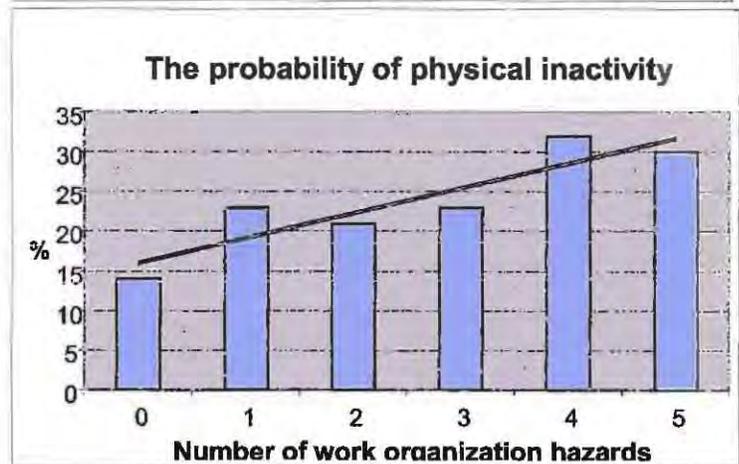
3. Cigarette smoking was also related to a similar set of job stressors: high time pressure and other psychological job demands; low support from the supervisor; lifting heavy loads; generally heavy physical workload; and recent physical assault. Again this trend was much stronger in people who were below 40 years of age; they had about 2.5 times the risk of being current smokers if they had 4 or 5 of these job stressors.
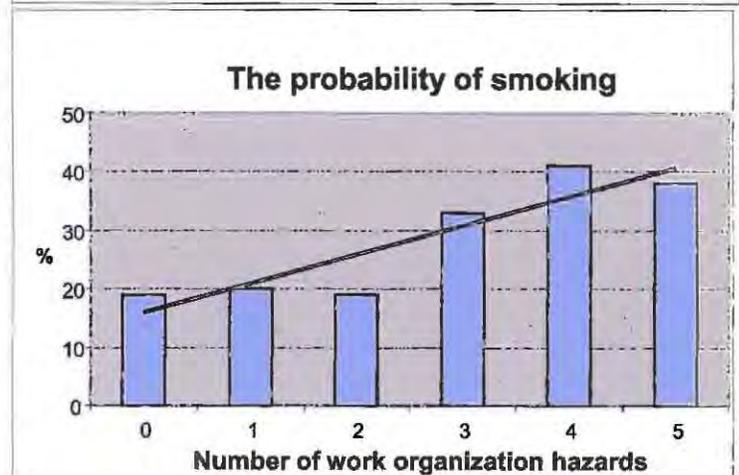
These results show that it is important for health promotion programs to take into account the effect of working conditions on the health and health behaviors of individual employees.

The probability of smoking

PRO-CARE

Promoting Physical and Mental Health of Caregivers

UMASS LOWELL

UCONN

Relationships among Employee Working Conditions, Mental Health, and Intention to Leave the Job

Genesis Health Care Corporation is partnering with the University of Massachusetts Lowell to evaluate the conditions that affect the health of healthcare workers. This interim report from the "Pro-Care" study outlines the key findings from over 1,500 surveys collected from clinical staff members in 14 Genesis nursing care centers and *all* staff members in 4 other Genesis centers. These surveys were collected in Maryland and New England from January, 2007, to November, 2008.

Background

The high turnover rate among employees in long-term care is a serious problem. Turnover is expensive for the employer and disruptive for the employees who remain, especially those who are part of the same team or unit. Finding ways to reduce employees' desire to leave the job would reduce the turnover rate and perhaps also improve the quality of resident care. In the Pro-Care study, we looked at survey results to see whether a person's intention to leave her/his job is related to aspects of the work environment. We speculated that feeling stressed at work might be associated with turnover and with poor mental health.

Employees' Intention to Leave

An employee's intention to leave the job was measured by one survey question: "I am likely to leave this job in the next two years." Nearly 38% of Genesis employees reported intention to leave their jobs in the next two years, and 12% reported a "strong" intention to leave.

I am likely to leave this job in the next two years
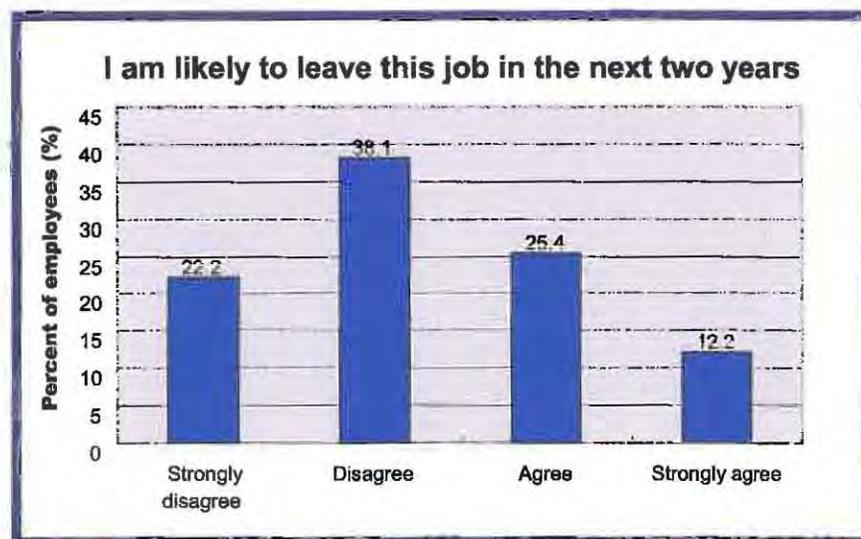
Working Conditions

Our survey also asked Genesis employees to rate four aspects of their working conditions: how well they get along with coworkers and supervisors, whether they feel respected at work, and whether they have opportunities for making decisions about how to do their job. Each question about working conditions could be rated "low" (0) or "high" (1). Ratings for these four working conditions were added to give an index, ranging from 0 to 4. A higher number represents better working conditions. Only 5% of survey participants had a '0' on the working condition index (meaning poor working conditions). Over a third had a '4' on the index, showing that they experienced all four beneficial job conditions.

Working condition index
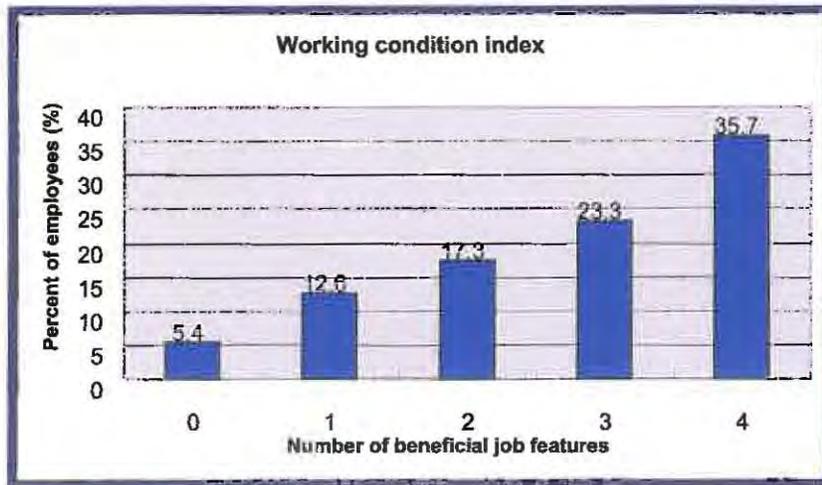
Beneficial job features

Get along with co-workers

Get along with supervisors

Feel respected at work

Can make decisions on the job

The Relationship between Working Conditions and Intention to Leave the Job

A strong intention to leave the job in the next two years was dramatically lower in the people with more beneficial job features. In contrast, people with no beneficial job features were almost 4 times more likely to leave their job in the next two years than people with 3 or 4 beneficial job features.

Strong Intention to Leave
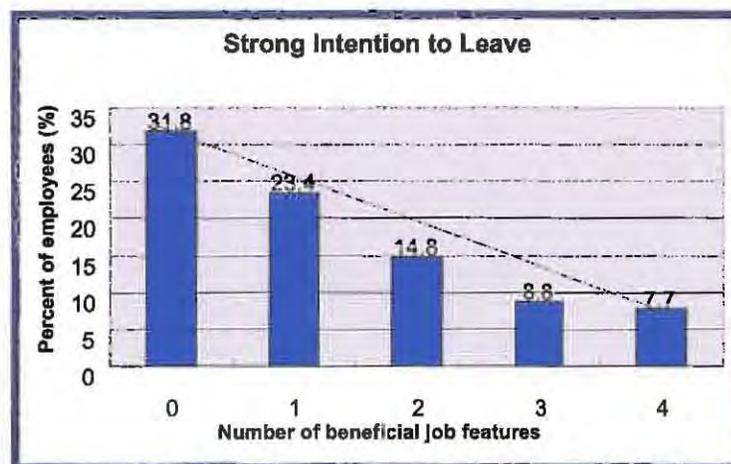
The Relationship between Working Conditions and Employee Mental Health

Mental health was measured by 12 survey questions, which were added together to make a scale (called the SF-12 mental health score). Among all survey participants, the average mental health score was 48.9, which is slightly lower than the average value in the general population.

Just like the intention to stay on the job, mental health increased significantly with the number of beneficial job features. Employees who say they have support from coworkers, support from supervisors, respect at work, and opportunities for making decisions, have much better mental health.

Employee mental health

Bar chart — Average Score (y-axis, 40 to 52) vs Number of beneficial job features (x-axis, 0 to 4):
- 0: 44.47
- 1: 45.84
- 2: 48.1
- 3: 49.04
- 4: 50.74

Conclusions and Recommendations

Better working conditions translate into better mental health and also into a stronger intention to stay on the job. Possible strategies for improving working conditions in the long-term care environment:

- Establish an employee-recognition program
- Genuinely listen to the experiences and opinions of aides when difficulties arise with residents
- Recognize birthdays and personal accomplishments
- Write thank-you notes or give small prizes for working extra time and working on holidays
- Give more opportunities for frontline care workers to get involved in making decisions about resident care, scheduling, etc.

In some Genesis facilities, employee-led teams have been putting these ideas into practice. For example, clinical staff members in one center are currently working on building a shift report form for nursing assistants to use to complete the loop of communication between shifts and promote the continuity of resident care. Employee-led teams promote coworker support and an increased ability to become involved in decision-making.

August 23, 2010

Pro-Care Study: Qualitative No-Lift Program Follow-up Report

Palm Manor Nursing Care Center
September, 2010

Background

Genesis Health Care Corporation is partnering with the University of Massachusetts Lowell on a federally funded research study called "Pro-Care[1]" to evaluate the effect of a new Safe Resident Handling program (also referred to as, "Get a Lift" "Injury Reduction Program" and "No Lift Program") on costs, injuries, and self-reported musculoskeletal symptoms, among other health and work outcomes. Program implementation at Palm Manor Nursing Center began in September, 2005 with the assistance of a contracted firm (Prevent, Inc.) overseeing center-based training and implementation for a period of three years. During this time University of Massachusetts research personnel visited Palm Manor twice (January 2007 and 2008) to perform ergonomic job analyses (to assess physical work load related to resident handling) and to collect survey questionnaires (to measure self reported symptoms and perceptions of work environment factors related to health).

2009 Qualitative Pilot Study

In December of 2009, University of Massachusetts Lowell research personnel re-entered Palm Manor center to pilot test a qualitative instrument designed to 1) explore the reasons why the lift equipment is not always used when it should be; and 2) motivate center managers to engage care-giving staff more actively in problem-solving related to injury prevention. This included identification of resource needs for no-lift program sustainability and other aspects of work organization related to accidents and injuries. Palm Manor center was selected based on proximity to the university and because it was not one of six centers involved in Pro-Care's ongoing comparison study of Genesis' traditional corporate wellness program versus an experimental participatory wellness program.

1 Pro-Care: Promoting Physical and Mental Health of Caregivers through Trans-disciplinary Research

A short, customized report (attached) was provided to a small group of center managers and care-giving staff that summarized the center's questionnaire responses about lift program use, barriers to use, perceptions about lift equipment effectiveness, and musculoskeletal symptoms. The report was reviewed and discussed in individual meetings with the Administrator, Director of Nursing, No-Lift Program champion (who was also the nurse educator) and a Geriatric Nursing Aide Specialist. During these meetings, a semi-structured interview script was used to explore perceptions of the no-lift program and discover possible areas for quality improvement and next steps. Interviews took 20-45 minutes, depending on the course of the conversation and the time available. Topics included survey data on lift program usage, lift program effectiveness, program management (division of labor, challenge areas), management support roles, resources needed for sustainability, and other injuries. See Attachment 1 (No Lift Program Follow up Interview Script) for a full list of questions.

Summary of Interview Results

Perspectives of interview participants were consistent in several areas, including:

- Program effectiveness—lift program has been effective for reducing injuries and risk of injuries. New equipment is superior to previous equipment—both quality and sufficient numbers of devices.
- Program management is efficient, all departments fulfilling their roles.
- Social support--There are strong social norms for using the equipment.
- Challenge areas—Having enough hands available when a lift requires two people; keeping batteries charged.
- The withdrawal of Prevent Inc. nurse trainers is not perceived as having negative impacts. Program components are all being managed appropriately by departments and training of staff is handled by center staff. The exception noted by the nurse educator, is that the ongoing training (once formerly provided by Prevent, Inc.) is now offered only once yearly and during new hire orientation by internal training staff. She recommended that more frequent training on specific aspects of lifting device use would be beneficial to continue for quality reasons. There was no plan yet developed to provide for this ongoing training.

Gaps and issues identified through the interviews—

1. Communication--There is not a formal communication system to discuss the lift program and get feedback from CNAs. Discussion occurs between CNA's GNAS' and nursing management in the context of problem solving, based on equipment failures, incidents/injuries, etc. This represents an area that could benefit from participatory methods of employee engagement. There were a number of possible forums mentioned where the program could be discussed: Bi-weekly meetings with GNAS and management, monthly safety committee meetings, annual competencies training day. Neither was a formal communication system described in which CNAs could raise issues about other topics related to working environment hazards. The health and safety committee was described as "not very active."

2. Program oversight--There does not appear to be global oversight of the lift program, but instead a decentralized, team approach. Although the nurse education coordinator is the contact person for the safe resident handling program, her role primarily extends to the training function, while other departments pick up their respective roles (assessment and stickering, maintenance, laundry, etc.). While it appears that things are going relatively smoothly, it's likely that over time there will be a need for a champion to take the lead on such centralized tasks as managing inventory for equipment and supplies so that caregivers have what they need to adhere to the policies and guidelines.

3. Employee participation— According to Pro-Care surveys of clinical staff at Palm Manor, 27% of CNAs said it takes too long for suggestions to reach management to be acted on. The Administrator expressed interest in the research staff conducting additional inquiry into this issue. However we did not have an opportunity to speak with additional CNAs.

4. Unintended trends in increased demands—the GNAS interviewed noted a trend over time that more and more residents are assessed as needing full body lift (overweight or declining function). This creates time pressure on CNAs— (2 CNA's per lift are needed) as well as more physical load (heavy to push lift on carpet). Therefore, full compliance with the lifts may not mean that the overall demands on the CNAs are reduced.

5. Unintended consequences for residents—as more residents need lifting devices, it becomes difficult to reposition them as often as they need because it takes more time to use the lifts. There is somewhat of a concern from nurses that the lift program goals may not always be harmonious with resident well-being. Concern for resident perspectives was also an issue that is reflected in the survey data. When caregivers were asked why they might not use the lifts all the time, 41% said it was because the residents don't like them.

Conclusion and Recommendations

Overall, the Safe Resident Handling program appears to be operating smoothly as evidenced both by the Pro-Care surveys and the qualitative follow up study. The qualitative follow up study was useful for identifying areas for improvement in communication, maintaining equipment (batteries charged), and for stimulating management interest in continuing quality assurance (including evaluation) for the lift program. These issues and others could be important for helping to prevent future pitfalls that could stand in the way of the lift program being as effective as possible for preventing injuries.

We recommend that Palm Manor center consider the following actions for assuring continued effectiveness of the Safe Resident Handling Program:

1. Continue monitoring injury rates for clinical staff and residents to identify upward trends for which root causes may relate to resident handling.

2. If the Safety Committee for the center is inactive, provide resources and leadership to strengthen the committee's role and functional effectiveness for oversight of both employee and resident safety concerns. Make the Safe Resident Handling program one of the core programs for Safety Committee oversight to assure systems are in place to assure continuous improvement in the areas of injury monitoring, equipment inventory, accessibility, and maintenance, and training.

3. Work with unit managers and other clinical managers to regularly engage care-giving staff in safety discussions about the lift program and other topics related to work environment hazards. This could be done as part of on-going bi-weekly GNAS/management meetings. Regular discussions could help to increase employee engagement, expedite problem solving, and identify concerns that should be brought to the Safety Committee for action and benefit to the center as a whole. It is important that when managers talk with care-giving staff about work environment concerns they follow up to ensure that communication travels in two directions—from front line staff to management, and then from management back to front line staff—so that participation and team work is rewarded and reinforced.

4. Consider scheduling additional training opportunities for staff on specific aspects of lift operation and maintenance procedures. Assessment of training needs for all affected departments will become more important over time, as new employees replace those who were originally trained by Prevent Inc. Training needs should be assessed with some regularity, and can be informed by concerns raised within the Safety Committee (if recommendation #2 is adopted). More frequent training opportunities will serve to reinforce skills and procedures which in turn, can help insure program effectiveness.

Attachment 1

No Lift Program Follow up Interview Script
Palm Manor Center

Interview goal: Understand the perspectives of key center personnel about the lift program effectiveness, quality of program management, roles for management to help program be successful, and future needs for sustainability.

I. BACKGROUND/INTRODUCTION

No-lift program was implemented in Fall 2005 in Palm Manor.

In January 2007 and January 2008, Pro-Care research team collected questionnaires to learn about clinical staff concerns related to health and working conditions.

- Surveys were done part of evaluation of lift program
- Overall study findings will be available in 2010

Although we did not collect baseline data at Palm Manor, we would like to share the findings from your center on musculoskeletal symptoms and lift use and get your input on how the program is working, successes and challenges, and what is needed for future.

(Show the report, discuss key areas of interest, and ask for reaction)

II.PERSONAL HISTORY

How long have you worked at Palm Manor?

Did you work here when the no-lift program was first introduced?

III. LIFT PROGRAM EFFECTIVENESS
1. How do you think the program is working?

Probe: Does it meet the needs of the care-giving staff?
Probe: What do you like about the program? Not like?
Probe: Have you noticed changes in injuries?
Probe: Have you noticed changes in staff attitudes?

2. If there are situations when a lift is not used (when it should be), what do you think are the most common reasons?

IV. PROGRAM MANAGEMENT

The no-lift program has many components—training clinical staff on how to use them, resident assessment/stickers, equipment maintenance and replacement, laundering, etc. The next questions relate to the management of the overall program.

3. Now that Prevent Inc is no longer in the center, how are things going overall?

Probe: What is the division of labor and responsibility?
Probe: What is going well? Why are these things going well?
Probe: Are there certain things that have been more challenging to manage than others? Why is that?

4. What is your role (management's role) for supporting full compliance with program standards?

Probe: How often is the program discussed--in units, in management meetings?
Probe: Is there anything more you feel you could be doing to encourage use of lifts and/or make back injury prevention a priority?

V. RESOURCES and SUSTAINABILITY

5. Given your experience with what it takes to maintain the quality of the No-lift program, what are your thoughts about being able to sustain the program?

Probe: Do you have the resources you need, and if not, what's needed?
Probe: Are there ways you feel the program could be improved?

VI. GENERAL INJURY PREVENTION

6. Are there other injuries for nursing or other departments you are concerned about?

INTERIM REPORT OF FINDINGS:

Lift Use among CNAs and GNAs in Palm Manor Nursing Care Center

Background: Genesis Healthcare Corporation is partnering with the University of Massachusetts Lowell on the "Pro-Care" study to evaluate the impact of a Safe Resident Handling program (also known as "no-lift program" and "injury reduction program") on employee health and net cost savings. Self-administered questionnaires were collected from clinical nursing staff at Palm Manor during January 2008. Key findings concerning lift use and musculoskeletal symptoms for the 41 CNAs and GNAs who participated in the study are presented below.

Musculoskeletal Symptoms

Musculoskeletal symptoms such as low back pain, neck, and shoulder pain are common symptoms of health care workers, especially among nursing staff. This was also true for respondents in this survey:

How many aides reported pain in these body parts 3 or more months before the survey?

Body Part	% Aides MS "cases"	% Aides Pain
Low back	28%	44%
Shoulder	24%	37%
Wrist/forearm	8%	10%
Knee	16%	22%
Neck	NA	15%
Ankle/feet	NA	32%

NA = not available
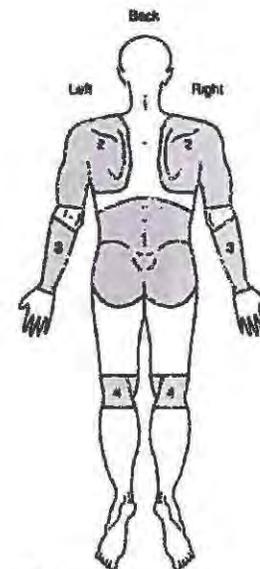
Data from a sample of 6 Genesis nursing homes show 71% of clinical nursing staff (aides, LPNs, RNs) reporting experiencing pain in at least one body part during the 3 months before the survey. These pain rates are consistent with what other researchers have found in healthcare workers, but are higher than the usual rates in other groups of people.

Lift Use

In general, when you move residents, how often do you use a lifting device?

	Never	Rarely	Sometimes	Often	Always
2007	5%		23%	27%	45%
2008		3%	20%	30%	47%

If you don't use the lifting device every time, what is the <u>main</u> reason?

	2007	2008
The devices are not available or not functional when needed	40%	28%
My co-workers do not use them		3%
The devices take too much extra effort	10%	3%
I don't feel that I need them		3%
I don't' have enough time		6%
Some residents don't like it	27%	41%
Other	20%	15%

Perceptions about the Injury Reduction Program

Question	Agree	Disagree
Coworker support		
Co-workers support each other to use patient lifting devices	95%	5%
I alert other employees when they place themselves at risk during a patient lift	74%	26%
Management support		
Employee suggestions about patient lifting are supported by mgt	82%	18%
My supervisor makes every effort to ensure that employees have what they need to be safe at work	95%	5%
Management is responsive to employee concerns about pt lifting	98%	2%
Worker participation/control		
It takes too long for employee suggestions about patient lifting to go through the proper channels	27%	73%
Job duties on my unit often prevent employees from acting as safely as they would like	39%	61%
I find it easy to get access to the patient lifting devices on my unit	92%	8%
When it comes to patient lifting, I am asked for my input on how I use my workspace	79%	21%
If patient lifting devices were used with every patient lift, the risk of getting injured would be very low	85%	15%
I think the Injury Reduction Program will help me and my co-workers avoid injuries in the future	90%	10%

CENTER FOR THE PROMOTION OF HEALTH

IN THE

NEW ENGLAND WORK ENVIRONMENT

PROMOTING CAREGIVERS' PHYSICAL AND MENTAL

HEALTH VIA TRANSDISCIPLINARY INTERVENTIONS

INTERIM QUALITATIVE EVALUATION REPORT

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NORTHAMPTON, MA
JANUARY, 2011

INTERIM QUALITATIVE EVALUATION REPORT

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INTRODUCTION

"Promoting Caregivers' Physical & Mental Health via Transdisciplinary Intervention" is an ongoing research effort currently underway at the University of Massachusetts at Lowell (UML) with multi-year funding from the National Institute for Occupational Safety and Health (NIOSH). To evaluate the results thus far, an interim qualitative assessment of the interventions through which activities and programs linking employee involvement in health promotion with psychosocial, work environment, work organization, and occupational health and safety at three nursing care facilities in New England was conducted. Wellness programs at three control sites, which had mature health promotion programs at the start of the study, were also assessed. All centers in the study are part of the [the corporation's] Healthcare Corporation, and there is no union at any of the study sites.

The goals of the research project are to assess sustainability of health and wellness programs, worker empowerment, and the facility's ability to link wellness programs to work organization, psychosocial stressors, and health and safety concerns. The key questions to be covered in this interim report include: (1) how the actual implementation corresponded to the planned activities, (2) what unanticipated obstacles or opportunities arose in the interventions, (3) where new or revised approaches are needed to overcome obstacles and allow for more sustainability, and (4) a comparison between the intervention and control sites.

Each of the intervention sites has a wellness program carried out by a Health and Wellness Team (HWT), a non-supervisory, employee involvement committee initiated and facilitated by UML researchers under the direction of Marian Flum, ScD. The model used for each of the intervention sites integrated a non-supervisory employee involvement team focusing on health and wellness that went beyond the traditional health promotion activities would take the place of a single Wellness Champion. Each team would have a 'point person' to act as leader of the team. The teams would meet every two weeks to identify issues of concern, prioritize them, plan and implement programs, and evaluate each activity. Research assistants would work closely with the teams to assist with problem-solving. The intervention sites involved in the study have been meeting for just over two years and have closely followed the model. They include the following facilities referred to as I-1, I-2, and I-3 located in Agawam, North Andover, and Westford, Massachusetts respectively.

For purposes of comparison and evaluation, three control sites were selected as part of the research design. These sites were assessed initially, but did not receive facilitation services from UML. Follow-up interviews were conducted during this interim evaluation phase. Control sites include the following facilities referred to as C-1, C-2, and C-3, located in Lowell, Massachusetts; Warwick, Rhode Island; and Westbrook, Maine respectively.

The qualitative interim program evaluation design consisted of participatory research using team self-evaluations, key informant interviews, and materials review over the course of three months during the summer and fall of 2010 to assess sustainability, worker empowerment, and the Team's ability to go beyond traditional health promotion programs. The intent of the design was to conduct a self-evaluation with existing HWTs at the intervention sites, and to interview wellness team members and/or activists at each control site. At each site, the center Administrator and other management personnel were to be interviewed individually.

The HWT self-evaluations were conducted with team members as a group at each intervention site. Team membership included Certified Nursing Assistants (CNAs), Geriatric Nursing Assistant Specialists (GNASs), housekeepers, and clerical staff. Teams also included non-supervisory middle managers including an LPN, a clinical staff educator, and a human resources director.

The key informant interviews were designed to be conducted at both intervention and control sites with the Administrator; key managers including directors, program managers, department heads, nursing educators, unit managers; and wellness team members or activists including clerical staff, benefit coordinators, dietitians, CNAs, food service workers, and laundry workers. These interviews were conducted either as a group or as individual interviews depending on the Facility.

Each team-self evaluation session and key informant interview was designed to be conducted by three researchers, one acting as facilitator and the other two as recorder and note-taker, recording all verbal and non-verbal communication, such as facial expressions, body language, nods, non-verbal emotional responses, or head shaking. All sessions were designed to be digitally recorded, so that a complete record of the session could be obtained. Data was analyzed for general themes at each site and across all study sites. Information was designed to be collected from non-supervisory personnel, center Administrators, and center management. Triangulation, in which data are compared across multiple sources and methods, was to be used as a check on reliability and validity.

Team Self-Evaluation

In keeping with the design and methodology of participatory research, team self-evaluations were conducted with members of the facility's Health and Wellness Team as part of a regular meeting in each of the intervention sites and all were digitally recorded for further analysis.

Discussion questions were designed to cover the major themes of this research project including workers' perceptions of: (1) their greatest health risks (occupational or non-occupational), (2) management's interest in their well being, (3) challenges regarding their work as a team in relation to center management and administration, (4) the impact of outside facilitators from the university, and (5) workplace conditions and whether they meet workers' social, psychosocial, and environmental needs.

Key Informant Interview

Key informant interviews were designed to occur at each of the six sites in the study. At the intervention sites, the Administrators and key managers were to be interviewed. At the control sites, administrators and managers involved with any wellness initiatives and employees interested in promoting wellness were to be interviewed. The discussion questions for Administrators differed from those used for managers and department heads and non-supervisory employee interviews (see Appendix A, B).

Discussions with Administrators delved more deeply into the (1) management expectations and perceptions about the health and wellness, (2) employee health and safety concerns, (3) perceptions of the Team and its sustainability for the future, and (4) interactions between the health and wellness activities and other corporate programs, particularly with regard to recent changes at [the corporation's] regarding medical records, leadership styles, and culture change.

At the intervention sites, the interviews with managers and department heads focused on their (1) awareness of health and wellness activities generated by the team, (2) support that they might be able to offer these programs, (3) their suggestions about increasing employee involvement and participation in health and wellness programs, (4) communications issues, (5) issues related to the psychosocial work environment, (6) work organization, and (7) any other employee health and safety needs of concern to them as departments heads and managers.

At the control sites, information about current or past wellness activities was gleaned from the key informant interviews with Administrators, managers, and other employees involved in wellness activities.

Key informant interviews provided significant and sometimes contradictory data on management expectations and perceptions of employee wellness and health and safety concerns. These trends are covered in the section on *Findings*.

Materials Review

In addition to the team self-evaluations and key informant interviews, materials were collected and/or reviewed at each site including: newsletters, flyers, postings on bulletin boards related to health and wellness, and upcoming educational opportunities or forums for staff.

RESULTS

In accord with the research design, HWT self-evaluations and key informant interviews were held at each of the intervention sites. Although none of the HWTs had 100% attendance at the team self-evaluation, overall, approximately 75% of all team members were present.

The following topics were discussed: (1) how the actual implementation corresponded to the planned activities, (2) what unanticipated obstacles or opportunities arose in the interventions, (3) where new or revised approaches are needed to overcome obstacles and allow for more sustainability, and (4) how each of these compares between

the two groups (intervention and control). In order to ascertain the extent to which communications with and support from management occurred, information was also collected from managers on their willingness to assist the HWT based on their professional responsibilities and availability.

The following table indicates the types of activities engaged in by each facility during the period 5/08 through 10/10.

Table 1. *Activities for Employees Sponsored by Individual Centers and/or Participatory Health and Wellness Teams in Participatory Intervention or Non-Participatory Control Sites*

Activities	I-1	I-2	I-3	C-1	C-2	C-3
1. Approach Coach[1]				X		
2. Break Room	X					
3. Communications	X	X	X			
4. Ergonomics (healthy back) training	X	X	X			
5. Exercise	X	X	X			
6. Farmer's Market	X					
7. Fresh food	X	X	X		X	X
8. Garden			X			
9. Health Fair						X
10. Healthy Snacks	X			X	X	
11. Massage	X	X			X	X
12. Nutrition Education	X	X	X		X	
13. Picnic Table	X	X				
14. Recreation (sponsored trips)	X					
15. Suggestion Box		X		X		
16. Walking		X	X	X	X	X
17. Weight Loss			X	X		X

Facility I-1

HWT self-evaluation and management interviews were conducted at Facility I-1 on 8/4/10. Participants in the self-evaluation included 4 CNAs (one male), a nurse educator, a clerk, and a dietitian. Management interviewees were the center Administrator, rehabilitation program manager, and a unit manager. Facility I-1 is part of a larger campus of buildings; only Facility I-1 is engaged in the study from that campus.

Facility I-1, an intervention site, has 140 beds. There are generally six to eight employees participating in the meetings of the HWT; seven employees participated in the team self-evaluation including four CNAs, a dietitian, a medical records clerk, and a nursing educator. Two of the employees who attended the self-evaluation had been invited by the nursing educator, had expressed interest in the team, but had not previously attended any HWT meetings. Most of the employees at Facility I-1 are Caucasian as were all of the people interviewed. The medical records clerk is the primary contact to the HWT and shares outreach responsibilities with the nursing educator.

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[1] The Approach Coach model is not necessarily a health and wellness activity though it has importance as a work organization tool for workplace conflict resolution and employee stress relief. It is a unique peer mediation program which the facility Administrator designed with assistance from a grant. According to the facility Administrator, the model has had a positive impact on the employees and patients of the facility. Therefore, it is included in this list of activities related to health and wellness.

The Team's major accomplishments over the past three years of the study included redesigning their break room (to create a quiet, relaxing space), communications, ergonomics training, a plan for a farmer's market, fresh food, healthy snacks, massage, nutrition education, picnic table, and sponsored trips. Employees perceived the Campus Administrator as lukewarm and the Facility Administrator as supportive of the Team's initiatives. No one is assigned by management to take on health and wellness activities; it is strictly a volunteer group. The medical records clerk is the liaison to the facilitators. Members of the Team expressed disappointment in the lack of participation by other employees, particularly nursing care staff, who often have difficulty getting off the unit to attend a meeting or program.

The Team is working on issues that go beyond traditional wellness initiatives and delve more deeply into psychosocial stressors by redesigning the break room, work organization by creating a communications log for staff on the clinical units, the work environment by getting healthy food in the vending machines, and occupational health and safety (ergonomics training). It is unclear at this interim evaluation juncture whether this effort is sustainable without the outside assistance of the University-based facilitators.

The Administrator at Facility I-1 expressed his keen interest in involving employees in health and wellness activities. As a new Administrator, he said he has "seen some great value in what the program has to offer" and applauded the new picnic table for the non-smokers, the binder of resources for healthier nutrition, and healthier snacks. In addition, he showed his support for the Team's efforts and his hope that participation would increase as the Team continued to succeed by stating that "if there is an opportunity for people to be a part of the solution, I think that would be well received and I would expect better participation." He indicated the less enthusiastic support from some of the managers when he stated, "The management team truly needs to embrace this program and understand it better as well. I think I might have a better grasp than many of the managers and still I have room to learn a little more about where we might go with this." Since the date of this interview, he has resigned.

Management interviews at Facility I-1 included a group interview with a unit manager and a program manager who admitted they had no idea why they were being interviewed, the purpose of the meeting with the research team, or the scope of the activities of the Health and Wellness Team. For instance, when asked about the best ways to communicate information about team projects or activities, one of the managers said it took her a few days to connect the healthy snacks in the lobby with the Health and Wellness Team and the other said she did not even know about it. In addition, the two managers did not connect such issues as decision-making, problem-solving, or inter-shift communication with health and wellness activities.

In comparison to the control sites, data from Facility I-1 suggests the Team seems to be actively working with strong employee involvement, development of problem-solving skills, and an understanding of the strengths it takes to overcome barriers with strong perceptions of support from the Facility Administrator and less support from managers but it is unclear whether the effort is sustainable.

Facility I-2

HWT self-evaluation was conducted at Facility I-2 on 8/10/10. Participants in the self-evaluation included a medical records clerk, two CNAs, an LPN, and a bookkeeper. Management interviews were conducted on 8/10/10 and 8/17/10 and included individual interviews with the Administrator, Director of Nursing, Director of Food Services, Director of Recreation, and a unit manager.

Facility I-2, an intervention site, has 142 beds. There are currently five employees on the HWT. There were four non-supervisory employees participating in the team self-evaluation. The staff at Facility I-2 is mostly comprised of Caucasians and Latino/as.

The Team's major initiatives during the study period included communications, ergonomics training, exercise, fresh food, nutrition education, picnic tables, suggestion box, and the walking program. In addition, the team worked on a room change policy that would aid in communication for employees on the units. The Team worked on a communications log book but there were different managerial perceptions. One manager thought it was for staff to log in concerns about residents and another thought it was for managers to give information to the team. The team had originally decided that a suggestion box would be helpful to gather employee input. Contrary to team preference, it was installed in front of a security camera so that it would not get stolen. Employees were reluctant to put in suggestions under a surveillance camera; after discussions with members of the Team and the Administrator, this initial location has since been changed.

The Team wanted to have a picnic table outside and waited a lengthy period of time for approval. Due to lack of funds, the team planned a fund raiser, which netted over $500, allowing them to buy three tables. As part of a healthy nutrition project, they had attempted to get fresh, healthy food stocked in the vending machines but, due to vendor recalcitrance, were unable to continue having the machines stocked with healthy food on a long-term basis. Employees perceived the Administrator as giving "no support at all" and felt no appreciation for their work. Members of the HWT expressed disappointment in the lack of participation by other employees, particularly from nursing care staff who have difficulty leaving the unit for meetings or programmed activities. The team is strictly a volunteer group. Similar to Facility I-1, a medical records clerk is the liaison to the facilitators at this facility.

The Team is working on issues that go beyond traditional wellness initiatives and delve more deeply into work organization and stress (room change policy), employee involvement (setting up their own suggestion box), inter-shift communication (unit-based log book), and occupational health and safety (ergonomics training).

Management interviews at Facility I-2 included an interview with the Director of Nursing and four other individual interviews with program managers on 8/10/10 and an interview with the Administrator on 8/17/10. Two of the managers, a unit manager and the director of food services, appeared to be knowledgeable about the activities of the HWT yet another manager, the director of recreation, seemed less enthusiastic, stressed, and annoyed that the Team assumed her staff would be involved in their activities though she was personally supportive.

The director of nursing expressed her support for the HWT but bemoaned the fact that she "used to be a lot more mobile and a lot more visible on the floor than she is right now." In terms of employee involvement, she said that the HWT "has struggled to stay together and it is always the same people doing the same thing" with the "same staffing and double the workload." She seemed knowledgeable about and supportive of their

activities, including stress reduction, the furniture outside, communication problems, and stress issues.

In contrast to employee perceptions, the Administrator in Facility I-2, who has been in her position for nine years, appears to be an enthusiastic supporter of the HWT and expressed her understanding of the link between employee health and quality care: "My philosophy has always been if you keep your staff happy and take good care of your staff they will take better care of your residents." She suggested that their HWT visit another facility's HWT to observe and discuss their common concerns and thought that a day-long HWT conference sponsored by the corporation to meet and discuss their work would be a way to recognize their work. She demonstrated her willingness to make a request of her employer for a modest budget of $500 for the HWT. As enthusiastic as she was about the importance of the HWT, she also expressed frustration at the mounting tensions due to increasing needs of clients and economic constraints which affect staff participation on the Team. While Facility I-2 Administrator was favorable toward the activities of the Team, she relied on the University for facilitating and continuing the effort, including morale building and said it was "like pulling teeth" to keep any employee involvement activities moving, particularly with the high turnover of the facility. She believes it will be challenging to continue the effort at the end of the grant cycle due to the lack of widespread employee participation. From the management interviews and Team self-evaluation, it is unclear at this juncture whether this effort would be sustainable without the outside assistance of the University-based facilitators.

In comparison to the control sites, data from Facility I-2 suggests the Team appears to be actively working with some employee involvement, development of problem-solving skills, perceived lack of support from the Administrator, and an understanding of the strengths needed to overcome barriers.

Facility I-3

HWT self-evaluation was conducted at Facility I-3 on 8/2/10. Participants in the self-evaluation included the Human Resources Director, a CNA, a GNAS, and a medical records clerk. Management interviews were conducted on 8/20/10 and included individual interviews with the Administrator, Activities Director, Housekeeping supervisor, unit manager, and Director of Admissions.

Facility I-3, an intervention site, has 140 beds. There are currently six to eight employees on the Health and Wellness Team; there were four employees participating in the team self-evaluation. Facility I-3 has a Wellness Champion designated by the Administrator who works as the Human Resources Director. Due to the facility's proximity to a more urban area, there are many workers of African descent. Two of the members of the Team attending the self-evaluation were Caucasian, one was Hispanic, and one was an African immigrant, which was fairly representative of the facility.

The Team's major accomplishments over the past three years of the study included communications, ergonomics training, exercise, fresh food, garden, and the weight loss program (which included nutritional information and exercise). The team noted that the weight loss program had a significantly higher turnout rate than the HWT meetings. The Team seemed frustrated by the low turnout to their meetings and lack of participation by other employees, particularly from nursing care staff who have difficulty leaving their

units for meetings. Members of the team also expressed disappointment in the lack of support from the Administration.

The Team is working on issues that go beyond traditional wellness initiatives and delve more deeply into work organization (communications), psychosocial stressors (garden), and occupational health and safety (ergonomics training). With the assistance of the Human Resources Director acting as a Wellness Champion as part of her Administrative responsibilities, it is very likely that this effort is sustainable without the outside assistance of the university-based facilitators.

The Administrator of Facility I-3 has been there a relatively short time (five months). In contrast to employee perceptions, she expressed an overall positive response to the HWT but lacked an understanding of the overall goals of the project or the partnership with the University when she stated: "I think the assistance you [the University researchers] have provided so far has been helpful. I think everyone is very limited for time but at the same time you've got to look at what you're going to get out of it moving forward." She cited the involvement of the Wellness Champion for keeping the team moving forward. Her hopes for the future of the Team were evident when she said, "I'd like to say it would evolve and become more deep rooted in the building, so more people are aware of it and then participating and coming up with different ideas that different employees can participate in." As a young Administrator, she started her career in a management training and leadership development program right out of college and received her license through a program that [the corporation] offered, appeared quite knowledgeable about other programs that [the corporation] offers, and said it was very helpful as an Administrator to be a part of such programs.

The Housekeeping Supervisor at Facility I-3 was actively involved in the garden, a key activity of the Health and Wellness Team. He indicated his realistic support of the goals of the project when he stated: "Sometimes it's easy to say 'work as a team' but it's hard to put a team together how it's supposed to be. But with this, it helps." The Unit Director and Activities Director indicated their knowledge of the importance of the Team as well as the significance of the Wellness Champion as a key liaison. The Activities Director stated: "One of my assistants, is part of the HWT. She keeps me updated but also [the wellness champion] (WC) and I talk a lot about what's going on. I think [the WC] does a really, really good job promoting it. When we're at morning meeting and all the managers are there, she always talks about what's going with health and wellness. And yes it is promoted. I think she's done a good job and she's done a lot to put it out on the forefront." Each of the managers interviewed at Facility I-3 expressed similar sentiments about the importance of the Wellness Champion's centrality to the program since she took on the role. Facility I-3 appears to be actively working with strong employee involvement, development of problem-solving skills, strong Administrative support, and an understanding of the strengths needed to overcome barriers. Though employees have a perception that there is a lack of management support, this project has a strong chance for sustained success.

Facility C-1

Management interviews at Facility C-1 were conducted on 10/15/10 and included an individual interview with the Administrator and a group interview with the Director of

Nursing Services, Director of Recreation, Clinical Reimbursement Coordinator and the Director of Environmental Services.

Facility C-1, a control site, has 142 beds. This site did not have a wellness committee. Alternately, the Administrator suggested interviewing the 4R (Retention, Recruitment, Recreation, and Recognition) Committee. The four supervisors who comprise the facility's 4R Committee (which acts as a fundraising, staff appreciation, and wellness team) were interviewed. Staff at C-1 is very multicultural reflecting the diversity of neighboring urban environment yet all key informants were Caucasian. The 4R Committee had only supervisory personnel and no direct care or nursing staff as members. Thus, no non-supervisory employees were interviewed.

The current wellness initiatives included healthy snacks, suggestion box, walking, and weight loss. The Team is not working on issues that go beyond traditional wellness initiatives except for the Approach Coach program, which is unique to Facility C-1, deals with work organization issues, and was primarily initiated by the Administrator.

The Administrator, who has been at Facility C-1 for seven years and had worked for [the corporation] for 12 years previously, expressed support for employee health and wellness activities including the walking club, flu shots, the no lift program, and suggestion box (which she responds to with public postings by the elevator). When asked about the need for a designated Wellness Champion, she said, "I need to find a volunteer for that. I think I'd need to make up some kind of job description for it. Right now, I'm not going to ask anybody to do anything other than getting their paperwork done." When asked about the impact of the economic downturn and staff cutbacks, she said, "Life gets more difficult when you cut. Every department [except direct care] was cut and we did it so it was spread out evenly among the people who work in that department." Though there are ongoing activities, there is little non-supervisory employee involvement. Unlike the intervention sites, Facility C-1seems unable to actively involve non-supervisory employees in any but the Approach Coach program and does not have any ongoing opportunities for worker empowerment or problem-solving.

Facility C-2

Interviews at Facility C-2 occurred on 10/28/10 and included the Administrator, Assistant Admissions Director, and a Recreation Assistant. Given that there were no managers to interview, the researchers asked the Administrator questions from both the Administrator survey and the manager survey.

Facility C-2, a control site, has 153 beds. The facility has a Wellness Team which has been on hiatus for two years. The Administrator, who has been there for six years, is an enthusiastic promoter of health and wellness activities, particularly walking and nutrition programs, for their employees. She has also tried *ad hoc* activities such as a yoga class, massage, and Reiki for the staff, but has not been able to sustain many in-house programs. She has enthusiastically supported a state-wide corporate-sponsored wellness program, Shape-Up Rhode Island, financially both by paying for her employees and by allowing two of her staff to help coordinate the facility's involvement. Though she expressed her understanding of safety issues for employees, her concerns did not include an understanding of the psychosocial stressors of work: "In general, the population of employees that I have, they're young, a lot of them are unmarried with

children. So, in general, it's not so much the work that's the stress, it's their personal lives that are the stressor."

Two key employees, the Assistant Director of Admissions and a Recreation Assistant (both of whom also do overtime as CNAs) were involved in the aforementioned statewide wellness activities. There has not been a Wellness Team meeting for the past two years.

The current wellness initiatives focus on fundraising walks and strong participation in the statewide initiative for health promotion and exercise. In addition, the facility annually provides healthy eating as part of National Nutrition Month and quarterly massages free for employees on work time. Employees interviewed perceived administrative support as excellent. Aside from the Alzheimer's Walk, the Cancer Walk, and the statewide effort, there is no other coordinated or overall committee focused on employee involvement or health. Though these programs are fairly significant and have involved large numbers of employees, all of the projects are initiated outside of the facility and not by the employees or Administrator. These projects have been sustained for a number of years and it is likely that they will continue in the future. Although the Administrator stated that the vending machines had healthy snacks for the employees, upon observation, this did not appear to be the case. Facility C-2 appears to be in a good position to actively involve non-supervisory employees in externally-driven health and wellness activities but with no internal Wellness Champion or Team, it is unlikely that any internal efforts can be sustained.

Facility C-3

Interviews at Facility C-3 occurred on 10/26/10 and included individual interviews with the Administrator, Director of Nursing (former Wellness Champion), Director of Plant Operations (current Wellness Champion), and a cook. A group interview took place with a laundry worker and a payroll and benefits clerk.

Facility C-3, a control site, has 123 beds. There was a Wellness Team with five to six members, which had not met in a number of months. The current wellness initiatives include healthy snacks, suggestion box, walking, and weight loss. The former Wellness Champion was a charismatic manager who was promoted to Director of Nursing and had to divest herself of the Wellness role due to additional duties of her new position. The Director of Plant Operations succeeded her and currently leads the facility's wellness activities. Though he attends the Corporation's regional wellness meetings, he has not called for facility wellness team meetings to resume, citing time constraints with many responsibilities. The three non-supervisory employees interviewed perceived the Administrator as supportive. With a dormant health and wellness team, it would be difficult for the facility to sustain any ongoing health and wellness or employee involvement activities. The management at Facility C-3 seems unable or unwilling to actively involve more non-supervisory employees in health and wellness activities.

The current Wellness Committee Chair (the Director of Plant Operations) expressed his disappointment that there is only a core group of people involved in employee wellness activities currently. He also chairs the Safety Committee and has considered merging the two groups but fears that safety concerns would dominate wellness. The Administrator at Facility C-3, who had only been there for one and a half years, cited improving staff satisfaction and morale as one of her top three goals along with clinical

capability and customer satisfaction. According to the Administrator, the Wellness Committee meets monthly with six active members but "represents almost all of our departments except nursing, and we've really struggled to get nursing representatives." However, the former and current Wellness Committee chairs who were interviewed expressed frustration with their inability to keep the Committee meeting more regularly and said, "It's been a while since we've had a meeting."

DISCUSSION

This report is the result of an interim qualitative assessment of the interventions through which activities and programs linking employee involvement in health promotion with psychosocial, work environment, work organization, and occupational health and safety at three nursing care facilities in New England contrasted with wellness programs at three control sites. During the course of this interim evaluation, it has become clear that there were distinctions between the activity and engagement in the intervention and control sites. There were barriers and challenges in each facility which impacted the sustainability of each program.

There was strong commitment on the part of each HWT member participating in the self-evaluation from the three intervention sites to go beyond traditional wellness programs and probe more deeply into work organization, psychosocial stressors, and health and safety concerns. Through an examination of the activity level at each facility in the study, it is evident that far more activity occurred in the intervention sites (Facilities I-1, I-2, I-3) than in the control sites (Facilities C-1, C-2, C-3). The intervention sites were involved in most of the sixteen total wellness activities while the control sites' activities were limited to three or four per facility. Several of the intervention sites were also engaged in activities that went beyond traditional wellness activities and included activities which impacted work organization, inter-shift communications, psychosocial stressors, employee morale, and occupational health and safety. In comparison, none of the control sites were involved in any activities beyond traditional employee wellness activities with the exception of Facility C-1 which used an innovative technique for solving psychosocial and work organization problems which could affect employee morale and wellness.

Through further examination of engagement level at each facility in the study, it becomes clear that the number of job classifications of non-supervisory employees engaged in the planning of wellness activities at intervention sites surpassed those of the control sites (with the exception of Facility C-2). The engagement levels at the intervention sites were evidenced by their HWT structure. Higher engagement was evidenced by the ongoing committee structure dedicated to employee health and wellness activities, the presence of outside facilitators from the University, and the assignment of an employee whose responsibility is to maintain and sustain health and wellness activities and programs for the non-supervisory employees of the facility. By comparison, none of the control sites had a functioning HWT, though several of them cited dormant or tangential committees and Facility C-2 only had their employees actively participating in wellness activities driven by a statewide effort of which they were a part. However, engagement at even the intervention sites was severely curtailed based on non-

supervisory employees' (particularly the CNAs) perceived inability to leave their units for HWT meetings or events.

Barriers and challenges to the success of these efforts were evident throughout the interviews and materials reviewed. In each of the intervention sites with the exception of Facility I-1, there was a perceived lack of support of the center Administrator, which led to difficulties getting non-supervisory employees to meetings, difficulties obtaining approval for long-standing project proposals, and difficulties keeping non-supervisory employees hopeful or positive about continuing their involvement with the team. Administrative support is critical for the success of non-supervisory employee involvement in HWT activities. At Facility I-3 one Administrator was supportive and one was not supportive, which led to increased frustration on the part of the HWT members. In addition, in several of the intervention sites, there was the perceived understanding among nursing care employees that they could not leave their units for meetings or activities.

Given the goals of sustainability of programs, worker empowerment, and linking traditional wellness programs to work organization, psychosocial stressors, and employee health and safety, it is difficult to draw any conclusions about sustainability of these efforts at this interim juncture though several of the intervention sites seem to be actively working on engaging non-supervisory employees in activities designed to draw employee involvement, develop problem-solving skills, and understand the strengths to overcome barriers. It appears that one of the intervention sites in particular, Facility I-3, with the assistance of the Human Resources Director acting as a Wellness Champion as part of her Administrative responsibilities, is very likely going to be able to sustain these efforts at employee wellness without the outside assistance of the university-based facilitators. At least one of the other intervention sites, Facility I-2, does not seem poised to continue without the outside facilitators from the University. It is clear that with the exception of Facility C-2 which participates in an expensive statewide effort, there were no ongoing employee participation efforts, regular wellness team meetings, or other employee involvement activities directed at wellness or health promotion occurring at any of the control sites.

The major question that arises from this interim evaluation is whether participatory intervention to develop a program that links occupational health and health promotion through a team of non-supervisory employees over a three-year period is effective and sustainable. After participating in over 16 hours of interviews and evaluation sessions with individuals and groups from each of the three intervention sites and three control sites, it is clear that there is a much more robust program of health promotion at the intervention sites than the control sites.

Higher engagement and activity may be due to three key factors: (1) ongoing team structure dedicated to employee health and wellness activities, (2) presence of outside facilitators, and (3) the presence of an employee designated by the Corporation as a Wellness Champion whose responsibility is to maintain and sustain health and wellness activities and programs for the facility.

Additionally, there are three other factors which have negatively impacted the level of engagement: (1) perceived lack of support of the center Administrator and managers, (2) nursing employees' perceptions that they cannot leave the floor for meetings of the HWT and programs, and (3) frequent turnover of managers.

Development of strong communication with and support for the HWT from management is an important ingredient of success. Administrators and managers in each of the intervention sites offered to assist the HWT with a wide spectrum of support. They offered problem-solving and communication solutions, healthy cooking demonstrations on the units, fresh fruit and granola as snacks, chair massages, and help spreading the word about events and activities. One Administrator from Facility I-2 suggested that the HWT members visit another facility's HWT to observe and discuss their common concerns and thought that a day-long HWT conference sponsored by the corporation to meet and discuss their work would be a way to recognize their work. As willing and interested as these Administrators and managers appeared to be, the perception on the part of the HWTs was that there was not enough communication with or support from management.

In the control sites, though there were no exact corollaries to the HWTs, Administrators and managers offered to support health and wellness activities in each of the sites offering financial assistance, creativity, and suggestions. One manager in Facility C-3, the Director of Nursing, a charismatic leader who had previously and energetically coordinated the health fair and other wellness activities for the facility before her promotion, expressed her frustration with not being able to support health and wellness activities due to lack of time in her new role. Unfortunately, since her promotion, little has been done to continue health and wellness activities in that facility.

In each of the intervention sites members of the teams were extremely committed and went beyond basic wellness programs in spite of the frustrations and difficulties. Facility I-1 sought to include employee morale, work organization, and psychosocial stressors despite lack of support from the campus director. The Facility I-2 Team weathered a number of difficult moments in attempting to obtain administrative support and more employee involvement for their projects (though the Administrator claimed interest in the program); they showed real pride in their accomplishments. Some of the issues are beyond the control of the Administrator, however. For instance, in order to obtain healthy and fresh food for the vending machines, the HWT attempted to obtain a wider range of options from the vendor. They were initially successful but not on a continual basis and had little long-term success in this activity. At Facility I-3, the programs are successful due to one Wellness Champion who coordinates both the Wellness Team and the Fun Committee (which is striving to build a sense of unity among staff). She is also the Human Resources Director, seemed well received by the staff, and is highly organized. However, she also appeared to be experiencing fatigue by the sheer magnitude of the work and to that end, wanted to combine the two committees she leads. The HWT viewed the new Administrator as more supportive than their previous Administrator in that the new Administrator assigned the role of Wellness Champion to one of the managers.

The control sites had a lower threshold of activity and very little employee involvement in team-based overall health and wellness committees. One site, Facility C-2, was unusual for a control site in that they had far more employee involvement in external programs such as the fundraising walks and statewide wellness program than any of the other study sites. In the other two control sites, there were some important similarities in terms of (1) lack of employee involvement and (2) little or no overall committee as an incubator for new and creative health and wellness projects. At Facility

C-1, though it is tangential, the Approach Coach model was a unique and positive development to peer-based conflict resolution and could be an improvement to work organization and psychosocial stressors; it seemed to be working. This could be a sustainable effort in lieu of outside facilitation or trainers as long as the administration continues to support the initiative which, in the words of the Administrator, is "quite costly."

The Administrator at Facility C-3, who seemed quite enthusiastic, said their work has been much more successful in team and morale building. The facility lost its charismatic chair of the committee seven years ago when that manager was promoted to Director of Nursing and since then, she said she "has too much else going on" to head up the wellness activities for the committee. The new chair of the (now dormant) wellness committee boasted massage, a 'lunch and learn' educational series, a health fair and skills fair that had occurred two years ago (after the change in leadership of the committee). The Administrator of Facility C-2 was enthusiastic about extensive employee participation in wellness but the only worker participation was as part of other external (statewide or other) initiatives. These limited activities are only sustainable as long as the outside entities continue and the Administrator continues to support the initiatives.

The model used by the University replaces the individual Wellness Champion with non-supervisory employee wellness teams. It is not yet clear at this juncture whether the model was successful since each of the intervention sites had a different leadership and team configuration. At one time in Facility I-1, the team liaison was a housekeeper who had no phone or email, which made it very difficult for communications to occur. The medical records clerk then volunteered to be the contact. At Facility I-3, a medical records clerk was the team liaison until the HR director was assigned the role.

Each of the facilities in the study had undergone serious cutbacks in staffing due to the economic recession and the slow economic turnaround in that region of the country. Five of the six facilities had employee hours cut back. All six of the facilities had their employee wellness funds eliminated. These economic changes have had a large impact on activities for employee health and wellness. For instance, two of the centers received picnic tables. At Facility I-1, the administrator paid for it out of his own discretionary funds and at Facility I-2, the HWT raised the funds through fundraisers.

While most facility Administrators appeared to support the project, not all employees perceived management's role as positive. One facility Administrator (Facility I-1) offered the services of the company's public relations person to promote the HWTs plan to offer a farmer's market though he was doubtful that it would garner approval from his supervisor, the campus director. When the campus director finally, after many months, said no to the farmer's market, one CNA summed up her emotional state at the HWT self-evaluation: "It hurts, really, it hurts that you try to do something for six months or a year and then suddenly you can't." The Team had conceived of the farmer's market as an idea that would have been beneficial to both staff and residents/families one year earlier. The Team originally thought that the campus director had been ignoring the Team. The Administrator had known the farmer's market hadn't been approved but had not made that immediately clear to the employees on the Team. A highly charged discussion of this issue arose at the self-evaluation which provoked strong reactions resulting in one person in tears and another leaving the room abruptly. The team expressed their frustration with the campus director, citing this as his disrespect for them.

If the Administrator were able to respond in a more timely manner to HWT proposals, this tension might have been avoided.

Due to economic constraints, many of the employees cited loss of hours, cutbacks in funding for staff-related projects, and increased monitoring of their work hours as sources of frustration. A common complaint was similar to the one cited above, where employees often had to leave the team self-evaluation sessions early because they were not permitted to stay in the facility after their shift officially ended, even if they were in a meeting. These factors also were cited as indicators of lack of employee involvement and participation in HWT programs. In an atmosphere where employees perceive the Administrator to have enormous control, where cutbacks in hours have occurred, misunderstanding and mistrust often occur. It appears that there is an employee perception of lack of Administrative support in all three intervention sites. Many non-supervisory employees cited frustration, anxiety, and fear over recent staffing cutbacks in hours. This, along with a non-union environment, contributes to a climate of fear in each of the HWTs.

As the economy worsened, management decisions involved cutbacks in staffing, and units are running "short" (of staff), putting employee involvement efforts at risk. This study reveals that short staffing and Administrative pressures often result in poor attendance of staff in meetings and programmed activities. One of the only wellness activities in the study in which employees seemed eager to engage regardless of economic or other constraints was the weight loss program. When the research team asked Administrators if they would be willing to pay employees to work overtime to attend meetings of the HWT, they all agreed it would be possible. However, the research team did not find any instances where this had happened during the three years of the study.

In each of the intervention sites, administrators' lack of action or perceived lack of support led to demoralization of the HWT. The outside facilitators played a role in redirecting or building on the positive to keep the employees from losing hope. The fact that members of the Teams continued to participate after such disappointment showed the employees' commitment to the overall program. Each of the Administrators in the intervention sites appeared committed to the overall goal of employee involvement toward structural change but it was unclear as to whether their wellness programs would continue without the outside facilitation.

Appendix A

Interim Evaluation Instruments: Intervention Sites

Interim Evaluation Self Evaluation Questions for HWTs

1. How has the health and wellness team benefited employees at the center?

2. How has it benefited you personally?

3. Do you think that working in a team setting such as this is better than approaches used in the past? Why or why not?

4. Has this experience been what you expected it to be? If not, how is it different?

5. In what ways do you feel the health and wellness team has met the objectives of improving the health and well-being of the employees at the center?

6. What do you think has gone well with the team and where do you think there could be improvements?

7. Are there ways that center management and administration could work better with the team to make changes at the center?

8. Are there ways that UMass Lowell could work better with the team to make changes at the center?

9. What do you feel are some of the challenges that the team faces?

10. What would you change about how the health and wellness team works or what it is doing?

11. How do you feel about the future and sustainability of the team?

Interim Evaluation Instruments: Intervention Sites

Interim Evaluation Questions for Administrators

1. How do you think the health and wellness team has been functioning over the last two years?

2. How does the team's role and function relate to your expectations for the team?

3. Has this partnership with the university been what you expected it to be? If not, how is it different?

4. How would you like to see the team function in the future?

5. In what ways do you feel the health and wellness team has met the objectives of improving the health and well-being of the employees at the center?

6. What do you think has gone well with the team and where do you think there could be improvements?

7. In a number of cases health and wellness programs could benefit from involvement of various departments or managers. Is there a way to involve them in planning or promoting HWT programs? Which departments or managers could be involved in supporting health and wellness programs? How could that happen?

8. Are there ways that UMass Lowell could work better with the team and/or with center management to make changes at the center?

9. What would you change about how the health and wellness team works or what it is doing?

10. How do you feel about the future and sustainability of the team?

Appendix A

Interim Evaluation Instruments: Intervention Sites

Interim Evaluation Questions for Managers

1. Are you aware of the activities of the center's health and wellness team? If not, how would you like to be better informed?

2. Are there ways you might be able to contribute your expertise or support to the team in developing health and wellness programs for the center?

3. Are there ways that more employees could be involved in planning or participating in health and wellness activities to improve the health and well being of center employees?

4. What role might you be able to play in involving more employees?

5. What is the best way to communicate information about team projects or activities?

6. Could you talk about any specific employee health needs you see at the center? Are there activities you might suggest?

Interim Evaluation Questions for Administrators

This interview is intended to be a follow-up to a series of interviews and focus groups we conducted at your center about three years ago regarding health and safety and wellness issues.

1. How long have you been the administrator at this center? How long have you worked here? How long have you worked for [the corporation]? Have you been an administrator previously?

2. What are your goals for the center over the next 3 years?

3. Can you tell us about any initiatives that have taken place or are planned in the next six months to improve the health of employees?

    a. Probe – This includes health and safety and wellness.

4. Can you tell us how the wellness program here functions?

    Probes
    a. Wellness champion?
    b. Committee
    c. Newsletter
    d. Minutes posted
    e. How often does the committee meet?
    f. Describe the membership on the committee
    g. Do they have a budget?
    h. If they have an idea, or propose a project, how does that turn into reality?
    i. Is there a procedure/ approval process?

5. Can you describe some of the wellness activities that have taken place here in the past two or three years?

6. How effective do you think these have been? How many people would you say participate in activities?

7. What would you say are the most important health and safety issues for employees that need to be addressed?

    Probes
    Falls
    Accidents
    Injuries
    Stress

8. What would you say are the most important personal or individual health issues of employees that need to be addressed?

Probes
    a. Overweight
    b. Physical fitness
    c. Diabetes

9. Are there any programs at the center to encourage healthier lifestyles?
Probes
    a. Healthy meals from dining services
    b. Healthy choices in vending machine
    c. Exercise equipment

10. Are there any projects you'd like to see the wellness program address in the next year or two?

11. Do you have anything you'd like to add?

Interim Evaluation Instruments: Control Sites

Interim Evaluation Questions for Wellness Champions

1. What is your position? How long have you worked at this center? Have you always been in this position? How long have you worked for [the corporation]?

2. How long have you been the wellness champion here? Can you describe your role?
   Probes
   a. Responsibilities
   b. Part of your job responsibilities or extra?
   c. If not part of job – how hard is it to take time off for wellness activities?

3. Is there a wellness committee here? How long has it existed? Who is on it? How often do you meet?
   Probes:
   a. What shifts are represented?
   b. How many members?
   c. How stable or consistent is the membership?

4. What does the wellness committee do?
   Probes:
   a. Where do you get ideas for activities?
   b. How do you plan activities?
   c. What do people do outside the meetings?
   d. Who decides what the committee will sponsor?
   e. How are activities paid for? Do you have a budget?

5. Is there any way the committee or the wellness program could be improved?

6. IF NO COMMITTEE: Are there other employees who are especially interested in wellness programs or who help with planning and carrying out activities?
   Probes:
   a. Where do you get ideas for activities?
   b. How do you plan activities?
   c. What do people do outside the meetings?
   d. Who decides what programs or project are sponsored?
   e. How are activities paid for? Is there a budget for wellness activities?

7. Can you describe some of the wellness activities that have taken place here in the past two or three years?
   a. Have any of these programs been long term – 4 weeks or more?
   b. How were you able to keep people involved?

8. Can you take us through the process of developing an activity or program from the beginning to putting the activity in place?

9. What wellness program achievements are you proudest of?

10. Have there been any roadblocks to getting things done? What challenges do you see in planning and carrying out activities or programs effectively?

11. What kind of support do you get from management or administration?

12. Participation
    a. How many people would you say are _very_ active in wellness programs at the center?
    b. How many employees participate in wellness activities? What activities seem to be most popular?
    c. Are all departments represented?

13. What would you say are the most important employee health issues that need to be addressed?

14. What projects would you like to see the wellness program address in the next year or two?

15. Do you have anything you'd like to add?

Interim Evaluation Instruments: Control Sites

Interim Evaluation Questions for Wellness Committee Members or Activists

1. What is your position? How long have you worked at this center? Have you always been in this position? How long have you worked for [the corporation]?

2. How long have you been on the wellness committee or active in wellness activities? Can you describe what you do in relation to wellness activities?

3. How difficult is it for you to take time off to work on wellness activities?

4. Is there a wellness committee here? How long has it existed? Who is on it? How often do you meet?

5. What does the wellness committee do?

    Probe
    a. Where do you get ideas for wellness programs or projects
    b. How do you plan activities?
    c. What do people do outside the meetings?
    d. Who decides what the committee will sponsor?
    e. How are activities paid for? Do you have a budget?

6. Can you take us through the process of developing an activity or program from the beginning to putting the activity in place?

7. Is there any way the committee or the wellness program could be improved?

8. If NO Committee
    a. Where do you get ideas for wellness programs or projects
    b. How do you plan activities?
    c. Who decides what programs get put in place?
    d. How are activities paid for? Is there a budget for wellness activities?

9. Can you describe some of the wellness activities that have taken place here in the past two or three years?

10. What wellness program achievements are you proudest of?

11. How many people would you say are <u>very</u> active in wellness programs at the center? What do they do? Are they committee members?

12. Have there been any roadblocks to getting things done? What challenges do you see in planning and carrying out activities or programs effectively?

13.   What kind of support do you get from management or administration?

14.   Participation:

    a. How many people would you say are <u>very</u> active <u>in wellness</u> programs at the center?
    b. How many employees participate in wellness activities?
    c. What activities seem to be most popular?
    d. Are all departments represented?

15. What would you say are the most important employee health issues that need to be addressed?

16. Are there any projects you'd like to see the wellness program address in the next year or two?

17. Do you have anything you'd like to add?

A Qualitative Evaluation of the Effects of an Intervention Using Employee Participation and Integrating Occupational Safety and Health with Workplace Health Promotion in Long-Term Care Nursing Facilities

Jane M. Fleishman, M.S.

Table of Contents

Abstract

The assessment of a participatory health promotion (PHP) intervention linking worker health promotion (HP) and occupational health and safety (OSH) in three long-term care nursing facilities indicates that particular motivators such as consistency, worker participation, and management support among others have a significant effect on the potential for sustaining the program and ultimately improving employee health outcomes when compared with non-PHP control sites owned by the same corporation. Success was defined as a program with a participatory structure, an ability to integrate OSH with HP, and the ability to create changes at the facility. Projects implemented by the PHP sites addressed a broader focus than the non-PHP sites, including attempts to change work environment factors in addition to activities that focused on individual health concerns. The key factors for successful wellness programs integrating employee participation and an integration of HP and OSH included (1) presence of strong leadership both from the administration and the Health and Wellness Team, (2) the consistency of a Wellness Champion with adequate time and support to follow through, (3) adequate funding and resources for employee wellness to prioritize employee health, (4) employee awareness and commitment to the planning of and wellness activities as a priority for staff, (5) attention to the effects of stress and the attendant relief from stress, (6) an approach to time and innovative ways to handle universal issues of lack of time for planning and attending wellness events and activities, (7) effective and consistent communications between administration and employees, (8) creating an organizational culture and structure in which employee wellness is an inherent part of the facility, and (9) wellness planning teams that had consistent and strong commitment from staff in all departments including clinical care.

Keywords: workplace health promotion, occupational safety and health, wellness, employee health, employee participation.

Introduction

Workplace health promotion programs generally focus on individual health concerns such as smoking, exercise, and weight loss. In many cases, however, the workplace environment can contribute to an individual's ability or inability to improve their health. Psychosocial stressors, work organization, ergonomic concerns, and occupational exposures can also contribute to the health and quality of life of workers. This paper describes the evaluation of a participatory intervention to develop a program that links occupational health and health promotion through a team of non-supervisory employees over a three year period. The intervention is compared to three control sites which had mature, management-driven health promotion programs at the beginning of the study. All sites are skilled nursing facilities within the Northeast Region of a large health care corporation. This study was part of the research project, "Promoting Caregivers' Physical & Mental Health via Transdisciplinary Intervention" (ProCare) a project within the Center for the Promotion of Health in the New England Workplace (CPH-NEW), a NIOSH Work Life Center of Excellence, a collaboration between UMass Lowell and the University of Connecticut (Punnett, 2006). There were two unique aspects of this intervention: (a) the implementation of a participatory health promotion (PHP) intervention model and (b) the integration of occupational health and safety (OSH), including work organization, psychosocial stressors, ergonomics and musculoskeletal training, and other workplace-focused programs with workplace health promotion (HP). In the PHP sites, non-supervisory health and wellness teams (HWT) were initiated and facilitated by the university researchers and evaluated by the research team. The non-PHP sites had mature health promotion programs at the beginning of the study. They received no services from the researchers, but were left to develop on their own. All six sites were evaluated twice during the study period. The assessment of the teams addressed the following factors: (1) were the teams/committees functional or did they rely on particular individuals? (2) what was the nature of the employee

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participation in a given facility? (3) did the team decide upon and plan programs themselves or did they respond to management concerns or outside opportunities (such as voluntary health organization fund-raising walks for Alzheimer's disease)? Assessment of the integration of OSH and HP addressed: (1) did the teams address individual health issues only or did they also address issues such as work organization, psychosocial stressors, ergonomics and musculoskeletal training, and other occupational safety and health-related concerns? (2) to what extent did activities go beyond individual health concerns to changes in the workplace environment or organization? All worksites in the study are part of a single healthcare corporation; none of the employees are unionized.

The goals of the research project were to (a) design, implement, and evaluate a PHP program in a selected number of facilities, and to describe the site and group characteristics (structures, group dynamics, manager support, etc.) associated with successful initiation or inhibition of a program and (b) compare the effectiveness of the worker health participation (HP) and the investigator-initiated PHP program on the same health and work outcomes, and (c) to investigate whether the PHP programs have higher participation levels or greater health benefits than HP. The key questions to be covered in this report include: (a) how the actual implementation corresponded to the planned activities, (b) what unanticipated obstacles or opportunities arose in the interventions, (c) where new or revised approaches are needed to overcome obstacles and allow for more sustainability, and (d) how the PHP sites compared with the non-PHP sites. A set of themes illustrating motivators and challenges consistent throughout all worksites was then used as a basis for assessment.

Each of the PHP sites has a wellness program carried out by a non-supervisory employee involvement committee assisted by UML researchers under the direction of Marian Flum, ScD, Director of qualitative research for CPH-NEW. The model used for each of the PHP sites integrated

a non-supervisory employee involvement team focusing on health and wellness that went beyond the traditional HP activities and included work organization, ergonomics and musculoskeletal concerns, psychosocial stress, work environment, and other OSH factors (Punnett et al., 2009). Each team had a 'point person' to act as leader of the team who eventually evolved in to the Wellness Champion at several facilities. Ideally, the teams met every two weeks (though not all kept to that schedule) to identify issues of concern, prioritize them, plan and implement programs, and evaluate each activity. Dr. Flum and a group of university-based research assistants worked closely with the teams to assist them with problem-solving, minutes, and research.

To protect the confidentiality of participants in the study, the facilities are not referred to by name herein. The nursing care facilities at which intervention occurred are herein referred to as I-1, I-2, and I-3 and are located in Agawam, North Andover, and Westford, Massachusetts respectively. Non-PHP control sites include the following facilities referred to as C-1, C-2, and C-3, located in Lowell, Massachusetts; Warwick, Rhode Island; and Westbrook, Maine respectively. For purposes of comparison and evaluation, the non-PHP control sites were assessed by the UML consultants but did not receive and further services from UML. Interim and follow-up evaluation interviews were conducted during the final research evaluation phase in each of the PHP and non-PHP sites.

Method

The research design for this evaluation consisted of participatory and qualitative research using (1) team evaluations, (2) key informant interviews, (3) employee focus groups, and (4) site visit observations and materials review to assess sustainability, worker participation, and the team's ability to go beyond traditional HP programs.

(1) *Team Self-Evaluations.* The intent of the participatory research portion of the evaluation design was to conduct an evaluation with existing Health and Wellness Teams (HWTs) at each PHP site

and to interview wellness team members and/or supervisors at each non-PHP site. The HWT evaluations were conducted with team members as a group at each PHP site. Team membership at such evaluation sessions included Certified Nursing Assistants (CNAs), Geriatric Nursing Assistant Specialists (GNASs), clerical staff, housekeepers, food service workers, recreation therapists, and educators. In addition, team members were interviewed individually at each of the PHP intervention sites.

(2) *Key Informant Interviews.* Key informant interviews included the facility administrator, director of nursing, department heads, program directors, unit managers, and other key personnel involved in health, wellness, or a particular HWT or wellness project. These interviews were conducted individually at both the PHP and non-PHP sites.

(3) *Employee Focus Groups.* To gather data from employees who have not been involved in the project, the design intent was to conduct two (2) employee focus groups drawn somewhat randomly from a cross-section of departments at each facility, with separate sessions for first and second shift employees. At one of the PHP sites (I-1) and one of the non-PHP sites (C-1), only one employee focus group occurred due to scheduling problems; in all other sites (I-2, I-3, C-2, and C-3), researchers were able to conduct two employee focus groups at each facility. Modest cash incentives were announced and given to all non-supervisory employees who attended the employee focus groups. An average of six employees attended each focus group.

(4) *Site Visit Observations and Materials Review.* At each site visit, the researchers visited and observed any indoor spaces (the employee lounge, break room, vending machines, or bulletin boards), outdoor spaces (employee picnic areas or gardens), and printed materials (employee newsletters, flyers, or informational literature) devoted to HP, OSH, or other employee wellness

activities or information. Such observations and reviews were helpful to give the researchers a glimpse of the work of the team on the physical environment and the organizational climate.

Each team evaluation, employee focus group, and key informant interview was conducted by two researchers, one acting as facilitator and the other as recorder and note-taker, recording all verbal and non-verbal communication, such as facial expressions, body language, nods, non-verbal emotional responses, or head shaking. Interviewers included an independent researcher evaluator, Jane Fleishman, and two doctoral students from UML, Yuan Zhang and Rajashree Kotejoshyer.

As designed, all qualitative evaluation sessions were digitally recorded, so that a complete record of the session could be obtained. All evaluation instruments and methods were approved by the university's Institutional Review Board. Data from the final evaluation interviews were analyzed for general themes at each site and across all study sites. Triangulation, in which data are compared across multiple sources and methods, was used as a check on reliability and validity. In keeping with the design and methodology of participatory research, team evaluations were conducted with members of the HWT as part of a regular meeting in each of the PHP sites. Discussion questions were designed to cover the major themes of this research project including workers' perceptions of: (1) their greatest health risks (occupational or non-occupational), (2) management's interest in their well-being, (3) challenges regarding their work as a team in relation to center management and administration, (4) the impact of outside facilitators from the university, (5) workplace conditions and whether they meet workers' social, psychosocial, and environmental needs, and (6) future sustainability of the project.

Key informant interviews occurred at each of the six sites of the study. The questions for Administrators differed from those used for managers and department heads and non-supervisory

employee interviews (see Appendices). Discussions with Administrators delved more deeply into the (1) management expectations and perceptions about the health and wellness, (2) employee health and safety concerns, (3) perceptions of the team and its sustainability for the future, and (4) interactions between the health and wellness activities and other corporate programs, particularly with regard to recent changes at the corporate level regarding medical records, leadership styles, and culture change.

At the PHP sites, the interviews with managers and department heads focused on their (1) awareness of health and wellness activities generated by the team, (2) support that they might be able to offer these programs, (3) their suggestions about increasing employee involvement and participation in health and wellness programs, (4) communications issues, (5) issues related to the psychosocial work environment, (6) work organization, and (7) any other employee health and safety needs of concern to them as departments heads and managers.

At non-PHP sites, information about current or past wellness activities was gleaned from key informant interviews, employee focus groups, site observations, and materials reviews. Since there was not an HWT in any of the non-PHP sites, those involved in each non-PHP facility's closest approximation of an HWT were interviewed as a group. These included members of a Wellness Committee, if there was one, or with health promotion activists.

The interviews, team evaluations, and employee focus groups took place between May and August, 2011 and a total of 67 interviews were conducted[1]. There were 44 key informant individual interviews, six team group interviews, and 11 employee focus groups. At facility I-1, there were 11 individual interviews, a group interview with the HWT, and two employee focus group discussions;

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[1] An interim evaluation was conducted between August and October, 2010 for which a separate has been filed.

at Facility I-2, there were nine individual interviews, a group interview with the HWT, and two employee focus group discussions; at Facility I-3, there were nine individual interviews, a group interview with the HWT, and two employee focus group discussions; at Facility C-1, there were eight individual interviews, a group interview with the wellness team, and one employee focus group discussion; at Facility C-2, there were eight individual interviews, a group interview with the wellness team, and two employee focus group discussions; and at Facility C-3, there were six individual interviews, a group interview with the wellness team, and two employee focus group discussions.

All interviews and group discussions were digitally recorded and transcribed, themes were postulated, and an analysis was conducted using an application which created a quantifiable database of thematic data with the help of Dr. Stuart Robertson who analyzed all transcripts using nVivo©, a qualitative analysis software program. Themes included areas of motivation and obstacles to sustainability. Some of the themes (e.g., leadership support) were seen as both motivators and challenges, based on the facility. A comparison of the intervention and control sites was conducted focusing on (1) integration of HP and OSH, (2) effects of PHP model on team, and (3) sustainability of PHP as a model. The evaluation interviews, focus groups, site visits, and materials reviews provided significant and sometimes contradictory data on employee and management perceptions of the integration of HP and OSH concerns, which are reported in the *Discussion* section. The analysis is covered in the *Results* section.

Results

The evaluation research elicited much data on each program including factors which have a substantial impact on program success: (a) program projects and accomplishments, (b) employee participation, (c) integration of OSH and HP, (d) themes related to motivators and barriers of the

program. Each of the themes identified across all six facilities were considered integral to success and presence or absence of any of these are discussed. Comparisons between PHP and non-PHP sites as evidenced by evaluations, interviews, employee focus groups, site visits, and materials review.

Program Accomplishments by Site

Accomplishments were evaluated through evidence of programs carried out, activities proposed, effects on individual employees, effects on the facility, and effects on the corporation. Each of the facilities carried out programs during the course of the research period. The major accomplishments and frustrations, impacts on employees, the facility, and the corporation overall are described. A comparison of intervention and control sites is included at the end of the *Results* section. An in-depth description of each facility follows with a table and summary of all accomplishments at the end of this section.

Intervention Sites

Each intervention site is referred to herein as a PHP site and has a functioning Health and Wellness Team (HWT) with regular meetings and outside facilitation from UML.

Facility I-1

At Facility I-1, projects and the major accomplishments of the PHP through their HWT included an ergonomics training program conducted by UML, healthy food in vending machines, picnic tables for non-smokers, a redesign of the employee break room, and stress management programs. Unlike the other PHP sites, they did not engage in a weight loss program. The team showed pride in their accomplishments and discussed them knowledgeably. They were interested in integrating OSH and HP through an idea to create a farmer's market on their campus but were unable to do so due to their inability to gain management approval. They showed amicability in their team process, relating their history, growth, and accomplishments. Many of the team members voiced a sense of personal

empowerment and a change in the center through their work with the HWT and a change in leadership. The Wellness Champion articulated it this way: "I think we're getting a feeling of continuity, a feeling of people caring about other people." Though it was not an accomplishment, it is important to note that the HWT attempted to integrate OSH and HP through a major effort to create a farmers market (discussed further in *Motivators and Challenges* section).

Facility I-2

At Facility I-2, projects and the major accomplishments of the PHP through their HWT were initially established by surveying employees, a practice they have continued throughout the study period. Accomplishments at Facility I-2 included training and projects initiated by the HWT: ergonomics training conducted by UML, healthy meals in the vending machine, purchase of picnic tables and lawn furniture to provide a place to employees to cope with psychosocial stress, an extensive walking program, healthy recipes, and a weight loss (Biggest Loser) program. In addition, they also engaged in a short-term corporate-sponsored walking program. Many employees and managers agreed that the ergonomics and musculoskeletal training had the greatest impact on staff and that it was considered an "excellent training." There was an impact on the entire facility with a follow-up to the training of an ergonomic analysis and redesign of workstations in the facility. According to the plant manager, the training went well beyond the classroom with recommendations for individual workstations: "They spent time at each person's station and try to make things better... recommendations that made quite a difference."

In addition to ergonomics and musculoskeletal training, another major impact on the individual employees was weight loss. The major impact on the facility was an increased awareness of wellness, which was articulated by one of the unit managers:

> "...increasing the employees' awareness of how weight and cardiovascular health impact your ability to function. I think that was important. They've certainly made a lot of people more conscious about that."

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The Director of Nursing at Facility I-2, who had been at the center for 12 years, discussed the positive impact of the wellness activities on the center:

"It makes the staff feel like they're a part of something. I think they feel as if people care about their wellness and they care, and they realize how stressful their jobs are. They do feel like they belong."

Facility I-3

At Facility I-3, projects and the major accomplishments of the PHP through their HWT included ergonomics and musculoskeletal training for staff conducted by UML, a weight loss (Biggest Loser) program initiated by the team, healthy food in vending machines, fruit baskets for staff on each unit, a cookbook, a vegetable garden which has continued for two years, and a selection of fruit bowls, salads, and healthy sandwiches provided daily by the kitchen at reduced rates ($2). There was a flurry of programmatic activity sponsored by the HWT at Facility I-3, as evidenced by this statement from one of the unit managers regarding the extent of the weight loss competition extending beyond work and the garden extending beyond individual staff members:

"The Biggest Loser, we've gone through two cycles with that, and the second cycle had a lot of that stuff for at home, which the staff was excited about, doing some of that stuff not only here at work, but keeping a log of what you're eating. As far as the garden, this is the second year that we've done that. We have some of our residents that participate in that also. So it's just not the staff, but the residents and growing things and then also activities being involved with some of the stuff that they incorporate that into an activity, going outside and all."

The weight loss program had a major impact on individual employees and the major impact on the facility was the availability of healthy food choices through the kitchen and the garden, which has increased in size and staff participation. More staff members were involved in the last year of the research program —in planning, decision-making, purchasing, planting, weeding, harvesting, and distributing to both staff and residents. An additional impact on the center was an increased awareness of wellness. The corporate-sponsored walking program (10,000 Steps) used pedometers and a competition, though it was not received highly by any of the staff due to two factors: (a) most

of the pedometers broke and (b) there was no management follow-up soon after the initial burst of enthusiasm.

Control Sites

Each control site is referred to herein as a non-PHP site and none of these sites have a HWT nor any outside facilitation from UML. Researchers from UML chose these control sites because they had a mature health promotion program at the start of the study. Each of the non-PHP sites had, at one time, a functioning wellness committee. To gather data regarding these sites, existing wellness committees or wellness activists were sought for interviews.

Facility C-1

Facility C-1, a non-PHP site, had no wellness committee. Workers did not seem to be involved in the planning. Their wellness activities were all corporate or facility-sponsored and centered on providing free food for staff, hosting raffles and drawings, and conducting weight loss programs. They also had periodic activities including a seasonal walking program, massage therapists from time to time, healthy recipes, and health snacks. At one time, they had a lecture series on how to deal with difficult people, though it did not seem to be repeated and it was not clear how long ago that had occurred. Though there was much enthusiasm and support for the idea of supporting staff, they were not consistent in their employee wellness activities which made it difficult to determine impact. Two employees spoke about the sporadic and inconsistent nature of wellness in Facility C-1. An employee active in corporate-sponsored wellness programs illustrated the difference between PHP and non-PHP wellness programs:

> "We kind of vacillate in and out with our wellness. I mean we have the diet program, walking program and all that and we do it consistently for a while and then we don't do it again anymore, and then we go jump back on it again. We have trouble maintaining our focus on the wellness when there's so much else."

Another employee fondly recalled a wellness event which had occurred many years prior to the start of the research which had not occurred again:

> "Gosh, one year we did an outdoor barbecue for staff with a dunk tank, water balloons, water guns, and to this day -- that's probably five years ago we did that -- that still stands out in my mind as something. The staff just had a blast."

Facility C-2

Facility C-2, a non-PHP site, had no wellness committee. Instead, they had a small group of very active employees who spearheaded employee participation in a well-developed externally-based wellness program, Shape Up Rhode Island, in addition to other specific programs. Their programs included weight loss, healthy recipes and snacks, a seasonal walking program, a quarterly visit from a massage therapist, and periodic yoga classes. They also participate in the Alzheimer's Walk each year with a contingent of employees walking as a team. Once a year, they hold a health fair. They recently began a softball team and the first game elicited tremendous response from the employees in the facility, creating not only an exercise, but a stress reliever, and a team-builder. The Administrator for Facility C-2 acknowledged employee stress and the importance of wellness activities:

> "I think it makes the staff feel like they're a part of something. I think they feel as if people care about their wellness and they care, and they realize that, how stressful their jobs are. I think that's an acknowledgement of the fact that they are under a lot of stress."

Employees at Facility C-2 expressed much enthusiasm for the wellness activities. One impact discussed by one of the employees in a focus group was her heightened awareness of wellness and its intersection with mental health:

> "I think that the most important thing from all of this should be that people need to realize that they have to focus on health and wellness in order to have quality to their life. Because you cannot be an employee that comes into work timely, that isn't calling out sick, unless you're a well employee. And it's not just physical. It's also mental. It's not just the one physical component, there's so much more that goes into health and wellness."

Facility C-3

Facility C-3, a non-PHP site, had a non-functioning wellness committee. Their wellness activities were primarily directed by the Wellness Champion, focused on the individual, and included healthy snacks, a seasonal walking program sponsored by the corporate office (10,000 Steps), and a corporate-sponsored weight loss program.

The Wellness Champion expressed his disappointment that only a core group of employees participate in wellness activities. He also chairs the Safety Committee and has considered merging the two groups but fears that safety concerns would dominate wellness. The Administrator, who had only been there for two and a half years, cited improving staff satisfaction and morale as one of her top three goals (along with clinical capability and customer satisfaction). According to the Administrator, the Wellness Committee meets monthly with six active members and "represents almost all of our departments except nursing, and we've really struggled to get nursing representatives." However, the former Wellness Committee chair expressed frustration with his inability to keep the Committee meeting more regularly and said, "It's been a while since we've had a meeting." The current Wellness Chair indicated that the Wellness Committee had not met in one year. Reduced absenteeism was cited by one of the unit managers as a major impact of the wellness programs and, when asked about impacts on the center as a whole, said she spends more of her "energy on staffing and less on issues with health."

The Administrator cited the ancillary departments for being involved in making the wellness activities successful but implied that the wellness committee was still conducting regular meetings:

> "I'd have to pull the numbers. But one thing I would say is, the ancillary departments do a lot of focus on wellness. They each have someone who participates at least sometimes on the wellness committee, very into wellness in the center, into making sure that they're taking care of their staff."

Table 1 indicates the projects and accomplishments that occurred during timespan of the research project and illustrates the central theme that intervention sites achieved far greater success with

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projects accomplished than the control sites. One of the projects, a walking program, was initially solely sponsored by the HWTs in the intervention sites but in 2011, a corporate-sponsored walking program was begun that was riddled with problems including faulty pedometers and lack of follow-up. This created frustration and dismay among employees and was seen by all as a programmatic failure.

Table 1. Activities for Employees Sponsored by Individual Centers and/or Participatory Health and Wellness Teams in PHP Intervention and non-PHP Control Sites

	HWT or Comm[2]	Ergo[3]	Hlthy Vend Food[4]	Picnic Tab[5]	Break Rm[6]	Stress Mgt[7]	Walk Prog[8]	Hlthy Rec[9]	Wt. Loss Prog[10]	Hlthy Snks[11]	Cook Bk[12]	Garden[13]	Hlthy Mls[14]	Other[15]
Facility														
I-1	✓	✓	✓	✓	✓	✓	✓	✓						
I-2	✓	✓	✓	✓				✓	✓	✓16				
I-3	✓	✓	✓			✓			✓	✓17	✓	✓	✓	
C-1							✓	✓	✓	✓				✓18
C-2							✓	✓	✓	✓				✓19
C-3			✓				✓		✓					

[2] Presence of a HWT or wellness committee
[3] Musculoskeletal or activities focusing on ergonomics
[4] Healthy food in the vending machines
[5] Picnic tables and other lawn furniture
[6] Redesign of the employee break room
[7] Stress management classes
[8] Walking programs, either employee-sponsored or corporate-sponsored
[9] Healthy recipes primarily from corporate office
[10] There was some discussion of Weight Watchers© but most of the facilities used the Biggest Loser© model
[11] Healthy snacks provided for free for employees and residents
[12] Cookbook featuring healthy recipes from employees
[13] Planting, maintaining, and harvesting on-site for employees and residents
[14] Providing healthy low-cost meals to employees through the facility
[15] Includes periodic or one-time only events
[16] Including handmade fruit baskets by HWT members
[17] Including handmade fruit baskets by HWT members
[18] Periodic massage, yoga, and a lecture on wellness
[19] Periodic massage, yoga, softball team, and annual health fair

Employee Participation

A primary focus of the research project was the question of whether non-supervisory nursing staff (i.e., CNAs, GNASs, nurses) would be involved in wellness activities in a facility based on an employee participation model. Effects of employee participation as part of health promotion (PHP) included team functionality, nature of employee participation, team autonomy, creativity of team, origin of projects, generation of proposals, presentation of ideas to management, and follow-through. Both the PHP and the non-PHP sites had a difficult time with decision making power and had trouble obtaining participation from clinical staff. Each of the HWTs had an easier time getting ancillary staff to attend their meetings than clinical staff, due to staffing shortages, time, and clinical care responsibilities. Employee participation also included staff participation in wellness activities. One PHP and one non-PHP site were somewhat more successful in getting clinical staff to participate in wellness activities in the planning of those activities (I-3 and C-2). When employee participation in the planning or activities is low, lack of time and short-staffing are often cited as barriers. These issues are discussed in more depth in the section on *Motivators and Challenges*.

Employee participation is often strongest at the start of a team. Participation tends to be cyclical throughout the evolution of a team.

At Facility I-1, employee participation on the HWT was strong at the outset of the research project with a large amount of the team's energy expended on a Farmers' Market proposal that integrated both individual HP and workplace OSH factors, an elaborate plan on their facility's campus which was enthusiastically endorsed by the center administrator. The proposal was ultimately rejected, after which a large drop off of team members occurred. Though the number of projects and accomplishments at Facility I-1 was lower in comparison to those in Facilities I-2 and I-3, employee participation in wellness activities was moderate and steady in all projects implemented. One HWT member frustrated with the lack of employee participation on the team at the end of the

research project noted that the project itself may have been too large and the concomitant frustration that ensued after such high expectations was an additional barrier to surmount:

> "I wish our farmer's market would have worked. It was a good idea; I think it was a little big for us, where we were going with it, because we got so excited, like this could be."

At Facility I-2, employee participation in the HWT had been quite high at the start of the project yet involvement of clinical staff diminished due to frustrations with their decision-making process and clinical responsibilities. From an initial high employee participation rate on the team to a lower number of non-supervisory clinical staff at the close of the research period, employee participation in wellness activities is highest in the walking program; other activities are less well attended by non-supervisory clinical care staff due to staffing shortages, time constraints, and clinical care responsibilities. Not one manager or employee interviewed believed that either the HWT or their wellness programs would continue after UML funding and outside facilitation ceased.

At Facility I-3, employee involvement on the HWT is high due to the leadership of the team. They have carefully chosen to continue with the projects that have been successful in the past (e.g., the garden and weight loss) instead of venturing into new ones. They have also received positive support from their Administrator. During an individual interview, when asked about being a part of the HWT, the director of housekeeping cited numerous examples of his perception of the HWT and how the nature of his support for the HWT's projects like Biggest Loser weight loss program or the garden allows him to shed the usual divisions among staff. He cited the team's ability to go beyond workplace stratification and said, "For a minute, you forget the differences, they don't care who you are."

With high participation in wellness activities such as the Biggest Loser and the garden, a consistent theme at Facility I-3 was that having non-supervisory clinical staff in attendance at

wellness activities continues to be a difficult hurdle due to staffing shortages, time constraints, and clinical care responsibilities.

At Facility C-1, there were fewer types of wellness projects than the other PHP facilities. The employee participation rate was low, particularly the clinical staff, due to staffing shortages, time constraints, and clinical care responsibilities.

At Facility C-2, discussion on their first facility-wide baseball game centered on the many benefits of the game, including exercise, communication, and team-building. One of the unit managers articulated her awareness of the benefits of a workplace health promotion program on the entire center:

> "Because the healthier a person is, the better the performance. The person is eating well and they're exercising. Their energy level is up. And they can, their mind, your mind is more clear. You can focus better. And so, yeah, it does create a better atmosphere. Everybody has more energy. Everybody's more positive. They feel good about themselves, so they're going to perform better and everybody, especially if there's a lot of communication too. You feel a lot more comfortable. You don't feel, you know, insecure, inferior. And a lot of those issues rub out when you're around people, you get to know 'em better. You're more comfortable. And so you can work together more as a team and all that other stuff gets resolved, your competitiveness, jealousy, all that stuff starts to dissipate when you're more in unity, more caring for one another, and you have the same focus."

Another unit manager at Facility C-2 expressed the positive impact of the facility's wellness activities on the center as "promoting healthier lifestyles for people." The participation rate of clinical staff was stronger than in the other non-PHP sites due to the support and flexibility of several of the clinical supervisors. When asked about the future of the wellness program, the director of nursing said, "I think it will continue, people have been here for years and they are so enthusiastic. They are a strong team." And one of the employees in the focus group said, "Yes, it will continue for sure. We all want to be healthy and active."

The Administrator of Facility C-3 explained how difficult it is for her to get nursing staff involved in wellness activities:

"Those [ancillary] departments have really had the same staff, day in and day out, for the entire time I've been here, versus the nursing department. And I'm sure there are multiple other variables that also contribute to the nursing department. It's where we have the highest turnover. It helps people feel like they're not just a number at work, that you care about them."

At Facility C-3, a large and ambitious walking proposal was rejected by their Administrator. The Wellness Champion had expended a considerable amount of energy on a proposal to develop a walking path around the facility. It was rejected, said the Administrator, primarily for financial reasons. However, this was a frustrating experience and was cited by the Wellness Champion as a cause for a drop in employee participation in their wellness activities, which has soured the employee's opinion of the facility's services:

"It's business, business, business. And you really don't have the time. The CNAs really don't have the time like they used to, to be able to talk with the residents. In housekeeping and laundry, we try. We may sit for a few minutes, but like I said, it's business as usual, you have things to do."

As in each of the other non-PHP sites and two of the PHP sites, the participation rate of clinical staff was lower due to staffing shortages, time constraints, and clinical care responsibilities.

In all six of the facilities, corporate-sponsored wellness activities (i.e., the 10,000 steps walking program) were enthusiastically embraced by each facility at the outset yet participation dwindled as pedometers broke down and follow-up did not occur.

Table 2. A Comparison of Employee Participation at PHP Intervention and non-PHP Control Sites

	HWT or Planning Comm.	Employee Participation in Planning and Involvement in Wellness Activities
Facility		
I-1	From an initial high to a lower involvement of non-supervisory employees, due to ambitious and unmet goals (i.e., farmers' market).	Activities generated by HWT had moderate to high employee participation in all wellness activities. Corporate-sponsored activities less well-attended.
I-2	From an initial high to a lower involvement of non-supervisory employees, due to lack of decision-making power. Not one employee or manager interviewed believed that the HWT or their wellness activities would continue without UML assistance.	Activities generated by HWT had high participation in walking program, but difficulty getting clinical staff participation in other activities due to staffing shortages, time, and clinical care responsibilities. Corporate-sponsored activities less well-attended.
I-3	Continued high involvement of direct care and	High participation in weight loss program and

	ancillary staff, due to strong leadership of team, careful project planning, and strong administrative support.	garden high participation, but difficult getting clinical staff participation in other activities due to staffing shortages, time, and clinical care responsibilities. Corporate-sponsored activities less well-attended.
C-1	No committee.	Low participation of clinical staff in wellness activities due to staffing shortages, time, and clinical care responsibilities.
C-2	No committee; two enthusiastic wellness activists and strong administrative support.	High participation in all wellness activities, including clinical staff due to supportive and flexible supervisors.
C-3	No non-supervisory employees on wellness committee; had not met in a year, due to lack of leadership.	Low participation of clinical staff in wellness activities due to staffing shortages, time, and clinical care responsibilities.

Table 2 indicates that employee participation in the planning of health and wellness activities was strongest in the intervention sites though the number of non-supervisory employees seemed to diminish from high to low as the project progressed due to ambitious or unmet goals, lack of decision-making power or lack of administrative support. In one of the intervention sites, employee participation in the planning was highest due to strong leadership on the team, careful project planning, and strong administrative support. Non-supervisory clinical employee participation in the planning of health and wellness activities in the control sites was significantly lower at all times except the facility which had two active and involved non-supervisory employees; the other control sites had no active planning committee. There did not seem to be any significant difference if the programs already existed or were introduced by this project. However, participation did drop significantly if the program faced some barrier such as lack of resources or if the employer denied the request to sponsor a new initiative. Employees in both the intervention and control sites have shown interest in wellness activities. Sustained interest was strongest when it was initiated by the employees rather than the employer. However, all sites shared similar employee involvement difficulties, particularly for CNAs, when staffing needs on the units, time constraints, or clinical care responsibilities precluded involvement in wellness activities.

Integration of OSH and HP

Integration of occupational safety and health (OSH) with health promotion (HP) was examined in terms of teams addressing individual health issues such as weight loss and walking (HP) or including such issues as work organization, workplace environment, psychosocial stressors, and ergonomics and musculoskeletal training (OSH). Only the three intervention sites had an integrated analysis of wellness that included OSH as well as HP. Each HWT discussed work organization, psychosocial stressors, ergonomics, and work environment issues and developed projects to address them.

At Facility I-1, the HWT developed a communications log, helped to redesign the employee break room, sponsored ergonomics training for employees, and was successful in getting healthy food in the vending machine.

At Facility I-2, the HWT was instrumental in the purchase of lawn furniture to provide a place to relax in warm weather, were able to get an employee suggestion box, created a method to resolve communications problems on the units, sponsored an ergonomics training for employees, and provided healthy snacks and handmade fruit baskets for staff on the units.

At Facility I-3, when the HWT spearheaded a gardening project, not only was the focus of the garden on healthy eating, the HWT members were also concerned about using the garden as a prototype for developing good proposals, presenting them to management for support and funding, team-building, communications, exercise, stress relief, and a potential for local produce for residents as well as staff. They sponsored ergonomics training for employees. The team also worked to change the workplace environment to have healthy snacks, handmade fruit baskets for staff on the units, low cost healthy food options available for staff in the dining hall. One of the unit managers explained how integration of HP and OSH is practiced on the Safety Committee with help from the HWT. She viewed the Safety Committee as crossing over between patients and staff:

"Well, they're not combined, we usually try to have some of the girls [from HWT] to come to the safety meetings and bring ideas and usually give them a heads up before the meeting Safety is not just bringing ideas for themselves but bringing ideas for the patients as well."

Another manager in the same facility expressed the level of awareness and communications about the integration of OSH with HP:

"Communication is wonderful. If there is a safety hazard with soiled/infected linen, the staff communicates to the director. We have meetings with the CNAs and nurses who let the head housekeeper know and we address the issue."

In the non-PHP control sites, there seemed to be an overall lack of understanding of what an integration of OSH and HP would entail. For instance, at Facility C-2, when the interviewer asked about the integration of health promotion and work organization issues, including other factors that might contribute to an individual's health at the organizational level, one of the unit managers said, "I don't know, I'd have to think about that for a while."

None of the non-PHP sites had any ongoing projects designed to address work organization, psychosocial stressors, ergonomics, or work environment except for the occasional massage, yoga classes, and recreational activities (e.g., softball at Facility C-2).

Table 3. Comparison of the Integration of OSH and HP at PHP Intervention and non-PHP Control Sites

Facility	Work Organization	Psychosocial Stressors	Musculoskeletal and Ergonomics	Work Environment
I-1	Communications log	Redesigned employee break room	Ergonomics training	Healthy food in vending machine
I-2	Employee suggestion box, method to resolve communications problems on units	Picnic tables and lawn furniture	Ergonomics training	Healthy snacks and handmade fruit baskets on the units
I-3	Garden, meetings with CNAs to discuss health and safety concerns	Garden	Ergonomics training	Healthy snacks, handmade fruit baskets on the units, low cost food options

				in dining hall
C-1	--	--	--	Healthy snacks
C-2	--	Annual Health Fair, Softball Team	--	Healthy snacks
C-3	--	--	--	Healthy snacks

Table 3 addresses the integration of OSH and HP and indicates that in each of the PHP sites there was substantial integration and in only one non-PHP site was there any substantive integration. In each of the PHP sites, there was evidence of employees integrating OSH with HP in all areas of work organization, psychosocial stressors, musculoskeletal and ergonomics issues, and work environment with on-going and systemic attempts to address these concerns. In the non-PHP sites, there seemed to be a lack of understanding about how to conduct this kind of integration. In the one non-PHP site in which OSH and HP integration occurred, aside from healthy snacks, integration took the form of sporadic events.

Table 4. A Comparison of Individual Health Initiatives at PHP Intervention and non-PHP Control Sites
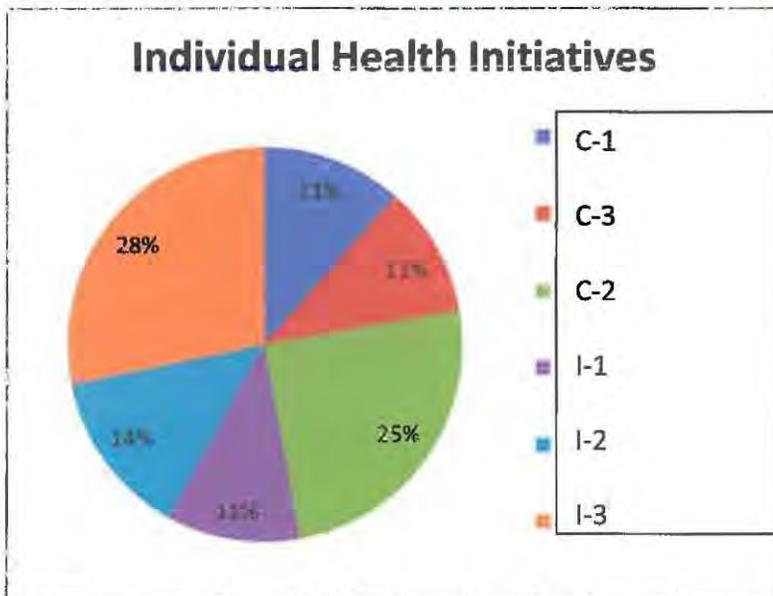
Table 5. A Comparison of Environmental Stress-Related Health and Wellness Activities at PHP Intervention and non-PHP Control Sites
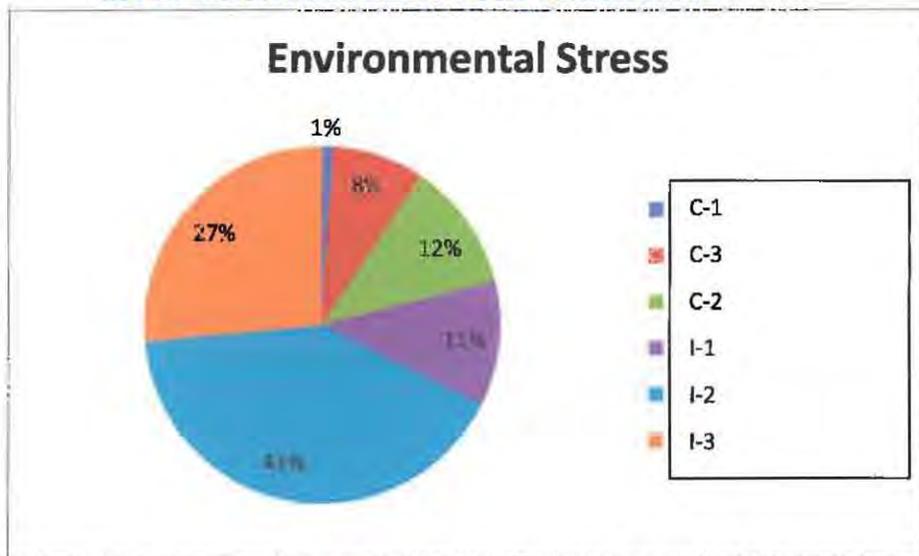
Based on a data analysis application provided by Dr. Robertson, Tables 4 and 5 illustrate the amount of discussion during the interview process that focused on individual health initiatives and environmental stress. These help describe the types of activities that might fall under HP and OSH, though not fully inclusive.   Table 4 indicates that discussions of individual health initiatives were evenly distributed with the exception of Facilities I-3 and C-2. Table 5 indicates that a total of over 50% of all discussions of projects addressing environmental stress occurred in two sites, one PHP and one non-PHP.

Motivators and Challenges

The major themes or variables identified were leadership, presence of the Wellness Champion, resources, staff, stress, time, communications, organizational structure and culture, and team. These variables are discussed by facility and a comparison is made between the PHP and non-PHP sites. At several facilities, several of the motivators were also cited as challenges.

In discussing unanticipated obstacles or opportunities that arose during the research program, a number of factors emerged. These factors are either motivators or challenges or both. Among the

motivators that key informants reported for the success of a PHP and its integration with OSH, administrative support was the most common. Multiple respondents indicated that their leadership has played a vital role in their center's ability to show progress. A number of respondents characterized their administrator's relationship to PHP as highly supportive. In addition, key informants' personal concerns and HWT members' consistency and commitment to the PHP process also served as a positive motivator in a number of centers. Many respondents understood and expressed the importance of employee participation in wellness and sought to ensure that other staff members were able to take part in HP activities within the constraints of their own center's organizational structure and culture.

Leadership

One of the motivators was also cited as a challenge: (1) an active and engaged leadership as evidenced in management support, (2) supervisory support of the health and wellness program, and (3) leadership by the HWT. Administrative support was indicated in a number of ways, including financial support, enabling staff to take time off for meetings and activities, providing space to meet, providing encouragement. The Administrator of Facility I-1 summed this up:

> "I want real, thoughtful projects that if we don't have the money, and this is where we really want, as a team, want to go, to be able to bring it forward and say you know what? The center has this great opportunity, we want to try this, and it's going to cost us this much money, and this is really not within our employee relations funding. But it really is something that we believe is going to be a return on our investment. And how it's going to be a return on investment. Why do you think that? And I think, so I believe, I'm the owner of the purse. But if it goes beyond my purse, I do need to get approvals and sanctions. Would you rather work in a center that is invested in looking out for you as an individual, versus working in a center that does not? I link it back to the vision and mission because our vision statement talks about a very important aspect of the value of employees, and they're the vital link for our success. And part of that statement talks about resources, providing them the best resources and to listen, and listening to the employees. Sometimes we do that well. Sometimes we don't. But we try our best."

In a number of cases, Administrators expressed support for wellness but felt that other demands kept them from providing what was needed.

The Administrator of I-3 expressed her enthusiastic support for the wellness activities:

> "I think if [the Wellness Champion] needs anything, I'm certainly happy to help her with it, you know, and from a manager perspective, getting other managers onboard if she needs more assistance."

The Administrator at Facility C-1 expressed her frustration with the conflicting priorities and myriad

of demands from the corporate office, many of which could have been integrated instead of

individual programs:

> "The challenge is that, in a big company, we have lots of experts in a lot of different disciplines who don't necessarily talk to one another. And so we're not just asked to do Coaching or Living Well or this or that. They all come at the same time. And you're expected to get all of them implemented, and oh, by the way, by next week. And that is really challenging and it can be really overwhelming. I've had this conversation with other administrators. You just feel like, no matter what you do, you're never successful, because there's always so many things coming at you of what you're supposed to do."

Management support is an important motivator which a number of facilities in the study

experienced. At each of the PHP intervention sites and two of the non-PHP control sites (C-1 and C-

3); participants cited management or supervisory support for the activities or for the Wellness

Champion. In one facility in particular (I-1) and in each of the other facilities to a lesser degree,

leadership support for the efforts of the team was somewhat evident, though there was enthusiasm

about the HWT in each of the PHP intervention sites.

At Facility I-1, though there were multiple administrative changes during the course of the

research project, the facility Administrator interviewed was also the campus Administrator and had a

long history with the HWT. He voiced his overwhelming support for the team and the HWT

members echoed this particularly in comparison with the two previous Administrators, whom they

said had given the HWT lukewarm responses to their proposals and activities.

The major effort at Facility I-1, which was to be an ambitious Farmers Market for staff as well as

residents to introduce them to healthy, fresh vegetables and local products, and one which they spent

many months planning, was ultimately canceled by their campus administrator. This was a major

disappointment to the HWT and became a discouragement to many of them. One of the HWT

members said,

> "The Farmer's Market project would have been a very good idea. We had planned all things like
> who will drive, finance, etc. The team did a lot of work but it became a liability. It got a little
> discouraging and frustrating." They have also attempted to sponsor trips for employees as a
> social event and stress relief, but no employees have been interested. The major impact on the
> individual employees was the healthy snacks, the major impact on the facility was an increased
> awareness of wellness, and there did not appear to be any major impact on the corporation."

At Facility I-2, the Administrator expressed how difficult it was for her to support the HWT and

its activities in light of other pressing concerns:

> "Probably not as much as we should, again, because where is it on the list of importance? I think
> it's something that we need to work on."

At Facility I-3, corporate and management support was evidenced by the clear statement of a

dietitian and member of the HWT:

> "And the willingness to allow us to do it, the space to do it, and encouragement to allow people
> to use their break as their time. So that's huge. Especially when you're dealing with aides. It
> was easy to do it because the building and the company supports it. But I think now, with the
> corporate initiative to get a wellness program going, there is more, not pressure per se, but
> there's more encouragement on the part of the corporation to have something going on."

At Facility C-2, one of the unit managers indicated the Administrator's support:

> "The administrator is good at promoting things as well, and forcing things. Even like mental
> wellness, like if you have an issue that you need to deal with, they're very supportive about
> things like that with personal issues involved in workplace."

Some staff spoke of support from their supervisors. During the employee focus group at

Facility C-2, one of the recreation staff members spoke about her direct supervisor's support for her

involvement in a wellness activity: "Our boss is very supportive. She worked our shift when we

wanted to attend the food activity."

At Facility C-3, the Administrator expressed favorable responses toward employee wellness and expressed her enthusiasm yet she did not have a team that could integrate HP with OSH, one of the key research questions in this evaluation. Facility C-3 was unable to tackle wellness in an integrative manner and their activities centered on many fund-raising projects for staff recognition.

Leadership challenges include the type of leadership support for wellness activities. Leadership is a theme that was brought up as both a motivator and a challenge, often in the same facility. Though Administrators often expressed support for wellness, it was not always for the PHP model and employees in each PHP site declared a lack of (1) leadership support, (2) decision-making powers for the team, and (3) support for the team. The non-PHP sites expressed a lack of leadership support for the efforts of individuals.

At Facility I-1, there was an overall perception in 2010 (at the time of the interim evaluation) that the Facility Administrator at that time (since moved on) did not support the HWT or its proposals. Employees perceived the Campus Administrator as lukewarm and the Facility Administrator as somewhat supportive of the Team's initiatives. About three months prior to the final evaluation, he Facility Administrator resigned and the Senior Administrator (who had been in charge of the Campus) was asked to take on administration of the facility as well. This change was heralded by many of the staff interviewed. Until his appointment, no one had been assigned by management to take on health and wellness activities or the HWT. Since the leadership changes occurred, the manager of medical records was named as the Wellness Champion. Even with the changes, members of the HWT expressed disappointment in the lack of participation by other employees, particularly nursing care staff, who often have difficulty getting off the unit to attend a meeting or program. It may be too soon to tell. With three Administrators in the course of the three

years of the research program, the Wellness Champion expressed the lack of support of previous

Administrators:

> "I know [the current Administrator] wants to get some more people that will stay and he's
> looking into ways to do that. Some of the Administrators haven't been responsive to the
> staff's requests and needs."

At Facility I-3, the one of the workers interviewed expressed doubt that management was

interested in the health of anyone but the residents. She felt that employee focused activities would

not be a high priority and that the best people to "sell" a project to management would be those who

are most invested in it.

At one of the non-PHP sites, (C-1), when asked about her ability to prioritize employee wellness,

the Administrator said, "I vacillate and have trouble focusing on wellness."

During the course of this research project, the corporation has introduced a number of corporate-

sponsored programs focusing on employee wellness. It was evident that, in the past year, the

corporate culture had embraced employee health and wellness with the addition of wellness

champions across all study facilities (and perhaps others as well), the introduction of a corporate-

sponsored employee walking program (which had begun in the three intervention sites earlier), and

more corporate-sponsored wellness materials like the healthy recipe cards. Wellness Champions at

each of the sites have gotten support in terms of materials and supplies (healthy nutrition recipe

cards, pedometers, newsletters, and bulletin boards). Overall, each of the PHP and non-PHP sites

had varying degrees of general acceptance of employee wellness as part of their overall

organizational culture. At one site (C-3), one of the Safety Committee members said that the

corporation had a "moral compass pointed in the right direction."

To assess corporate support of the projects, the researchers asked administrators, managers, and

non-supervisory employees were asked how the company prioritizes wellness amid all of the other

competing corporate initiatives including Culture Change, Management Training/Coaching Supervision, Healthy Lifestyle, and the Safe Resident Handling Program.

Though support from corporate management was often indicated in the healthy recipe cards or the walking program, there appeared to be little integration or follow-up at the local level. For example, at the C-3 facility, the first site visited by the research team for the final evaluation, the researchers were introduced to this program when the Wellness Champion came to the evaluation interview with a lapel pin with the imprint "Living Well." When asked what that meant, he explained that the corporate office had launched a new program for which all employees were given pedometers and asked to walk 10,000 steps a day in 28 days as a challenge. He called it a "big hit" and assumed it would lead to more involvement in their wellness committee that had not met in over a year. In numerous interviews at each subsequent center, it became evident that this effort was not integrated into the varied local efforts and that many of the pedometers were quickly broken, replacements were difficult to procure, and once the 28-day competition ended, nothing was communicated on this corporate-sponsored employee wellness effort. When asked about corporate management support, one administrator at a non-PHP site (C-3) said, "Employee health and wellness doesn't quite trump clinical or financial concerns." One worker at a non-PHP site said, "If management supports it, it's death."

In summary, a key success factor for an OSH or HP project is the presence of engaged and active leadership both from administration and the HWT. When support and leadership was present, it seemed to be an indicator of the growing recognition that a healthier staff and resident population also may mean higher morale and lower health/insurance costs. When support and leadership was not present, decision-makers talked about being faced with other pressures, needing to make decisions in favor of other more urgent projects and programs.

Presence of Wellness Champion

At the start of the present evaluation, not all facilities had someone appointed to be their Wellness Champion; however, by the end of the grant period, all of the PHP and non-PHP facilities had selected and appointed their Wellness Champion, as required under the corporate-sponsored Living Well program. In each case, the Administrator chose the person who had been the key liaison with UML. One Wellness Champion was appointed early in the research project at Facility I-3. Wellness Champions are not full-time positions; in fact, all of the Wellness Champions already have full-time jobs. Wellness activities are additional tasks for which they are responsible. All of the Wellness Champions are seen by key informants as the "go to" person for employee wellness. In the PHP facilities, the Wellness Champions also either sat on or led the HWT. In the non-PHP facilities, the Wellness Champions each had direct and regular communication with their Administrators.

Many of the key informants cited the Wellness Champion as the leader of the wellness efforts and the importance of having someone to act as a motivational force behind the team's ideas. The Wellness Champion in I-1 articulated it this way: "As the Wellness Champion, I know people come to me with their problems."

The Wellness Champion in Facility I-3 explained that, in her short time employed there (one and one-half years), she has been the motivating force. Another member had been the motivational force before her. The Wellness Champion said:

> "We have had two Biggest Loser programs since I've been here and they both have been very, very successful, probably the best thing. We also have had two gardens here as well and it was done in prior year as well and everybody loves going out there, helping set up. Last year what we did with the vegetable garden was every time we were able to pick we would put them on plates and put them on the different floors and say take whatever. You know, it wasn't as big as I was hoping it would be, but it still turned out that we did get some produce and were able to hand those out. We also did a better menu, a healthier menu with the kitchen, which is a huge success."

Many managers and non-supervisory staff at Facility I-3 spoke in favorable terms about their Wellness Champion. Her work was cited as excellent by both the Administrator and the HWT. Conversely, at Facility C-1, which was the last of these centers to appoint a Wellness Champion (i.e., six months prior to the interviews); most of the staff interviewed did not know that the Wellness Champion had been appointed. As a graduate of the UML Work Environment Department, he understood the integration of HP and OSH and the PHP model yet his split role as Wellness Champion along with admissions and marketing responsibilities meant that he had not participated in any of the regional meetings for Wellness Champions nor been involved in any wellness activities.

In summary, by the end of the research project, all six facilities appointed a Wellness Champion. In the intervention facilities all of the champions were highly visible and was seen as the "go to" person for employee wellness. In the control facilities, the Wellness Champion did not have the same level of recognition nor the same abilities to motivate workers.

Resources
Resource allocation refers both to financial allocations and in-house resources. In each of the PHP and non-PHP facilities, there is no allocation in the center's budget for employee wellness. Most of the facilities engaged in regular fund-raising for their programs and many of the key informants expressed frustration at the lack of funds for their programs. Much of the attention to fund-raising seemed to take away from attention that would have been better spent on planning activities. At one of the PHP sites, Facility I-2, much of their work had focused on fund-raising in the past.

At two of the PHP facilities, large periods of time during HWT meetings were spent planning activities that were later scuttled by management. The Farmers' Market was denied based on insurance concerns. It was not a monetary issue; the proposal was designed to bring in money to

support future wellness programs. The walking path was denied based on budgetary constraints.

Using existing in-house resources was a motivator for the facilities able to tap into the talents of staff

members. For instance, at Facility I-1, one of the nurses offered yoga classes as part of their health

and wellness program. At Facility I-3, the dietitian offered many in-house programs and services

including a weight loss program, potlucks, and healthy recipes.

At Facility I-2, there has been verbal support for the team expressed by the Administrator and

other managers, but members of the HWT feel that support is not backed up by resources:

> "Well, like the raffle that we had to get the furniture, I went to [the administrator] and I said can you advance me a hundred dollars so I can get the raffle tickets? And she just ignored me. It was, like, I wasn't even talking to her. So I said, forget it. I'll just use my own funds, you know? And that's basically what I did."

The non-PHP facilities did not indicate as much in-house except for the dietitian at facility C-

2 who coordinated a health fair for employees, but it was only once a year. The Administrator

explained:

> "My dietitian spearheaded this a couple years ago and we've done it every year, one day where she sets up a booth with all kinds of health and wellness literature and different types of foods and fruits and things like that, and the staff partakes in that as well. But that's just like a one-day blitz."

Some of the challenges regarding resources include the lack of financial allocations available

to the teams. While the corporation included employee wellness in their priorities, little or no

financial resources were available for the HWTs. A major disappointment was the management

decision to deny a walking path proposal at two of the sites (C-2 and I-2), on which the HWT and

their Wellness Champion had spent considerable time planning the route and associated budgetary

information. The Wellness Champion at Facility C-2 said:

> "It took time. I wrote it along with my job. It was frustrating, but I understand because of the economy and budget constraints the management did not approve it."

The lack of approval for the walking path proposal was a disappointment not only to the

Wellness Champion but to the morale of the entire HWT, which had dwindled to 4-5 members,

partly due to frustration with the lack of progress as expressed by a member of the HWT:

> "I said this yesterday myself, that in the beginning, I was all hyped because I figured, oh, I might be doing something for the company, because I'm brand-new. You know, things might go well. But then after three years, it's just very frustrating."

In addition to the lack of a budget allocation for the HWTs, the need for almost constant

fund-raising for programs, the corporation has recently decided to change health care plans in one of

the states and both employees and the Administrator brought up the diminished health care coverage

and increased costs as a barrier. One of the employees at Facility C-2 said:

> "Before, we had Blue Cross who used to do bone density, blood pressure screening. The corporate office changed from Blue Cross/Blue Shield to CIGNA. It's awful, doesn't cover basic stuff. Lots of people are unhappy with the huge deductibles and huge co-pay. Even with routine physicals and mammograms, we get bills."

Another employee at Facility C-2 concurred and cited his dire economic consequences,

> "You need to stay healthier and happy and you need insurance. I can't pay my bills if I have this CIGNA insurance. Blue Cross was good. They sent stuff weekly about health issues."

The Wellness Champion at Facility I-1 expressed her frustration with the lack of resources,

particularly with a corporate-sponsored walking program. A number of sites expressed concerns

about the faulty pedometers and cited that as the reason participation rates dropped severely for this

activity:

> "Last month, through the wellness, you know, the Genesis wellness program, we were supposed to have a walking club. And we were supposed to have a log in, everybody received a pedometer. The frustrating part was the majority of the pedometers broke. And the whole thing fell apart. And [the Administrator's] frustration is that if [the company] wants us to have a program like this, they have to give us the right tools and we did not have the right tools. So that fell apart. But when it began, people were really excited about this. They were supposed to log their progress for the month and then… but they couldn't log their progress if they didn't have the tools they needed. There was no follow-up because they didn't have the pedometers and people were so frustrated. I emailed the woman who is

head of the [corporate] program and she said 'we're having this problem across the board at all the facilities and we can't get any more pedometers.'"

In summary, although wellness is a stated goal for both the PHP and non-PHP sites, no funds were allocated in any of the facilities' budgets for employee wellness. Without adequate resources, a number of the projects and especially the higher cost projects simply could not be implemented. Many employee hours were spent in fundraising – time that might have been better spent on employee health and wellness activities. A number of sites indicated that the lack of quality pedometers was the reason that the corporate-sponsored walking program did not succeed. One positive trend that seemed to be emerging from necessity is to ask for in-house staff to take on a wellness project such as teaching a yoga class, starting a weight loss program, or assisting with healthy nutrition suggestions.

Staff

Another resource that is as central to either the motivation or the challenges of a wellness program is the staff committed to becoming involved in the planning and participation of activities of the health and wellness program. Support from staff, growth of or lack of staff awareness, and staff buy-in are significant aspects of this theme.

Assessing the effects of the wellness program on the awareness of individual employees was difficult to ascertain across the board with such a small sample, but the employee focus groups, which were a cross-section of the employee population on a given shift, indicated that the effects on employees was more apparent in the I sites than in the C sites. Awareness of the wellness activities or the HWT was uneven. In some facilities there was little or no knowledge on the part of uninvolved employees of wellness, who participated, and which activities came from the HWT and which came from the corporation, particularly for those employees on 2nd or 3rd shifts. Some staff were absolutely unaware that the team had any part of the wellness activities in their center. For

instance, in a PHP site, Facility I-2, most employees on the first shift recognized the team but the evening and night shift employees expressed no awareness whatsoever of the team or their activities. In addition, no one knew who the Wellness Champion was and the Administrator concurred: "Not enough people are aware. They think it's a part of employee recognition."

Similar to employee awareness, staff buy-in or employee commitment to wellness was uneven. In centers where the HWT included members who had access to many of the units and departments (i.e., Facility I-1), there was increased employee commitment evidenced by the interviews with staff.

Some of the challenges that staff face include staffing, staff awareness, staff support of team and its activities, staff buy-in, staff participation, and staff stress. In Facility I-2, the DON expressed the difficulty getting people from 2nd and 3rd shifts to participate in activities: "I think you see a lot of the same people participating, the day shift people."

Most of those interviewed in Facility C-2 expressed that the wellness team activities at have been very effective. One of the unit managers said:

"It has helped in creating more cohesive team. Outside work activities bring them together."

The Wellness Champion for Facility C-2 cited the broad-based awareness of staff regarding wellness issues:

"People are thinking about what they are eating. The snack machine has better options. People have lost weight and inches. The Biggest Loser was a motivator. It improved communication. People whom we normally don't talk to. Everyone is busy. It's nice to get out and know people."

And one employee from the focus group at Facility C-2 said, "I've lost 20 pounds and cut down on junk snacks." And another expressed how it had an effect on the whole center: "If a person is eating well and healthy, they can focus better. It feels like more energy, positive, and you can perform [your job] better."

Of the 19 employees who attended each of the focus groups at Facility C-2, all were aware of the wellness committee and a number of them spoke out on wellness activities. They posited the connection between the HWT and morale. When wellness activities were fun, morale improved. Working as a team, a number of employees concurred, is better than working alone.

In almost all of the facilities, there was little recognition on the part of the employees of the team and its members. At the non-PHP control facilities, no employees in the EFG's could name someone on the wellness team whereas at the PHP intervention sites, even the most uninvolved employees could name at least one person on the HWT.

At Facility C-3, management perceptions differed from employees when asked about the current activities of the HWT. For instance, the Director of Facilities Management expressed much pride in the new corporate-sponsored walking program and said that he had talked with many employees who were very enthusiastic. However, employees did not show the same level of enthusiasm. Most of them expressed concern that the pedometers did not work. When employees or managers were asked about the wellness program, only one charge nurse mentioned stress management as an important feature of a wellness program, most of them were not aware of any wellness programs and did not participate in them.

Similar to employee awareness, employee commitment to wellness was uneven. In centers where the HWT included members who had access to many of the units and departments as in Facility I-1, a PHP site, there was increased employee commitment as evidenced by the interviews with staff.

Employee participation can be a serious challenge (Linnan *et al.*, 2001). In each of the facilities, staff brought up the issue of short staffing, time constraints, and clinical responsibilities as primary causes of the lack of employee participation in wellness activities. In one of the non-PHP

control sites, Facility C-1, the director of nursing said that the CNAs are not allowed to leave their units for wellness activities because "they have to count the narcotics" each time they leave and that having more activities on the units would help facilitate their participation.

An issue endemic to all facilities in the study was the problem of short-staffing of clinical areas of the centers. At Facility C-1, the DON discussed the obstacle of getting direct care nursing staff off the floor to attend meetings or programs.

In summary, staff awareness of the planning process and participation in wellness activities was uneven across both PHP and non-PHP sites. In addition to awareness, involvement of staff in wellness planning and activities suffered and, according employee responses across all of the sites, the issue of short staffing that was cited as the primary cause for low participation in HWT, wellness planning, and wellness activities.

Psychosocial Stress

The researchers assessed the relative stress that employees face as part of their jobs. Stress not only was derived from the actual job as many of the employees in this industry are working at two or three jobs at low wages, with concomitant family, housing, and financial difficulties. However, much of the stress reported was due to the work itself. At Facility I-2, both employees and managers agreed that the stress on employees has increased in the past three years. A new unit, the Transitional Care Unit (TCU), has increased workloads and documentation needs has caused stress among the employees. One of the HWT members spoke about the new TCU, "The center has gotten more stressful. Work is more demanding because of the TCU."

At Facility C-1, the Director of Nursing indicated that staff were more stressed and tense now than ever before. The food services director at C-1 indicated that gang members and church members all work together; making it a "tough crowd in my kitchen" that often adds stress to the workday. At Facility C-1, stress was described as:

"More and more work and less and less staff. Less and less time to be able to spend with residents. That's the biggest thing. But especially nurses because you've got 10 hours' work, you're trying to squeeze it in eight hours, and that, they're making you take your break. They're making you take a lunch whether you're doing it or not. You do it --"

A member of the Employee Focus Group at Facility C-1 articulated her understanding of the psychosocial stress experienced on her job:

"I think it kind of stresses everybody out, you know what I mean? It does. It works, it does its job on you after a while, you know what I mean? That's why you have to take the break and get away from the floor because if you don't, you blow off a gasket?

The researchers probed the issue of stress with another employee at Facility C-1 who articulated her concerns about stress due to the corporate policy of no overtime for non-direct care staff, even if the work exceeds the hours paid:

"The stress is significant. Especially when you've got paperwork and you know what's going to happen. Your paperwork's going in late because you can't possibly do that high a volume and eventually they're going to say well, Yeah, there's no room, no leniency. They want you out. And if you're not out, they have weekly calls here and they have to explain to corporate why they were not out on time."

Most of the interviewees at Facility C-2, mentioned stress as a factor that needs to be addressed. A member of their wellness committee said, "Stress is a big problem you can hear around." One of the unit managers suggested that though stress seems inevitable now, there may be solutions in the future: "It's a stressful job. In the future, there may be something that averts stress. People need to know where to direct stress. It may be education, because it's a job, so people need to know."

The employee focus group at Facility C-3 all agreed that stress was everywhere in the center with staff members from every shift, not because of lack of teamwork or support but because of a heavy workload and short staffing. One of the CNAs who had been working there for 15 years

suggested a way to relieve stress would be to resume the morning stretching activity during morning meeting "stand up" time and said she would bring this idea to the Administrator.

An HWT member at I-3 explained that being involved in the Biggest Loser weight loss program was actually a stress reliever:

> "You know, because when you're in your stress you explode more. They will figure it out later. We got to go to the Biggest Loser (to relieve our stress)."

In summary, employees stated that short staffing was also linked to higher levels of stress. Again, this was echoed consistently across all of the sites. A few staff spoke about opportunities to reduce stress and linked those opportunities to more education about health programs, to the coordination that comes naturally from a team approach.

Time

From the interviews, the researchers noted that there were specific themes related to time including time for staff to attend meetings, the complex and systems issue of staffing, general time issues, more nontraditional uses of time, and having a defined ending point for programs and activities. Not only is time an almost universal challenge, that is, time for meetings, time to plan events, and time to attend programs, but it also is seen as an added pressure leading to stress.

At each facility, the key informants expressed frustration that the lack of participation had to do with staff unable to take the time for activities or meetings of the wellness team. A number of key informants suggested that schedules might be able to be changed to allow staff to attend wellness activities or meetings. The Wellness Champion at Facility I-3 had an innovative suggestion:

> "I think that they could assign a lighter assignment for that person that day and give them that time to come down. It's only an hour meeting from 2:00 to 3:00, and to have them come down and they could still go back up on the floor at 3:00 and do their books from 3:00 to 3:15. But if they could pull off one or two people from their assignment, it'd make it a little bit easier for them to attend."

The HWT at Facility I-3 has a fairly large and robust team of approximately 5-7 members but they all agreed that more staff would attend if the meetings were shorter. They thought shorter meetings of 30 minutes for the team would get more direct care staff to be involved since it is difficult for staff to commit to one hour team meetings.

Having most of the activities and the meetings occurring on first shift has meant that staff on second and third shifts are rarely involved except when they work a different shift. The Wellness Champion at Facility C-2 said that they were experimenting with activities on off-shifts: "Work duties and time seem to be our biggest obstacles so we decided to do different things at different shifts."

A change that could help in overcoming the challenge of time, which was suggested by one of the key informants at a PHP site as well as one of the key UML researchers, was to treat HWT meetings and activities on the daily schedule similar to the way staff training is treated so that staff members who were interested in participating on the team or in a wellness activity could be relieved of his or her duties with another staff member without worrying about leaving residents without sufficient caregivers.

In summary, in all of the intervention and control sites, time was unanimously viewed as a barrier (e.g., lack of time for meetings, etc.) and also as an added pressure leading to psychosocial stress and other health-related concerns. At each facility, staff linked the lack of participation in wellness programs to the inability of staff to take the time for wellness activities. In addition, only one shift (first) was able to participate in the planning meetings or most of the activities. Innovative ideas such as a lighter assignment or scheduling time for meetings and activities could relieve much of the current pressures of time.

Communications

An assessment of communications (1) between managers and employees, (2) among employees, and (3) between the HWT and management was conducted. In order to assess these variables, researchers asked several questions about communication and how it can be improved. In Facility I-1, the Administrator was proud of his accomplishments in highlighting the need for good communications between the HWT and the rest of the facility:

> "Well, that's why we did the bulletin board. That's why we're posting communication meetings, because that wasn't happening. And so that was an area of concern or weakness. That's another focus point. How do we engage more people involved in the process? You've got to communicate your successes. The more transparent you are, the better the successes."

One of the members of the HWT in Facility I-1 expressed the importance of being able to listen to employees in order to be a successful program: "Listening to people, being good listeners, and being patient. Communication is a big part we still have to work on, but communicating with each other is vital."

The Wellness Champion at Facility I-3 exemplified the role of communicator and has utilized several methods of communicating with staff including meetings with the Administrator, reporting two to three times a week during morning meeting where unit managers then discuss with their own employees, flyers and posters in the break room, and discussions with individual employees.

Communications can also be challenging. An employee in Facility I-1 who attended one of the focus groups was upset about the lack of communications in their facility and was concerned that messages are passed down through the building and the content gets lost. She said: "Communication, that's a big problem around here. By the time it gets from downstairs to upstairs, it's totally different."

In Facility C-3, another Administrator echoed this problem and explained that they now include more information in writing in employee paychecks and meet with teams on their own units to improve communications between managers and employees:

> "We do a lot of paper communications in paychecks and we no longer meet as a management team. We meet on each unit with all of the staff that work on that unit, from every department."

At Facility I-2, both the employees and managers cited the lack of communication as one of the largest stressors and most critical barrier to successful wellness programs in the center. Communication between employees and management, employees on different shifts, or between the employees and the HWT was articulated in almost every interview. For instance, the Administrator concurred with the lack of communication between the HWT and management:

> "The team [HWT] and management communicate very little. Yuan [one of the UML facilitators] sends the minutes to me. What happens in the room stays in the room. I get most information from [the Wellness Champion]."

The maintenance director at C-2 said, "Communication is not a problem between the management and the team [HWT], but it is between the team and the rest of the facility. The team lacks communication with the rest of the building." The Wellness Champion at C-2 concurred: "There is good rapport between the management and the team."

On the other hand, lack of communication between employees and managers manifested itself in Facility C-1. The employees in the focus group did not know about any of the wellness activities that had been extolled at length by the Administrator and managers. At Facility C-2, both employees and managers indicated that communications could be improved. The Administrator said:

> "There is not enough communication in the building with so many employees. There are regular meetings where things get mentioned. Even with all the emails, postings, newsletter, even with all these there will be people saying they are not aware."

One of the unit managers appreciated the effort that the HWT placed on communications:

"They come up and tell me, 'post it by the time clock in the break room.' They do a great job."

The Wellness Champion summed up the good communications as:

"We've had articles about wellness in the newsletters the past six months and people really are interested. Morning meeting is pretty good; we discuss all important things. There is pretty good communications."

One of the CNAs at Facility C-2 expressed her frustration with not hearing about events first-hand:

"Communication is needed. Getting things second handed, instead of hearing from others, they can announce overhead.

In summary, communication between management and the HWT/planners as well as between the HWT/planners and the organization was uneven across both PHP and non-PHP facilities. Where lack of communication existed, it was often cited as the biggest stressor for staff. However, there appeared to be a trend towards better communication in organizations where there was focused attention on work organization issues. In facilities where closed door management meetings were opened to staff and/or where the Wellness Champion utilized several methods of communication (e.g., memos, flyers, announcements during meetings, etc.) communication was viewed as a smaller problem or not a problem at all. There appeared to be a significant difference between intervention and control sites in terms of communications.

Organizational Structure and Culture

Many of the Administrators discussed wellness as part of their everyday work and their wellness champions and teams as part of their organizational structure. Now that Wellness Champions are seen by [the company] as part of the organizational structure, there could be some unintended consequences for the future. For instance, in Facility I-3, the HWT relies almost solely on the Wellness Champion and, without her work, the members said there would be no wellness

programs in their facility. The Administrator in Facility I-1 raised questions about the role and

function organizationally of the Wellness Champion, echoing others' concerns:

> "Should the wellness champion alternate among members of the committee, over a period of time? Or having a wellness champion and then maybe a co-leader, so that there is some rotation in that role so that people know that they have the opportunity to become the wellness champion over time.

At Facility I-1, the Administrator, who had only been at the facility for three months (though

he has been the Senior Administrator for many years), explained that one of the HWT's strengths

was in their ability to communicate effectively across the entire facility. He likened wellness to a

continuum in which communication played an essential role:

> "So wellness could be a wide spectrum. It could be not having the right supply. People could ask and say what does that really mean? What does that have to do with wellness? Well, it has to do a lot if you don't have the resources to accomplish what you set out to do because your morale goes down, your self-esteem may be impacted. Your whole demeanor may change, which typically connects to systems issues, not employee issues. And so again, kind of makes that, that's a continuum, a cycle, I think. And so, they have been very successful in their communication level."

The Administrator at Facility C-2, a non-PHP site expressed her own understanding of

wellness being part of the organizational culture of a health care facility:

> "It's just innate in us. We all want to be healthy. Even looking at patients makes you think: if we can't see health and wellness, we can't be good role models."

At one of the PHP Intervention sites, the Wellness Champion expressed the ways in which health

and wellness has become a part of their culture at her facility (I-3):

> "I would say with some of us it is. We also will be doing Healthy Living through corporate; they're trying to encourage all of us to do that in all our centers. And that was part of the pedometers as well."

Many of the direct care nursing staff are unable to attend meetings and, in Facility C-3, the

management representatives have been experimenting with more face-to-face contact with staff by

holding their meetings on the units. At Facility I-2, the employees expressed their frustration at the lack of organizational difficulties in their center.

One aspect of organizational culture is the way in which employees watch out for each other, as in 'got your back' amid the difficulty of the work. One of the employees at Facility C-2 explained: "Everyone gets along well. CNA's don't get off easy, but we cover for each other."

In summary, a few of the sites described health and wellness as an inherent part of the organizational structure and culture and value of working with a health care facility. In facilities where that might not be the case, the Wellness Champion became the sole organizer for the wellness program. A few questioned whether having a single champion might, over time limit participation. Some suggested rotating the role to ensure that more people are reached within each facility.

Team

Team refers to consistent team membership, program ownership or staff buy-in, empowerment, skill-building, setting appropriate goals, and respect. Most of the HWT members who participated in the evaluations were support or ancillary staff, and not the direct care staff for whom the PHP project was primarily intended. When the CNAs and other direct care staff were present, it was not without difficulty either because of pressures of their own work or because of pressures from other members of their unit.

An analysis of the HWT in the PHP sites and the wellness committees in the non-PHP sites indicated a number of themes including (1) communication between the team and the management and employees, (2) participation on the team, and (3) sustainability of the team. As part of the research project, the UML facilitators visited the PHP centers every two weeks to help build and support the HWTs, but the HWT members themselves were encouraged to run the meetings, plan the activities, and create and present proposals to their management. The UML staff supported the

teams with research and ideas but were clear in that they did not do the work of the committee. In the non-PHP control sites, there was no such support from UML.

Non-supervisory employee participation was lacking in all of the PHP teams. New or revised approaches are needed to overcome obstacles and allow for more sustainability include (1) more corporate support at the center level in terms of granting people on the HWT more time to plan and implement programs, (2) a different scheduling practice to allow direct care nursing staff attend HWT and other wellness planning meetings so that their work is covered on the unit, and (3) more cross-pollination of wellness programs through a more integrated communication system for Wellness Champions.

The Administrator of Facility I-1 was emphatic in his support for the participation of staff, the empowerment of the HWT, and the opportunity for more health and wellness programs in his building. He also stressed the importance of management supporting the team even in an environment of heavy management turnover:

> "There's always something going on in the center on a monthly basis that there's a, I call it esprit de corps. And it's there. You know it's there. Sometimes you need to be able to tap it. I think it is incumbent upon leadership to recognize it and to promote it. Because if you have, and this goes back to the inconsistency of leaders, if you have sporadic leadership, and not everyone on the same page, your wellness team won't be as effective and you tend to lose ground. I think the building has lost some ground because of that reason, in terms of the volume of people that we would expect to be after three years. You would expect it to be a larger group of participants. But they do participate. You have 10 people that are always there at a meeting, and those are the 10 people who participate. These are people that will come out of the woodwork and say I'll do that. So there's a lot of great opportunity there."

After many months of the HWT at Facility I-1 waiting for a decision by the Campus Administrator, and then finally learning that the proposal was rejected, the HWT members became quite frustrated and their participation waned showing the cyclical nature of team participation and the problems with taking on ambitious projects.

A manager at Facility I-2 who was deeply involved in the HWT discussed her frustration with the lack of autonomy and administrative support for the HWT:

"I'd like to see them with the autonomy to run that committee, because they've had three years of support that should show them how, what ideas people have, how they go about, the questions that they ask, how would you handle this, and how do you make this happen? So they've had that support. I would think that if they [the HWT] were even given maybe a 15 minute time with [the Administrator] on a twice a month basis."

At Facility I-2, participation of non-supervisory employees on the HWT has been a difficult issue, particularly for the CNAs, who are rarely able to leave the floor. The Wellness Champion explained how a very small HWT develops new activities through surveying the staff and writing proposals:

"We really try. We're a very small team in this building. We only have five people on our team. But we really try and include everybody in what we do. We send out surveys when we want to do something or we're thinking of doing something. We did that with the food for the vending machines, what would people like to see. We got a list of things that were available and put it out for people to check off what they would like. We tallied up the most popular things and gave it to the person who deals with the vending machine companies. So we do try and incorporate everything into the system."

The Wellness Champion at Facility I-2 catalogued many of the ways in which the UML facilitators assisted their HWT. She began her statement in response to a probe about the:

"We actually had some people from UMass come into all the different departments. It was made mandatory by management. So just about everybody in the building attended for their particular, they had certain things for the business office on how to sit and how your hands should be positioned and so forth, and with housekeeping, how bending is stooping with your knees and, you know, keeping your back. And they did a lot of the stuff like that. We also, in that same timeframe, had some dieticians come out from UMass Lowell to do healthy eating and calorie counting and so forth. And when we did The Biggest Loser, we published recipes every week for the people. We actually put 'em out for everybody in front of the break room so that they could have, we did breakfast, lunch, dinner, and a snack every week, so.

Empowerment and skill-building are an integral part of many of the HWT responses to their work as part of a team. Recognition and respect for the team has been a large part of the discussions

that the teams have had when evaluating their own work. At Facility I-3, one of the members of the team said:

> "I think that the team here works very closely together, and so, they've probably had a lot of discussions or comments regarding what we do. I mean even the DON, the head nurse here, joined us a couple times."

For a small team, the HWT at Facility I-3 has created a number of impressive programs but it appears that the team is repeating the same activities that have worked over the past three years (i.e., weight loss and the garden) instead of introducing new ones.

One of the concerns the HWT at Facility I-3 has is that their Administrator indicated that she would like to combine and shorten the HWT meetings to thirty minutes twice a month. That would put a damper on the team commitment and functioning.

None of the non-PHP sites had a functioning wellness committee, though each of these facilities had supported such committees before the start of the research project. Though Facility C-2 had no official team or wellness committee at the center, there were three employees from different departments involved in planning wellness activities for the center. One of the unit managers recognized them as: "We don't have a formal committee, but I know who is involved. They are doing a good job." Even though the three employees were recognized as doing the bulk of the work, one of the unit managers complained: "It's the same people who do all these wellness activities. There is no committee."

The non-PHP sites had sporadic, if any, team meetings of their health and wellness committees. In Facility C-3, the team had not met in over a year. When asked about team participation, the Wellness Champion expressed the real difficulties getting people involved because of time and frustrations. They said that though the management team is generally positive, their suggestions are rarely acknowledged and people have stopped writing suggestions to the suggestion

box because their ideas were not followed up. Time and support were expressed as the two big barriers to the wellness activities.

In summary, one of the fundamental questions of the research project centers on the activation of a non-supervisory team planning and implementing health and wellness activities. In the PHP sites, most of the HWT members came from support or ancillary staff rather than non-supervisory or direct care staff (the target audience for this project.) When the teams had more support from non-supervisory clinical staff, their projects reflected more of the significant health concerns of the facility. The HWT and the champions need to compensate for this through better communications and involvement of direct care staff in activities. In the PHP sites, teams that created concrete programs had more visibility and those that addressed staff concerns had better participation. The teams on the PHP sites did meet on a regular basis while the non-PHP sites had only sporadic, if any, meetings of their wellness activists.

Table 6. Factors[20] that Motivate or Challenge Success by in PHP Intervention Sites and non-PHP Control Sites

	Leadership	Wellness Champion	Resources	Staff	Stress	Time	Communi-cation	Organi-zational	Team
Facility									
I-1	M	M	M/C	M/C	C	C	M/C	M/C	M/C
I-2	C	M	M/C	M/C	C	C	C	M	C
I-3	M	M	M/C	M/C	M/C	C	M	M	M/C
C-1	M	M	C	M/C	C	C	M/C	M	C
C-2	M/C	M	M/C	M/C	C	C	C	M	C
C-3	M	M	C	M/C	C	C	M	M/C	C

Table 6 summarizes each of the variables that either motivate or challenge the success of a project by facility. Some of these variables are solely motivators, some are solely challenges, and some are both motivators and challenges in the same facility. Though it is clear that some of the

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[20] The factors identified by the researchers as motivators and challenges included leadership, the presence of a wellness champion, resources, staff, stress, time, communications, organizational structure and culture, team, and future sustainability. These factors were experienced by key informants at each of the facilities as either motivators (M), challenges (C), or both and are noted in Table 3 as such.

factors were challenges for all facilities (e.g., stress and time), other factors were distinctly

motivational for all of the facilities (e.g., Wellness Champion) and another was a mixture of both for

all of the facilities (e.g., staff). When comparing PHP with non-PHP sites, it is interesting to note

that the PHP sites had a higher number of motivators than the non-PHP sites. The PHP site with the

lowest number of motivators (N=7) was still higher than the non-PHP site with the highest number

of motivators (N=5).

Conclusions

Each of the facilities showed a significant level of health and wellness activity, with a higher

proportion of activities in the PHP sites. Wellness activities were moderate to high in the PHP sites

and low in most of the non-PHP sites (with the exception of Facility C-2). Employee participation in

the planning of wellness projects was highest in the PHP sites at the start of the research project

three years ago and has diminished since, particularly with respect to the involvement of non-

supervisory clinical employees and unable to be measured in the non-PHP sites due to the lack of

functioning wellness committees. Integration of HP and OSH occurred most readily in the PHP sites

in all areas of work organization, psychosocial stressors, musculoskeletal and ergonomics, and work

environment whereas the non-PHP sites only had integration of a sporadic and minimal nature in

psychosocial stressors and work environment.

The key factors for successful wellness programs integrating employee participation and an

integration of HP and OSH are shown in Table 7 and included (1) the presence of active and strong

leadership both from the administration and the HWT, (2) the consistency of a Wellness Champion

to act as a liaison between the employees and the administration and has adequate time and support

to follow through with programs, (3) adequate funding and resources for employee wellness to

prioritize employee health and so that staff do not have to engage in lengthy fund-raising activities,

(4) employee awareness and commitment to the planning of and wellness activities as a priority for staff severely suffered in all of the facilities due to concerns about shortages and responsibilities in clinical care, (5) attention to the effects of stress and the attendant relief from stress that wellness activities which highlight OSH, (6) an approach to time and innovative ways to handle universal issues of lack of time for planning and attending wellness events and activities, (7) effective and consistent communications between administration and employees, (8) creating an organizational culture and structure in which employee wellness is an inherent part of the facility, and (9) wellness planning teams that had consistent and strong commitment from staff in all departments including clinical care.

Table 7. Nine Key Factors for Successful Wellness Programs with Employee Participation and Integration of HP and OSH

Key Factor	Description
1. Leadership	Presence of active and strong leadership both from the administration and the HWT.
2. Wellness Champion	Consistency of a Wellness Champion to act as a liaison between the employees and the administration.
3. Resources	Adequate funding and resources for employee wellness to prioritize employee health and so that staff do not have to engage in lengthy fund-raising activities.
4. Staff	Employee awareness and commitment to the participation of employees in the planning of and involvement in wellness activities.
5. Stress	Attention to the effects of stress and activities which focus on workplace organization and the work environment.
6. Time	An approach to time and innovative ways to handle universal issues of lack of time for planning and attending wellness events and activities.
7. Organizational Structure and Culture	Creating an organizational culture and structure in which employee wellness is an inherent part of the facility.
8. Communications	Effective and consistent communications between administration and employees,
9. Team	Wellness planning teams with consistent and strong commitment from staff in all departments including clinical care.

Only two challenges were present in all of the facilities (stress and time). Only one motivator, the presence of a Wellness Champion, was present in all of the facilities. Only one factor (staff) was both a motivator and a challenge in all of the facilities. A comparison of PHP and non-PHP sites indicated that the PHP sites had a higher number of motivators and the PHP site with the lowest number of motivators (N=7) was still higher than the non-PHP site with the highest number of motivators (N=5). In the PHP sites, team participation went well beyond the planning of individual wellness projects; they had an impact on the empowerment of individuals involved in the team and, as an organizational entity in a long-term nursing care facility, made an impact on the organizational culture.

Discussion

Was this research project a success? Were the PHP intervention sites able to integrate HP and OSH? Were there worthwhile accomplishments? While a number of facilities and their HWTs succeeded in shepherding many impressive accomplishments and integrative of HP and OSH, none of the facilities were able to fully surmount the difficult problem of non-supervisory clinical staff participation. Why was this so? And what were those employees able to bring to this evaluation? What were the effects on individual employees, their co-workers, and their facility?

Assessing the effects of the health and wellness program on individual employees is difficult to ascertain, but the employee focus groups, which were a cross-section of the employee population on a given shift, indicated that the effects on employees was more apparent in the PHP sites than in the non-PHP sites. Awareness of the wellness activities or the HWT was uneven. In some facilities there was little or no knowledge on the part of uninvolved employees of the role of the HWT, who participated, and which activities came from the HWT and which came from the corporation.

Effects on the center indicated that at least two of the PHP intervention sites were somewhat more effective. However, an interesting result of the PHP interventions which relied on employee input and management support raised expectations at the PHP intervention sites. This indicated a concomitant increase in the frustration and disappointment when employee-generated projects were not supported by management. The non-PHP control sites, with fewer projects and lower expectations, had fewer employees with disappointment or frustration.

Conclusions about success include evidence of future sustainability assessed by considering the following issues: (a) how the actual implementation corresponded to the planned activities, (b) what unanticipated obstacles or opportunities arose in the PHP interventions, and (c) where new or revised approaches are needed to overcome obstacles and allow for more sustainability.

Integrating HP and OSH interventions in long-term care facilities through the facilitation effort of a university-based external team is complex and difficult to accomplish. Each of the centers faced similar barriers in terms of staffing, time, and lack of resources. Some of the centers had stronger administrative support than others. When comparing the PHP and non-PHP sites, there were a similar number of activities involving the individual, including healthy recipes, walking, healthy meals, healthy snacks, weight loss, and yoga which existed to a greater or lesser at both the PHP intervention sites and the non-PHP control sites. The number of activities involving OSH and the staff as a whole, which included attempts to improve conditions in the work organization and the work environment included indoor or outdoor break areas, a garden, ergonomics and musculoskeletal training, massages, or organized sports activities. A marked increase in OSH activities was observed in the PHP sites and very few in the non-PHP control sites (see *Table 4)*).

The PHP sites were able to involve more employees in the planning, design, and implementation than the non-PHP control sites. The PHP sites, however, were not more successful in consistently

involving non-supervisory clinical staff than the non-PHP sites and there is much room for improvement, particularly in the area of time and stress. Factors which encouraged or enhanced program success included such issues as leadership support, presence of a wellness champion, resources, staff, time, communications, organizational structure, organizational culture, and the team itself. Of the PHP sites, Facility I-3 had the highest number of motivators including leadership, wellness champion, resources, staff, stress relief, communications, organizational structure and culture, and team. Their willingness to consistently tackle difficult but reachable goals enhanced their effectiveness (see Table 4). There were some differences within each of the non-PHP sites however. Facility C-2 appears to be a workplace with good communication and positive support from management. The administrator, managers, and employees appeared to embrace wellness. The employee focus group indicated that most of the employees seem to be generally happy at this center, with very few complaints. Most people agreed that good communication exists between management and employees and between the people planning the wellness activities and the rest of the management and staff. Although there is no official wellness team, the two employees involved in the planning act as a team and have been successful in that the participation rates are high for their activities. Other facilities seemed confused about the idea of integration. The lone manager at Facility C-2 who seemed to be able to integrate OSH and HP was the new maintenance director who had previous knowledge about ergonomics and musculoskeletal training, leads the safety committee, and is interested in wellness. He shared many ideas for improvements with the researchers and might be a good focal point for integrating OSH and HP at this center.

It can be difficult to predict sustainability of a wellness program for the future. Accomplishments at each center, employee participation, and integration of HP and OSH, though impressive in the PHP sites, are not enough to predict sustainability of the program in the future. In

a research experiment such as this, where the major research questions are to identify ways in which HP and OSH can be integrated using an employee involvement model with outside facilitation assistance, it is more helpful to associate those accomplishments within the context of key factors for sustainability based on the interviews and data obtained. Some of the Wellness Champions and administrators identified the outside facilitators from UML as a vital link to success of projects. Yet when teams have gotten used to outside assistance it can actually be a deterrent to their future independent success. Facility I-2 is a good example of this wherein they had accomplished a number of exciting projects, had attempted some integration of OSH and HP, had strong employee involvement, yet had very little trust in the program's continuation without outside support from UML (see Table 1). One non-PHP site, Facility C-2, stands out above all other control sites. All interviewees at Facility C-2 were optimistic that wellness activities will continue in to the future. Evidence of future sustainability was assessed by considering the following issues: (i) how the actual implementation corresponded to the planned activities, (ii) what unanticipated obstacles or opportunities arose in the PHP interventions, and (iii) where new or revised approaches are needed to overcome obstacles and allow for more sustainability.

The PHP sites were more successful than the non-PHP sites; however, one of the non-PHP sites (C-2) exhibited several factors identified for program success observed in the PHP sites. Prospects for sustainability were derived both through team accomplishments, team evaluations, site observations, and direct questions during each of the interviews and the comparisons made between PHP and non-PHP sites. Only one intervention site (I-2) was considered by all participants interviewed to be non-sustainable though they had made good progress and had some employee participation. Though Facility C-2 had no official team or wellness committee at the center, there were three employees from different departments involved in planning wellness activities for the

center. One of them is viewed as the Wellness Champion by the Administrator and also the staff and managers. Most employees in the focus groups recognize her as well as the other two individuals as the ones who make the wellness activities happen. This was not the case in either of the two other control sites.

In summary, with few resources and the end of outside facilitation, it is difficult to determine which sites will be able to sustain their wellness programs and to what extent they will be impacted at all. In all of the PHP sites, key informants considered UML involvement as a vital link to success. Key factors for success have been identified from this research effort and can have far-reaching benefits to the health and wellness of future employees if implemented carefully and with follow-through. These include (1) the presence of active and strong leadership both from the administration and the HWT, (2) the consistency of a Wellness Champion to act as a liaison between the employees and the administration and has adequate time and support to follow through with programs, (3) adequate funding and resources for employee wellness to prioritize employee health and so that staff do not have to engage in lengthy fund-raising activities, (4) employee awareness and commitment to the planning of and wellness activities as a priority for staff, (5) attention to the effects of stress and the attendant relief from stress that wellness activities which highlight OSH, (6) an approach to time and innovative ways to handle universal issues of lack of time for planning and attending wellness events and activities, (7) effective and consistent communications between administration and employees, (8) creating an organizational culture and structure in which employee wellness is an inherent part of the facility, and (9) wellness planning teams that had consistent and strong commitment from staff in all departments including clinical care.

Though some research questions were clearly addressed, many remain. More research is warranted in a project such as this. Through the support of funding through UML, the research team

has amassed a vast amount of data which could be used for future program analysis and changes for

long-term nursing care facilities and perhaps other industries as well.

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APPENDIX

**Pro-Care Final Evaluation Questions
for
Administrators -- Intervention Sites**

Introduction: This is our end-of-grant evaluation and we are using it to look at the progress of Health and Wellness programs over the past three years, to look at ways the program can be improved, and to assess the sustainability of the program. We want to begin by looking at changes in the center over the past three years. Then we'll ask more specifically about the Health and Wellness program. Some of these questions you may have answered previously, but we'd like to hear from you about your perspectives on the project.

1. How long have you been in your current position?
   Probe:
   - How long at this center?
   - How long at Genesis?
   - Where were you before?

2. What do you see as your main focus as an Administrator?

3. How has your center changed over the past three years?

4. How has the economic crisis affected you as an Administrator of this center?
   Probe:
   - Staffing?
   - Cutting back hours?
   - Layoffs?
   - Funding for new projects?
   - What else?

5. Genesis as a corporation has been interested in changing and improving on an ongoing basis. There are often new programs being instituted which compete for your time and focus as an Administrator.
   Probe:
   - Culture Change
   - Management Training/Coaching Supervision
   - Healthy Lifestyle
   - Safe Resident Handling Program
   Follow-up:

   - Are there ways the Health and Wellness Program can help or interact with those programs?
   - How do you prioritize Health and Wellness vs. all the corporate programs? Given that, how do you see Health and Wellness fitting in? (M/A)

6. What do you see as the major accomplishments of the Health and Wellness Team?
   Probes:
   - List the projects their team has developed
   - What do you think the Health and Wellness Team has contributed to the center?
   - When you think of the Team, how successful have they been?

7. What does success mean to you?
   Probes:
   - Number of employees engaged in the team?
   - Number of employees engaged in wellness activities?
   - Healthier workforce?
   - Leadership?
   - What else?

8. What kinds of support are you giving to the Health and Wellness Team?

9. Have you had any difficulties allocating resources to the Health and Wellness Team's programs or determining who would be a liaison to the Team? If so, how? Do you think this might change in the future?

10. What do you see as the major obstacles standing in the way of progress for the Health and Wellness Team?

11. What effects have the programs of the Health and Wellness Team had on the rest of the employees at your center?

12. How do you handle employee suggestions and concerns? (M/A)

13. Now that the first phase of the project through UMass Lowell is winding down, how do you feel about the future and sustainability of the Health and Wellness Team at your center? Why?
    Probes:
    - Worker participation
    - Decision-making
    - Interaction of workers with management

14. Now we'd like to turn our attention to the Wellness Champions. How was your WC selected?
    Probes:
    - How long has the Wellness Champion been in that role?
    - What do you see as their role?
    - What do you expect of them?

- How were they prepared/supported?
- How much time do you expect them to spend on Health and Wellness? on the Team?
- How does H&W fit in with the rest of their work?
- Is there a change in their role after they are appointed officially?
- What is the relationship between the Wellness Champion and the Health and Wellness Team?

15. Since there is always turnover, if the Wellness Champion leaves, how would you replace them?

16. Finally, we want to ask you about the future. How likely is it that the Health and Wellness Team will continue in the future?
    Probe:
    - How important has the support been from UMass Lowell?
    - What do you think the Health and Wellness Team will be doing in a year from now?
    - How many staff will still be involved in the Team?
    - What kinds of activities will they still be involved with?
    - What will it take to keep this effort alive?

17. Any other comments?

Thank you for all of your help in this important part of the project.

Pro-Care Final Evaluation Questions
for
Administrators -- Control Sites

Introduction: This is our end-of-grant evaluation and we are using it to look at the progress of Health and Wellness programs over the past three years. We want to begin by looking at changes in the center over the past three years. Then we'll ask more specifically about your Wellness program. Some of these questions you may have answered previously, but we'd like to hear from you about your perspectives on the project.

1. How long have you been in your current position?
   Probe:
   - How long at this center?
   - How long at Genesis?
   - Where were you before? What position?
   - Were you previously an Administrator?

2. What do you see as your main focus as an Administrator?

3. How has your center changed over the past three years?

4. How has the economic crisis affected you as an Administrator of this center?
   Probe:
   - Staffing?
   - Cutting back hours?
   - Layoffs?
   - Funding for new projects?
   - What else?

5. Genesis as a corporation has been interested in changing and improving on an ongoing basis. There are often new programs being instituted which compete for your time and focus as an Administrator. Can you tell us about some of these programs?
   Probe:
   - Culture Change
   - Management Training/Coaching Supervision
   - Healthy Lifestyle
   - Safe Resident Handling Program
   - Living Well

   Follow-Up: How do you prioritize Wellness vs. all the corporate programs? Given that, how do you see Health and Wellness fitting in? (M/A)

6. Please describe your Wellness program and how successful it has been.

7. When we spoke to you last year, you described the center wellness program as XXXXXX. Has anything developed or changed since then?

8. How well are wellness activities or programs communicated to the staff as a whole – both management and non-management? Are there ways this could be improved?

9. What kinds of support are you giving to the Wellness program?

10. Have you had any difficulties allocating resources to the Wellness programs?

11. What do you see as the major obstacles standing in the way of progress for Health and Wellness at your center?

12. What effects have the programs of the Health and Wellness Team had on the rest of the employees at your center?

13. Are there wellness programs or activities you'd like to see employees take on in the future?

14. Do you have a Wellness Champion? If so, how was your WC selected?
    Probes:

    - How long has the Wellness Champion been in that role?
    - What do you see as their role?
    - What do you expect of them?
    - How were they prepared/supported?
    - How much time do you expect them to spend on H&W?
    - How does wellness fit in with the rest of their work?
    - Is there a change in their role after they are appointed officially?

15. Since there is always turnover, if the Wellness Champion leaves, how would you replace them?

16. How do you feel about your involvement with UMass Lowell? Were the surveys helpful? Any suggestions for future research?

17. Finally, we want to ask you about the future. How likely is it that the Health and Wellness activities will continue in the future?
    Probe:
    What do you think your Health and Wellness activities will be in a year from now?
    How many staff will be involved?
    What kinds of activities will they be involved with?

What will it take to keep this effort alive?

18. Any other comments?

Thank you for all of your help in this important part of the project.

Pro-Care Final Evaluation Questions
for
Employee Focus Groups – Intervention Sites

Introduction: This is our end-of-grant evaluation and we are using it to look at the progress of Wellness programs over the past three years, to look at ways the program can be improved, and to assess the sustainability of the program. We want to begin by looking at changes in the center over the past three years. Then we'll ask more specifically about the Health and Wellness Team and their programs.

1. What is your current position?

2. How has your center changed over the past three years?

3. Are you aware of the wellness activities or programs at the center?
   - Can you tell us what wellness activities have occurred?
   - Are you aware of the activities of the Health and Wellness Team?
   - How effective do you think they were?

4. What do you see as the major accomplishments of the Health and Wellness Team?
   Probes:
   - What do you think the wellness programs have contributed to the center?

5. What wellness programs would you like to see at the center?

6. What does success mean to you?
   Probes:
   - Number of employees engaged in the planning?
   - Number of employees engaged in wellness activities?
   - Healthier workforce?
   - Leadership?
   - What else?

7. What kinds of support have you been able to get from the Health and Wellness Team?

8. What do you see as the major obstacles standing in the way of progress for the Health and Wellness Team at your center?
   a. Do staff members have difficulty getting to meetings, because of work responsibilities?
   b. Is there anything management can do to facilitate attendance of interested staff at these meetings?

9. What effects have the Wellness programs had on the rest of the employees at your center?

10. How well do people in management listen to employee suggestions about wellness? Are there ways that communication between management and employees could be improved?

11. Finally, we want to ask you about the future. How likely is it that Wellness activities will continue in the future at your center?
    Probe:
    - What do you think your Wellness activities will be in a year from now?
    - How many staff will be involved?
    - What kinds of activities will they be involved with?
    - What will it take to keep this effort alive?

12. Any other comments?

Thank you for all of your help in this important part of the project.

Pro-Care Final Evaluation Questions
for
Employee Focus Groups – Control Sites

Introduction: This is our end-of-grant evaluation and we are using it to look at the progress of Wellness programs over the past three years, to look at ways the program can be improved, and to assess the sustainability of the program. We want to begin by looking at changes in the center over the past three years. Then we'll ask more specifically about the Wellness program. Some of these questions you may have answered previously, but we'd like to hear from you about your perspectives on the project.

1. What is your current position?
   Probe:
   - How long have you been in your current position?
   - How long at this center?
   - How long at Genesis?
   - Where were you before?
   - Were you in the same position?

2. How has your center changed over the past three years?

3. Are you aware of the wellness activities or programs at the center?
   - Can you tell us what wellness activities have occurred?
     o If there is a wellness committee, ask if they are aware of their activities/ projects.

     o How effective do you think they were?

4. What do you see as the major accomplishments of the Wellness program?
   Probes:
   - What do you think the wellness programs have contributed to the center?

5. What wellness programs would you like to see at the center?

6. What does success mean to you?
   Probes:
   - Number of employees engaged in the planning?
   - Number of employees engaged in wellness activities?

- Healthier workforce?
- Leadership?
- What else?

7. What kinds of support have you been able to get from the Wellness program?

8. What do you see as the major obstacles standing in the way of progress for the Wellness program at your center?

      a. Do staff members have difficulty getting to meetings, because of work responsibilities?

      b. Is there anything management can do to facilitate attendance of interested staff at these meetings?

9. What effects have the Wellness programs had on the rest of the employees at your center?

10. How well do people in management listen to employee suggestions about wellness? Are there ways that communication between management and employees could be improved?

11. Finally, we want to ask you about the future. How likely is it that Wellness activities will continue in the future at your center?
Probe:
- What do you think your Wellness activities will be in a year from now?
- How many staff will be involved?
- What kinds of activities will they be involved with?
- What will it take to keep this effort alive?

12. Any other comments?

Thank you for all of your help in this important part of the project.

Pro-Care Final Evaluation Questions
for
Health and Wellness Team – Intervention Sites

Introduction: This is our end-of-grant evaluation and we are using it to look at the progress of Health and Wellness Program over the past three years, to look at ways the program can be improved, and to assess the sustainability of the program. We want to begin by looking at changes in the center over the past three years. Then we'll ask more specifically about the Health and Wellness program. Some of these questions you may have answered previously, but we'd like to hear from you about your perspectives on the project.

1. What is your current position at the center and how long have you been on the Health and Wellness Team?

2. How has your center changed over the past three years?

3. (Read them a list of wellness activities that the Health and Wellness Team has offered.) Can you tell us which activities have been most successful in the past 3 years? Why?

4. How effective is the Health and Wellness Team? [EFFECTIVENESS]
   o Do you meet regularly? If so, how often?
   o How many members do you have? Is there a cross-section of supervisory and non-supervisory employees? If so, describe?
   o Overall, how effective do you think you have been in the past 3 years?

5. What do you see as the major accomplishments of the Health and Wellness Team? [EFFECTIVENESS]
   Probes:
   • What do you think the wellness programs have contributed to the center?
   • How has the wellness program helped individuals (please describe specifics)?

6. What wellness activities would you like to see at the center? [READINESS]
   Probes:
   • How do you evaluate when it is a good time to introduce a new activity?
   • What helps to make a new activity work?
   • What stands in your way?

7. What does success mean to you? [EFFECTIVENESS]
   Probes:
   • Number of employees engaged in the team?
   • Number of employees engaged in wellness activities?
   • Healthier workforce?

- Leadership?
- What else?

8. How do you handle employee suggestions and concerns?

9. What kinds of additional support does the Health and Wellness Team need from the center?

10. What do you see as the major obstacles standing in the way of progress for Wellness program at your center?

    a. Do staff members have difficulty getting to meetings, because of work responsibilities?
    b. Is there anything the Wellness Champion can do to facilitate attendance of interested staff at these meetings?

11. What effects have the Health and Wellness programs of had on the rest of the employees at your center? [EFFECTIVENESS]

12. How well are your plans communicated to management? Are there ways that communication between management and the wellness program could be improved?

13. Finally, we want to ask you about the future. How likely is it that Health and Wellness Team will continue in the future?
    Probe:
    - What do you think your Wellness activities will be in a year from now?
    - How many staff will be involved?
    - What kinds of activities will they be involved with?
    - What will it take to keep this effort alive?

14. Any other comments?

Thank you for all of your help in this important part of the project.

Pro-Care Final Evaluation Questions
for
Managers -- Intervention Sites

Introduction: This is our end-of-grant evaluation and we are using it to look at the progress of Wellness programs over the past three years, to look at ways the program can be improved, and to assess the sustainability of the program. We want to begin by looking at changes in the center over the past three years. Then we'll ask more specifically about the Health and Wellness program. Some of these questions you may have answered previously, but we'd like to hear from you about your perspectives on the project.

1. What is your current position?
   Probe:
   - How long have you been in your current position?
   - How long at this center?
   - How long at Genesis?
   - Where were you before?
   - Were you in the same position?

2. How has your center changed over the past three years?

3. Are you aware of the Health and Wellness Team? The Health & Wellness program is aimed at trying to create a healthier work environment at the center – both to encourage individuals to improve their health and to create changes in the center that will reduce stress, improve well-being, and improve employee satisfaction. Issues like communication and teamwork have been part of the team's discussions. Probes:
   - List the projects their team has developed
     - What do you see as the major accomplishments of the Health and Wellness Team?

   - What do you think the Health and Wellness Team has contributed to the center?

4. What wellness programs would you like to see at the center?

5. What does success mean to you?
   Probes:
   - Number of employees engaged in the team?
   - Number of employees engaged in wellness activities?
   - Healthier workforce?
   - Leadership?
   - What else?

6. What kinds of support are you able to give to the Health and Wellness Team?

7. What do you see as the major obstacles standing in the way of progress for the Health and Wellness Team?

8. Staff members often have difficulty getting to meetings, because of work responsibilities. The team meets every other Tuesday from 2-3PM. Is there anything you can do as a manager to facilitate attendance of interested staff at these meetings?

9. Are there ways that communication between management and the HWT could be improved?

10. What effects have the programs of the Health and Wellness Team had on the rest of the employees at your center?

11. How do you handle employee suggestions and concerns?

12. Now that the first phase of the project through UMass Lowell is winding down, how do you feel about the future and sustainability of the Health and Wellness Team at your center? Why?
    Probes:
    - Worker participation
    - Decision-making
    - Interaction of workers with management

13. Finally, we want to ask you about the future. Would you like to see the Health and Wellness Team continue in the future? How likely do you think this might be?
    Probe: From your perspective, what would kind of support would it take to continue?

14. Any other comments?

Thank you very much for your participation in this part of the project.

Pro-Care Final Evaluation Questions
for
Managers – Control Sites

Introduction: This is our end-of-grant evaluation and we are using it to look at the progress of Wellness programs over the past three years, to look at ways the program can be improved, and to assess the sustainability of the program. We want to begin by looking at changes in the center over the past three years. Then we'll ask more specifically about the Wellness program. Some of these questions you may have answered previously, but we'd like to hear from you about your perspectives on the project.

1. What is your current position?
Probe:
   - How long have you been in your current position?
   - How long at this center?
   - How long at Genesis?
   - Where were you before?
   - Were you in the same position?

2. How has your center changed over the past three years?
3. Are you aware of the wellness activities or programs at the center?
   - Can you tell us what wellness activities have occurred?
      o If there is a wellness committee, ask if they are aware of their activities/ projects.

      o How effective do you think they were?

4. If so, what do you see as the major accomplishments of the Wellness program?
Probes:
   - What do you think the wellness programs have contributed to the center?

5. What wellness programs would you like to see at the center?

6. What does success mean to you?
Probes:
   - Number of employees engaged in the team?
   - Number of employees engaged in wellness activities?
   - Healthier workforce?
   - Leadership?
   - What else?

7. What kinds of support are you able to give to the Wellness program?

8. What do you see as the major obstacles standing in the way of progress for Wellness program at your center?

    a. Do staff members have difficulty getting to meetings, because of work responsibilities?
    b. The team meets every other Tuesday from 2-3PM. Is there anything you can do as a manager to facilitate attendance of interested staff at these meetings?

9. What effects have the Wellness programs of the center had on the rest of the employees at your center?

10. How well are wellness plans communicated to management? Are there ways that communication between management and the wellness program could be improved?

11. Do you have a Wellness Champion? If so, how was your Wellness Champion selected?
Probes:

    • How long has the Wellness Champion been in that role?

12. How do you handle employee suggestions and concerns?

13. Finally, we want to ask you about the future. How likely is it that Wellness activities will continue in the future?
Probe:
    • What do you think your Wellness activities will be in a year from now?
    • How many staff will be involved?
    • What kinds of activities will they be involved with?
    • What will it take to keep this effort alive?

14. Any other comments?

Thank you for all of your help in this important part of the project.

**Pro-Care Final Evaluation Questions
for
Wellness Champion –Intervention Sites**

Introduction: This is our end-of-grant evaluation and we are using it to look at the progress of Wellness programs over the past three years, to look at ways the program can be improved, and to assess the sustainability of the program. We want to begin by looking at changes in the center over the past three years. Then we'll ask more specifically about the Wellness program. Some of these questions you may have answered previously, but we'd like to hear from you about your perspectives on the project.

1. What is your current position?
Probe:
   - How long have you been in your current position?
   - How long at this center?
   - How long at Genesis?
   - Where were you before?
   - Were you in the same position?

2. How has your center changed over the past three years?

3. As the Wellness Champion, can you describe your role at the center?

4. Can you tell us what types of wellness activities have occurred in the past 5 years?

5. How effective is the Health and Wellness Team?
   - Do they meet regularly? If so, how often?
   - How many members do you have? Is there a cross-section of supervisory and non-supervisory employees? If so, describe?
   - How effective do you think they have been in the past 5 years?

6. What do you see as the major accomplishments of the Health and Wellness team? [EFFECTIVENESS]
Probes:
   - What do you think the wellness programs have contributed to the center?
   - How has the wellness program helped individuals (please describe specifics)?

7. What wellness activities would you like to see at the center? [READINESS]
Probes:
   - How do you evaluate when it is a good time to introduce a new activity?
   - What helps to make a new activity work?
   - What stands in your way?

8. What does success mean to you?
Probes:
- Number of employees engaged in the team?
- Number of employees engaged in wellness activities?
- Healthier workforce?
- Leadership?
- What else?

9. What kinds of additional support does the Health and Wellness team need from the center?

10. What do you see as the major obstacles standing in the way of progress for Health and Wellness Team at your center?

  a. Do staff members have difficulty getting to meetings, because of work responsibilities?
  b. The team meets every other Tuesday from 2-3PM. Is there anything you can do as the Wellness Champion to facilitate attendance of interested staff at these meetings?

11. What effects have the Wellness programs of had on the rest of the employees at your center?

12. How well are wellness plans communicated to management? Are there ways that communication between management and the wellness program could be improved?

13. How do you handle employee suggestions and concerns?

14. Finally, we want to ask you about the future. How likely is it that Wellness activities will continue in the future?
Probe:
- What do you think your Wellness activities will be in a year from now?
- How many staff will be involved?
- What kinds of activities will they be involved with?
- What will it take to keep this effort alive?
- How long do you think the Health and Wellness Team will continue without UMass Lowell support?

15. Any other comments?

Thank you for all of your help in this important part of the project.

Pro-Care Final Evaluation Questions

for
Wellness Champion – Control Sites

Introduction: This is our end-of-grant evaluation and we are using it to look at the progress of Wellness programs over the past three years, to look at ways the program can be improved, and to assess the sustainability of the program. We want to begin by looking at changes in the center over the past three years. Then we'll ask more specifically about the Wellness program. Some of these questions you may have answered previously, but we'd like to hear from you about your perspectives on the project.

1. What is your current position?
Probe:
   - How long have you been in your current position?
   - How long at this center?
   - How long at Genesis?
   - Where were you before?
   - Were you in the same position?

2. How has your center changed over the past three years?

3. As the Wellness Champion, can you describe your role at the center?

4. Can you tell us what types of wellness activities have occurred in the past 3 years?

5. How effective is your wellness committee? [EFFECTIVENESS]
   o Do they meet regularly? If so, how often?
   o How many members do you have? Is there a cross-section of supervisory and non-supervisory employees? If so, describe?
   o How effective do you think they have been in the past 3 years?

6. What do you see as the major accomplishments of the Wellness program? [EFFECTIVENESS]
Probes:
   - What do you think the wellness programs have contributed to the center?
   - How has the wellness program helped individuals (please describe specifics)?

7. What wellness activities would you like to see at the center?
Probes:
   - How do you evaluate when it is a good time to introduce a new activity (readiness)?
   - What helps to make a new activity work?

- What stands in your way?

8. What does success mean to you? [EFFECTIVENESS]
Probes:
   - Number of employees engaged in the planning?
   - Number of employees engaged in wellness activities?
   - Healthier workforce?
   - Leadership?
   - What else?

9. What kinds of additional support does the Wellness program need from the center?

10. What do you see as the major obstacles standing in the way of progress for Wellness program at your center? [READINESS]

   a. Do staff members have difficulty getting to meetings, because of work responsibilities?
   b. Is there anything you can do as the Wellness Champion to facilitate attendance of interested staff at these meetings?

11. What effects have the Wellness programs of had on the rest of the employees at your center?

12. How well are wellness plans communicated to management? Are there ways that communication between management and the wellness program could be improved?

13. How do you handle employee suggestions and concerns?

14. Finally, we want to ask you about the future. How likely is it that Wellness activities will continue in the future?
Probe:
   - What do you think your Wellness activities will be in a year from now?
   - How many staff will be involved?
   - What kinds of activities will they be involved with?
   - What will it take to keep this effort alive?

15. Any other comments?

Thank you for all of your help in this important part of the project.

**Pro-Care Final Evaluation Questions
for
Wellness Committee – Control Sites**

Introduction: This is our end-of-grant evaluation and we are using it to look at the progress of Wellness programs over the past three years, to look at ways the program can be improved, and to assess the sustainability of the program. We want to begin by looking at changes in the center over the past three years. Then we'll ask more specifically about the Wellness program. Some of these questions you may have answered previously, but we'd like to hear from you about your perspectives on the project.

1. What is your current position and how long have you been part of the XXXX Committee?

2. How has your center changed over the past three years?

3. Can you tell us what types of wellness activities have occurred in the past 3 years?

4. How effective is your wellness committee? [EFFECTIVENESS]
   o Do you meet regularly? If so, how often?
   o How many members do you have? Is there a cross-section of supervisory and non-supervisory employees? If so, describe. If not, why?
   o How effective do you think you have been in the past 3 years?

5. What do you see as the major accomplishments of the Wellness program? [EFFECTIVENESS]
Probes:
   • What do you think the wellness programs have contributed to the center?
   • How has the wellness program helped individuals (please describe specifics)?

6. What wellness activities would you like to see at the center? [READINESS]
Probes:
   • How do you evaluate when it is a good time to introduce a new activity?
   • What helps to make a new activity work?
   • What stands in your way?

7. What does success mean to you? [EFFECTIVENESS]
Probes:
   • Number of employees engaged in the team?
   • Number of employees engaged in wellness activities?
   • Healthier workforce?
   • Leadership?
   • What else?

8. What kinds of additional support does the Wellness program need from the center?

9. What do you see as the major obstacles standing in the way of progress for Wellness program at your center?

   a. Do staff members have difficulty getting to meetings, because of work responsibilities?
   b. Is there anything you can do as the Wellness Champion to facilitate attendance of interested staff at these meetings?

10. What effects have the Wellness programs of had on the rest of the employees at your center?

11. How well are wellness plans communicated to management? Are there ways that communication between management and the wellness program could be improved?

12. How do you handle employee suggestions and concerns?

13. Finally, we want to ask you about the future. How likely is it that Wellness activities will continue in the future?

Probe:
   - What do you think your Wellness activities will be in a year from now?
   - How many staff will be involved?
   - What kinds of activities will they be involved with?
   - What will it take to keep this effort alive?

14. Any other comments?

Thank you for all of your help in this important part of the project.

Pro-Care: Promoting Physical and Mental Health of Caregivers through Transdisciplinary Intervention

Scientific Conference Presentations, 7/1/2006 -6/30/2011

Presentations are listed in descending chronological order, by name of conference

New England College of Occupational and Environmental Medicine, 2010 Annual Conference, Newton MA, 2010
- Workplace health: Who's taking care of health care workers?

PREMUS: Seventh International Scientific Conference on Prevention of Work-Related Musculoskeletal Disorders, 2010
- Using an index of physical workload for nursing assistants to measure the effects of a no-lift program in nursing homes.
- Changes in ergonomic exposures of nursing assistants following a no-lift program in nursing homes.

Towards Better Work and Well-being, Finnish Institute of Occupational Health, Helsinki, Finland, 2010
- Work organization and health in long-term care: Comparison of perceptions between caregivers and management and a preliminary analysis of participatory interventions.

APA-NIOSH-SOHP, 2009
- Differences in JCQ factor structure and item distribution in two study populations.
- Health and wellness intervention research in the nursing center industry: a preliminary analysis of participatory intervention.
- Net costs of a no-lift intervention program in a large chain of nursing homes. Symposium Paper:
- *Building sustainable worker-based health programs: Barriers and opportunities in the long-term care sector.*

APHA Annual Meeting, Philadelphia PA, 2009
- Factors associated with changes in ergonomic exposures among nursing assistants after the introduction of a no-lift program in nursing homes.
- Net costs of a no-lift intervention program in a large chain of nursing homes.
- Validation of a worksite readiness checklist (WRCL) for implementation of health promotion programs.
- Work organizational features associated with health behaviors among nursing home personnel.
- Work organization and health issues in long term care nursing centers: Comparison of perceptions between caregivers and management.

Department of Allied Health Science/Health Promotion, Univ. of Connecticut, Storrs, 2009
- Work organization and health behaviors

X2009 Sixth International Conference on Innovations in Exposure Assessment, Boston MA, 2009

- A proposed index of physical workload for nursing assistants in nursing homes

Dartmouth Medical Center, Hanover NH, 2009
- Work-related musculoskeletal disorders: A case study in occupational health in the health care sector.

APHA Annual Meeting, 2008
- Establishing a sustainable participatory occupational health/health promotion program among nursing home employees.

New England Chapter of the Human Factors & Ergonomics Society Student Conference, Boston MA, 2008
- An index of physical workload to evaluate an ergonomics program in nursing homes.

5th Congress of Women, Work, and Health, Zacatecas MX, 2008
- Changes in ergonomic exposures of nursing assistants following a no-lift program in nursing homes.

UMass Lowell Research Seminar Series, 2008
- Promoting physical and mental health of caregivers through trans-disciplinary intervention (Pro-Care): effectiveness of an ergonomics program and need for health promotion.

Work, Stress, and Health, APA-NIOSH-SOHP, 2008
- Site evaluations for participatory nursing home clinical staff wellness programs.

PREMUS: Sixth International Scientific Conference on Prevention of Work-Related Musculoskeletal Disorders, Boston MA, 2007
- Changes in manual handling across job titles before and after the introduction of a no-lift program in nursing homes.

Project B: Health Improvement through Training and Employee Control (HITEC)

Grant Number 1U19 OH008857

Grant period: July 1, 2006 to June 30, 2011

Report Date: November 20, 2011

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List of Terms and Abbreviations:

BMI: Body Mass Index

CARO: Connecticut Airfoil Repair Operations

CEA: Claims Account Executive

CESD: Center for Epidemiological Studies Depression Scale

CO: Corrections Officer

CTRP: Connecticut Rotating Parts

CTSC: Connecticut Stators and Components

DOC: Department of Correction

DT(s):   Design Team(s)

EHRO: East Hartford Repair Operations

ESP: Employee Sponsored Participant Groups

FPALS: Food and Physical Activity Liking Survey

FRT: Functional Reach Test

HP: Health Promotion

HRA: Health Risk Assessment

IAS: Intervention Assessment Survey

IS :   Insole Survey

JCQ: Job Content Questionnaire

NPAQ: Nutrition and Physical Activity Questionnaire

OHS: Occupational Health and Safety

PAR: Participatory Action Research

PATH: Position Activity Tools and Handling

PE: Participatory Ergonomics Program

PW: Pratt & Whitney

R2P: Research to Practice

SOC: Standard of Care

WC: Workers Compensation

WHP: Workplace Health Promotion

WRCL: Worksite Readiness Check List

HITEC Figures

Figure 1   Mean body mass index (BMI) of DOC correction officers, by year of seniority.

HITEC Tables

Abstract

The HITEC (Health Improvement through Employee Control) study compared two approaches to integrating workplace safety and health with worksite health promotion (WHP). The first or *professional approach* relied on a best practices, management-sponsored program. The second or *participatory approach* developed participatory design teams (DTs) consisting of line workers, with investigator support and technical input. Each team worked with a facility-level steering committee.

HITEC engaged two Connecticut employers. The first was a major aerospace manufacturer, which contributed three sites (two participatory and one professional). The second was the Department of Corrections (DOC), providing two prison facilities selected for their similarities through a structured site selection process.

The manufacturing effort was impacted by the closing of two facilities and a related increase in stress, underlining the importance of job insecurity and job loss on worker health. The large separation of interests between management and the workforce compromised labor-management cooperation, although the workforce effectively combined ergonomics and WHP at the small group level.

The DOC project documented high levels of morbidity in the workforce, even in the first years of employment, and was significant for the demonstrated acceptance of the participatory approach and several important changes in the work environment and individual health. The Design Team (DT) at the participatory site met regularly for 3 years, generally on a monthly basis, with release time arranged by DOC administration and collective bargaining units. A supervisors' DT met for one year. The facility-specific steering committee and study-wide oversight committee, comprised of supervisory staff and leadership, met at least quarterly. Successful DT projects were:

1. *Work Culture: Incivility.* The design team conducted a conflict resolution program to reduce outbursts and develop informal processes to resolve staff conflicts without formal investigation. Post-evaluation showed rank and file enthusiasm and significant improvement in behavior.
2. *Ergonomic Workstation Evaluations.* The Supervisor DT undertook evaluations of the computer terminal workstations most used by supervisors, many of whom reported neck and upper extremity discomfort. An investigator and certified ergonomist provided the team with training. Unfortunately, the team disbanded before recommendations could be acted upon.
3. *Shoe Insert Program.* Knee and hip disorders and falls while attending to emergencies were a major source of reported injury and lost work time. Three issues contributed: smooth floor surfaces (largely a corrections safety procedure), officer conditioning and musculoskeletal health, and footwear. The design team conducted a one-month trial of new insoles and found improved comfort among 50% (10/20) of participating officers.
4. *Weight Loss Program.* The design team sponsored a weight loss program which had 82 registrants, 71 participants, and 16 who completed the program. This participation rate was more than twice as high as a CPH-NEW directed program at the matched professional site. To date, this has been by far the most successful weight loss program undertaken at DOC.

The corrections officer population is often characterized as resistant to change. HITEC results contradict this negative assessment. The design team activities were considered highly successful by both focus group evaluation and external review.

Significant Findings

Findings relevant to Aim 1

- Despite being characterized elsewhere as a highly resistant population, COs proved to be highly responsive to participatory health and workplace programs. HITEC demonstrated program feasibility and efficacy.
- The participatory action research (PAR) model took hold in corrections, supported by the construction of participatory structures at the workforce and facility levels, and was considerably more effective than in a large private sector manufacturing firm, where the more gradual cooperatist model of change based on cultural change and combining individual and environmental features seemed to translate less effectively.

Findings relevant to Aim 2

- Corrections Officers (COs) had considerably worse baseline health parameters than predicted from normative data. Strikingly, given the entry fitness requirements, adverse health patterns were established in the first 5 years of employment.
- In corrections the top-down best practices approach was much less effective, despite its more extensive content. Similarly, in large-scale manufacturing, small group efforts at WHP and participatory ergonomics were more effective than corporate-wide initiatives.
- In manufacturing, plant lay-offs and closures produced perceptions of poorer health despite WHP and participatory ergonomics. Dramatic top-down reorganizations and the inability of management to incorporate bottom-up work design interventions combined to undermine continuation of the program before the end of the grant period.

Findings relevant to Aim 3

- An overall model has been constructed for worker's compensation data. One complication has been an apparent asymmetry between declining utilization at the study sites, but increased overall costs. The reasons are currently being studied.

Translation of Findings

Employers and insurance companies should consider the following issues to achieve effective workplace employee health programs:

- For private multinational manufacturers involved in ongoing and potentially dislocating change, an aggressive kaizen type of approach is likely to be preferable to the more gradual cooperatist model of change based on cultural change and combining individual and environmental features.
- The coincident construction of participatory structures at the workforce, facility and cross-project levels creates structures that are more durable to a changing work environment.
- The buy-in of a senior management is not sufficient to provide sustainable programs unless there is a delegation of authority to a functional level.
- The differences between the public and private sectors require different types of intervention programs.

As part of CPH-NEW, HITEC can offer materials to achieve these goals, developed with HITEC input through the R2P Toolkit project (Project D) and Stress@Work, the Dissemination project, (Project C):

1. **Worksite Readiness Checklist**
2. **Key Personnel Interview Guide**

3. **Steering Committee Creation & Orientation Guide**
4. **All-Employee Survey & Feedback Report Guide**
5. **Employee Focus Group Guide**
6. **Employee Short Survey Guide**
7. **Employee Design Team Creation & Orientation Guide**
8. **Ergonomics Training and Walk-through Evaluation**
9. **Health Promotion Training**

OUTCOMES/RELEVANCE /IMPACTS

Potential outcomes: There are more than three million jail and correctional institutional officers in the United States. Due to physical danger, low autonomy, and work-family conflict, the corrections sector has been associated with high rates of psychological distress. During the HITEC observation period, the crude death rate of COs aged 30-49 was 106 per 100,000, three times the average for the age-equivalent State of Connecticut workforce. DOC study participant health status was alarming, particularly as COs enter employment following rigorous physical and mental health screening. Eighty-three percent were overweight or obese; 19% were hypertensive; and 31% were seriously depressed. These conditions could be positively impacted if effective employee health programming were implemented in corrections settings.

HITEC seems to have succeeded where other programs have failed, despite their good features. The reason lies in HITEC integration with the existing DOC culture and programs, including a high degree of cooperation with and reliance on co-workers. To our knowledge, no other intervention program initiated in the United States has duplicated HITEC's successes. There is a considerable distance to go to secure sustainability and long-term effectiveness, and to disseminate effective models more broadly, but HITEC has already had important local impact.

Scientific Report

Background

HITEC's importance rests on the high health risks to DOC personnel and the sparseness of OHS research literature. Corrections officers (COs) have been characterized as almost impervious to workplace health promotion. Futility was replicated in Connecticut in the 1990s when WorkLife programs were introduced with National Institute for Justice support. Provoked by gang violence, Connecticut sponsored surveys of over 4000 DOC employees, mentoring of new officers, focus groups, and work-family stress reduction groups. The programs were neither accepted nor sustained. Similarly, DOC's existing WHP programs include well-meant but often ineffective internal committees around stress reduction, family support, and peer counseling.

In its baseline articulation, HITEC's rationale was predicated on a literature that highlighted sustainability of programs as a major uncertainty and also suggested the importance of participatory programs, particularly participatory ergonomics, as an approach to integrating health promotion and occupational safety and health. The HITEC proposal took note of successful cooperative activities that fit into more traditional workplace culture, such as health and safety committees and apprenticeship programs. These expectations were largely borne out in the success of the participatory activities. The importance of mental health and work-family conflict was also a basis for the proposal. These factors have been extremely important in predicting the health of corrections officers. However, the background literature did not prepare the study team for the limited value of many traditional survey instruments in characterizing corrections.

HITEC had intended to use a simple net-cost model to characterize interventions, as this had been successful in other studies. However, the complex factors that drive health care costs were not well captured and probably require a more sophisticated model.

The advocacy of physical measures as indicators of change has produced mixed results. In fact, the measures of body mass, body fat, and strength have been useful. Range of motion measures have been less useful to date.

HITEC's proposed significance rested on the application of participatory research to these intervention studies, the inclusion of factors that were outside of the workplace, and the importance of mental health issues. All of these have proved to be important, although the predominance of workplace over non-workplace factors has been greater than expected.

Specific Aims

Aim 1. Creation of semi-independent employee sponsored participant (ESP) groups (subsequently termed 'Design Teams') that will devise a program combining individual health promotion with a corresponding worksite health and safety intervention.

Aim 2. Development of evaluation processes sufficient to compare outcomes from ESP programs to a more traditional wellness and ergonomic programs: the standard of care (SOC) (subsequently termed 'professional').

Aim 3. Development of economic and econometric models for assessing effectiveness, costs, and benefits of interventions, and providing a program evaluation model that is understandable, reproducible, and acceptable to all participating parties, and in particular to insurers and financial representatives.

Aim 4. Direct participation of the insurance carrier in quantifying costs and benefits, in developing a rate-based incentive structure, in "institutionalizing" the employer's involvement, and in disseminating results.

Study Overview

The HITEC study had two different locales: 2 Department of Correction (DOC) sites, and 3 Pratt Whitney (P&W) manufacturing sites. HITEC posed the comparison of a best practices professional site with a parallel facility utilizing a pure participatory bottom up approach. The participatory groups are referred to in HITEC as Design Teams (DTs). For DOC, the Corrigan correctional facility was the professional site and the Cheshire correctional facility was the participatory site. For P&W, EHRO and CARO were identified as the participatory sites and Cheshire engine repair as the professional site.

The experiences at DOC and P&W diverged in fundamental ways, apart from their identities as manufacturing and public workforce sites. Work at the two DOC sites progressed fundamentally as planned and therefore provided a suitable environment for testing study hypotheses. Nonetheless, DOC has had significant fiscal challenges. In the course of the HITEC study, 3 non-study facilities closed leading to inter-facility transfers of staff. At the participatory site, there were three changes of wardens in four years and there were four changes over the same time interval at the professional site. At Corrigan, 22% of the study population transferred or retired during the 14 month interval between baseline and follow-up evaluations. At Cheshire, the percentage was lower (19%), but substantial. However, from 2009-2011, the retirement rate slowed with fewer new recruit replacements. However, this sort of volatility is endemic to Corrections. HITEC's three level approach to study management and intervention: a study wide labor-management steering committee, a facility specific oversight committee utilizing historic officer-supervisor institutions, and a corrections officer (CO) driven DT, has proven to be sufficiently robust to weather significant institutional change. Accordingly, the participatory action research (PAR) model for HITEC was had successful application to DOC.

The situation at P&W was also challenging, but the study was less successful. After extensive baseline data had been collected, the CARO participatory site was closed in 2010. The professional site, the Cheshire facility, was formally closed in early 2011 with attrition beginning in 2010. Both plant closings were unanticipated by the study team and the employees and resulted in dispersion of the workforce and an abandonment of the original study design, fully 2 years into the project. The remaining manufacturing site, the EHRO participatory site, was reorganized and divided into two separate units, called CTSC and CTRP. There have been continuous lay-offs in the former EHRO rump facility.

HITEC was designed to work with a successful and established internal ergonomic design team with the goal of amending participatory ergonomics to include worksite health promotion (WHP). The break-up of EHRO also lead to the dismantling and reformulation of the participatory ergonomics program. The administration at P&W was also in upheaval. The corporate personnel who had championed the work with HITEC were particularly prone to relocation and transfer. In 2008-2009 there were two corporate medical directors, and then the position was eliminated. The global health group that was responsible for corporate liaison with HITEC underwent three changes of lead personal from 2009-2011. The changes in senior corporate personnel, the elimination of the key facilities, and the reconstruction of the internal participatory ergonomics program upended the planned approach to broad comparative interventions at parallel sites. Because of the changes in organization and leadership personnel, the HITEC program focused strictly on small units or Cells. The decision took place after failure of several large scale models and was arrived at through a participatory process involving mid-level health, team level supervisors and safety managers and the workforce. The cell-based approach, entitled the "4 I" approach: Introduction, Initiation, Implementation, Integration. The approach featured cell-based meetings, an intense short-term program and pre and post assessment. While well received by the cells, the intense small group nature and distance from international and regional management limited its generalizability.

<u>Methodology</u>

Originally, HITEC proposed to recruit participating employers among national manufacturers selected from Travelers Insurance clients, directly solicited by senior account executives. A detailed selection process to determine readiness for integrated "worklife" programs was applied to more than 1200 companies [Cherniack et al., 2010a]. Measures included management surveys, premium cost and risk profiles, and a Workplace Readiness Check List (WRCL). Quantitative and qualitative measures identified the 14 companies most "ready for change" but failed to predict actual participation. Follow-up surveying showed the importance of economic conditions in deterring workplace programs. HITEC was subsequently based at an aerospace manufacturer (Pratt and Whitney), following interest expressed by case managers and the medical department, and the CT Department of Correction (DOC) at the request of the Connecticut State Employees Association (CSEA), due to perceived poor health of corrections personnel.

National Selection Strategy

HITEC's first year was dedicated to a national strategy composed with the Traveler's Corporation to select two sets of two national account companies deemed most ready for introducing an intervention study aimed at integrating occupational health and safety with worksite health promotion. The study team and a 12-member Travelers working group named *Health Promotion and Behavior on the Workplace* met monthly throughout the year. A 36-item scaled survey tool was jointly designed to screen 1200 corporate clients as possible sites. This was completed by the appropriate claims account executive (CAE). Measures included management surveys, premium cost and risk profiles, and a Workplace Readiness Check List (WRCL) [Cherniack et al., 2010]. Quantitative and qualitative measures identified the 14 companies most "ready for change" but failed to predict actual participation. The list was reduced to 2 national market companies (sites) with facilities in Connecticut and Long Island. Detailed slide shows and project books were developed for the CAE's, underwriters, and brokers. Materials were individualized to each site. The two companies had each indicated a strong interest in an onsite WHP program. Discussions and presentations proceeded from November 2006 through March 2007. In addition, a detailed time allocation profile was completed at the site level, providing for all estimated staff and workforce time. This was a reductive strategy concentrating on finalization of "best sites." Follow-up surveying showed the importance of economic conditions in deterring workplace programs.

Local Site Selection Procedure.

Site selection continued through the Traveler's Employer School and through program contacts. The Employer School did identify three companies but they each had fewer than 300 employees (300 per site was an admission criterion) or were located too far from the New England region. Research plans were developed for 11 companies and two public agencies, many of whom rejected HITEC, a decision attributed to the poor economy and rising tensions with their unions. Eventually, in early Year II, two local institutions were selected: the Connecticut Department of Corrections and Pratt and Whitney Aircraft.

P&W satisfied selection criteria but was not a Traveler's client. The selection of the P&W participatory and professional sites was made by the study team and Pratt and Whitney senior managers. It turned out that relying on direct experience and program did produce candidate companies, utilizing lists of client companies for which the occupational medicine professional group had done previous consulting. Pratt and Whitney was selected because of its national prominence and because its participatory ergonomics program (PE) was known to the study team and had received national recognition. A modified form of the WRCL was used to rate the best in-state site. Interestingly, another company

scored higher but the study team deferred to Pratt and Whitney again because of its prominence and seemingly effective participatory ergonomics.

DOC involved a more complicated and structured process because of study team's unfamiliarity with corrections and because an 8-month-long participatory process was undertaken with DOC administrators and the major bargaining units. Also, the Governor's Office had requested that we consider inclusion of a State agency. There was an extensive pre-study site selection and preparation process that required more than a year and was primarily intended to overcome anticipated institutional barriers. Moreover, the corrections literature is sparse; that lack of literature and the State's prior failures with WHP in corrections were important considerations, suggesting a large opportunity for improvement. Focus groups were held with DOC administrators, supervisors, line officer personnel and representatives of other State agencies. The preparation focus groups eventually merged into the DOC study-wide steering committee which has been robust and the most important component of program stability. The preparation process was foreseen as a necessity for confronting barriers to entry; its main value, the creation of a viable study-wide steering committee, was essential for participatory action research although unintended.

The selection process was as follows:

1. A review of worker's compensation, demographic, and facilities based on records from all State facilities

2. Repeated site visits to 9 facilities, including meetings with key personnel

3. A management readiness survey was sent to 598 supervisors at 21 facilities, in order to identify most culturally similar organizations.

4. A DOC-wide steering committee was set-up involving central administration, wardens, union representatives and health personnel to advise on final selection, implementation and system-wide dissemination.

Two facilities, Cheshire and Corrigan, were selected. Two additional sites that rated somewhat lower in their coherence scores were identified for comparison of passively acquired data, particularly absenteeism and worker's compensation claims.

Cheshire and Corrigan had several important similarities, including workforce size, correction officer (CO) age and injury rate (Table 1).

Table 1. Workforce characteristics at two DOC facilities participating in the HITEC study.

Facility	Workforce	COs	CO:Inmate Ratio	Avg. Age CO	Age Range CO	Annual Avg Illness/Injury	Rate/CO	Av Annual MS Strain	Rate/CO
Cheshire	428	340	4.39	40.9	21-68	707	1.65	165	0.39
Corrigan	434	349	4.83	39.57	22-61	625	1.44	210	0.48

Assessment Methods

Surveys

There were four assessment tools designated for HITEC : 1) the HITEC core survey, a long form multi-domain questionnaire that includes CPH-NEW core domains; 2) short pre- and post- surveys to evaluate participation and intervention effectiveness; 3) tools for qualitative assessment, and 4) and a widely used national HRA instrument.

The core survey was administered on three occasions at DOC at baseline in 2008, at mid-point and at conclusion in 2011. The core survey was administered at baseline in Pratt and Whitney. There was an effort to administer the survey to exit workers at the CARO and Cheshire facilities at their closure. This was unsuccessful due to low worker interest. A mid-point survey at EHRO was rejected by Pratt and Whitney management due to work reorganization. The company also decided to reject the 2011 close-out Time 3 survey due to the changed work conditions.

HITEC Core Survey. The current Core Survey has more than 25 domains. Key domains overlap with the ProCare (Project A) survey and the "All-Employee Survey" from the CPH-NEW R2P Toolkit. The goal was to select widely used validated instruments, thus enhancing inter-study comparison. As noted above, standard survey instruments have been problematic at DOC. Their insensitivity was also noted by Schaufeli and Peeters in their review of corrections officers (2000). It was administered on three occasions to the DOC workforce at 16 month intervals. The WellSource Health Risk Assessment (HRA) was administered with the Core Survey. The study team has decided against it use in further DOC studies. HRAs are limited as research tools because of selective and non-validated domains. Their utility comes from ease of translation to a clear, simple individual report. It was used in HITEC to support a best-practices approach in Corrigan; reports were followed by individualized consultation with supervised nursing students. The approach was deemed a failure at Corrigan: 153 participants completed the HRA, but only 8 kept appointments with the nurse. HRAs were also returned at Cheshire, but the DT rejected nurse consultation.

HITEC Short Surveys. Surveys included pre-intervention assessment tools for individual and DT feedback, and pre- and post- intervention surveys. Short surveys were used in three ways: 1) assessment of effective change free of recall biases; 2) assessment of overall program participation and engagement; and 3) regular assessment of core health and wellbeing domains likely to be affected by an intervention. The core concept was to assess health and work environment status immediately before and after interventions. A description of short surveys follows:

i. Intervention Assessment Survey (IAS). The IAS is a short health and environment survey that contains fewer than 10 questions and requires about 5 minutes to complete. It is intended for DT administration. Core domains (general health, physical symptoms, physical and emotional health, work conditions, workplace change, work environment) were factored from Core Survey responses. The IAS is modular and the DT selected the specific question set. To allow pre- and post- comparisons that are identifiable only to a participant, respondents provide their own idiosyncratic code (phone digits + PIN). The domains and format are IRB-approved so that DTs can choose modules without requiring IRB submission. Its generic use was reduced by a low rate of return when DT administered. It is anticipated that future use will require multi-instrument augmentation with interviews. It was more successfully used at P&W where the return rate was over 70% in the cell-based activities. The most likely reason for this success was the assembly of the full workforce for weekly pre-shift task meetings.

ii. Insole Survey (IS). The insole survey was an ergonomic pre- and post-survey that was used to assess footwear and leg problems at DOC. It contains 15 items and takes 10 minutes to complete. Questions involve foot, leg and back health, footwear use, floor surfaces, general conditioning and exercise level, and job content. The follow-up also includes assessment questions on the effectiveness of interventions. Results were used to optimize footwear, to examine changes in work conditions, to assess possible changes in lifestyle such as increased exercise due to reduced foot, leg and back discomfort, and to advise on general physical and health risks.

iii. The Nutrition and Physical Activity Questionnaire (NPAQ) was developed by the CPH-NEW team; it includes 10 questions adopted from the Hawkes and Nowak nutrition knowledge questionnaire [1998] and 26 items that assess eating patterns at the workplace. It was subsequently customized to the

corrections setting and has been used by the Cheshire DT and in the Corrigan professional program for weight loss and exercise programs. It was also used at Pratt and Whitney with the cell-based assessments.

iv. The Food and Physical Activity Liking Survey (FPALS) utilized in this study was created by CPH-NEW Affiliate Dr. Duffy and her students and customized for direct feedback to DOC users. Participants answer demographic questions, estimate their body size (based on a nine-figure Stunkard Scale [Stunkard, 1981], and rate 59 food/beverage items and 10 non-food related items on a general Labeled Magnitude Scale. This was used in the three weight loss programs that were administered by HITEC.

v. R2P Toolkit All-Employee Survey has a DOC variant designed for use by DTs and middle-level administrators with modest consultative assistance. There were three objectives: 1) creation of a reduced item survey capturing most core survey domains; 2) scale reduction through psychometric analysis, by removing items not affecting reliability; and 3) selection of symptom items correlated with resource-intensive physical examinations, so that interpretability would be preserved. While developed out of HITEC, and assigned throughout Project C sites, including one DOC site, its use at DOC was intended for future assessments.

All short survey instruments were used at DOC. Only the IAS and the NPAQ (generic version) were used at Pratt and Whitney. These were used as cell-based assessment instruments.

Physical Assessment

In HITEC, musculoskeletal health has been characterized by strength, power, mobility of the spine and trunk, and endurance. This occurred at study baseline in 2008 and at study termination in 2011. Table 2 lists the HITEC tests used in 2011, their source and purpose. All HITEC physical tests required a written protocol, training manual and exclusionary criteria for medications and disease. Protocols are attached (Appendix B-1).

Table 2. Physical examination components included in HITEC study.

Name of Test	Purpose	Status for f/u
Anthropometric Assessment	Height (cm), weight (kg), waist circumference (cm)	Maintained
Body Composition /BIA (Sun 2003)	Body fat	Maintained
Grip Strength (Mathiowetz 1984)	Hand Strength	Maintained
Max. power/ ergometry exercise test (McMartney 1983)	Lean muscle function and vO2 max approximation	Maintained
Functional Reach Test (Behrman 2002)	Upper Body Mobility	Dropped due to unreliability
Spine Mobility (Savanainen 2004)	Spinal intervals	Dropped due to unreliability
Blood Pressure	Hypertension assessment	Maintained

The rationale for physical testing is a reflection of the limitations of survey data and the recognition of physical tests that were either age sensitive or amenable to interventions that would measurable over an 18-36 month interval. Based on Time 1 results, revisions were made in the Time II protocol. Changes were introduced where multiple data points provide evidence for unreliable measurement or where QC uncovered inconsistencies not appreciated in pilot testing. In particular, although the FRT is commonly used and well supported in the literature, the HITEC steering committee decided against its continued use because inter-test variability was greater than the expected physical change over a 3 year interval. Similarly, the Spine mobility test, although again commonly used, had similar problems and was replaced with by substitute test with less measurement error. Ergometry measures power output over

60 sec also provided a measure of muscle power. In the literature, it is reported to be highly correlated with V02 max; hence its inclusion in HITEC. The study team has concerns about its stability in a longitudinal study. The test will still be useful as a measure of peak power, but its application may be more limited. These observations raise questions about the use of commonly performed tests in longitudinal studies which require measurement of intervention effectiveness.

Qualitative methods

In HITEC, qualitative assessment served to supplement survey administration. Data were recorded as a single transcript per interview or focus group session and imported into ATLAS TI, a software package designed to handle unstructured qualitative data. Transcribed data are analyzed using the constant comparative method of qualitative data analysis to identify recurrent themes until "theoretical saturation" is achieved; that is, no new themes emerge through subsequent data analysis [Strauss and Corwin, 1998]. In HITEC, all interviews have been reviewed in depth by two researchers and the code structure was reviewed by the full research team for completeness. Independent professional preparation of the transcripts was employed along with IRB review. In addition to standardized coding, an analysis audit trail was constructed to document analytic steps.

Exposure Monitoring

HITEC involved four modes of exposure assessment: 1) survey data,2) direct observation by the study ergonomist and DT, 3) structured time window analysis, and 4) data logging using electrogoniometric sensors. Data logging eventually proved impossible at DOC due to security reasons. It was replaced by limited pedometry. Data logging at Pratt and Whitney was performed at EHRO only.

PATH methodology (Posture, Activity, Tools & Handling) [Buchholz et al 1996] was relied upon for global job review at Pratt and Whitney and DOC. In PATH, observers choose 2 (or more) 15-minute 'windows' during which they a) fill out a single, overall work assessment on the cover sheet, including HAL estimate and b) take a visual 'snapshot' every 30 sec., checking posture and activity categories. PATH's importance was amplified for DOC, because, unlike the manufacturing sites, direct data logging of activity and joint loading was disallowed due to security concerns. PATH and review by the study ergonomists lead to extensive ergonomic evaluations at both facilities.

Results

Pre-Intervention Workforce Health Status

Both focus groups and surveys were used to access participants' health status and needs before the interventions were carried out. Those findings are described first, followed by the program results by Aim.

Both DOC and Pratt and Whitney employees had high levels of obesity, body fat, and hypertension (Table 3). The Pratt workers were 10 years older on average than the DOC employees, the difference being a reflection of the 20-year full-benefit threshold of DOC employees. For most parameters, DOC women had markedly better health indices than men, whereas the male female differences were less marked at Pratt and Whitney. The high prevalence of symptoms and risk factors was also reflected in HRA results.

Table 3. Key baseline health parameters for survey respondents from (a) Pratt and Whitney (P&W) and (b) Connecticut Department of Corrections (DOC).

| Variables	All P&W subjects			All DOC subjects		
	Males	**Females**	**Total**	**Males**	**Females**	**Total**
Participants	346	83	435	242	89	332
Age: mean (sd) / median	48.8 (10.6) 50	49.5 (10.0) 51.5	49.0 (10.0) 51	41.3 (8.3) 40	43.9 (8.6) 43	42.0 (8.4) 41
SF-12 PCS: mean (sd)	50.8 (7.3)	48.8 (8.1)	50.4 (7.5)	51.3 (6.5)	51.3 (8.4)	51.3 (7.1)
SF-12 MCS: mean (sd)	51.6 (8.6)	49.0 (10.5)	51.1 (9.0)	48.9 (10.2)	48.4 (10.4)	48.8 (10.2)
BMI						
Mean (sd)	30.67 (5.8)	31.67 (7.78)	30.83 (6.24)	32.25 (5.31)	28.72 (5.32)	31.28 (5.53)
% Normal	12.0%	23.3%	14.1%	4.0%	24.1%	9.6%
% Overweight	40.5%	21.7%	37.1%	32.2%	44.4%	35.5%
% Obese	47.4%	55.0%	48.8%	63.6%	31.5%	54.8%
Body Fat						
%Healthy	32.3%	37.5%	33.2%	17.6%	55.3%	27.3%
% Overweight	34.2%	30.4%	33.5%	33.1%	21.3%	30.1%
% Obese	32.3%	30.4%	32.0%	48.5%	23.4%	42.1%
Hypertension						
% Normal	21.2%	30.0%	22.8%	16.1%	42.6%	23.5%
% Pre HTN	44.5%	43.3%	44.3%	54.5%	44.4%	51.8%
% HTN	34.3%	26.7%	32.9%	29.4%	13.0%	24.9%

Since musculoskeletal diseases and ergonomic interventions were a key focus of the HITEC study, several injury and pain patterns are compared in Table 4: serious injury in the past 12 months, recent

pain, and lost work time. Injury rates and lost work time were considerably higher in DOC workers than in Pratt and Whitney Workers. Pain patterns were similar between men in both workforces. In general women at Pratt and Whitney had a greater prevalence of musculoskeletal symptoms, except for the low back where reported symptoms were more common in DOC women.

Table 4. Baseline musculoskeletal symptoms and absenteeism among survey respondents from (a) Pratt and Whitney (P&W) and (b) Connecticut Department of Corrections (DOC).

Variables	All P&W subjects			All DOC subjects		
	Males	Females	Total	Males	Females	Total
Serious Injury						
% Low Back	9.90%	9.60%	9.90%	20.20%	16.90%	19.30%
% Shoulder	7.90%	15.70%	9.40%	11.20%	11.20%	11.20%
% Knee	7.30%	8.40%	7.50%	9.90%	10.10%	10%
Recent Pain						
% Neck	36.60%	66.20%	41.80%	39.20%	56.60%	44.10%
% Shoulder	39%	66.20%	43.80%	37.90%	40.20%	38.50%
% Wrist	26.60%	47.60%	30.35	16.70%	24.40%	18.90%
% Hand	27.10%	45.90%	30.40%	21.40%	27.50%	23.10%
% Low Back	48.70%	50.70%	49.10%	53.70%	62.20%	56%
% Knee	33.70%	45.50%	35.80%	32.20%	36.60%	33.30%
% Foot	30%	46.20%	32.80%	36.70%	34.60%	36.10%
Days Absent in Past 4 Weeks						
Mean (sd)	0.94 (2.82)	1.62 (3.49)	1.08 (2.96)	1.38 (3.2)	1.73 (3.2)	1.47 (3.19)

DOC

Functional health outcomes

Figure 1 below, associating ↑BMI with work tenure in the HITEC DOC cohort, highlights another dimension of this high-risk profile. During the HITEC I observation period, the crude death rate of COs aged 30-49 was 106 per 100,000, three times the average for the age-equivalent State of Connecticut workforce. This finding, plus the baseline observations on the health of DOC personnel in Table 1 (above), is alarming, because COs enter employment following physical and mental health screening and a rigorous physical fitness program at the training academy.

Figure 1. Mean body mass index (BMI) of DOC correction officers, by year of seniority.

Mean BMI
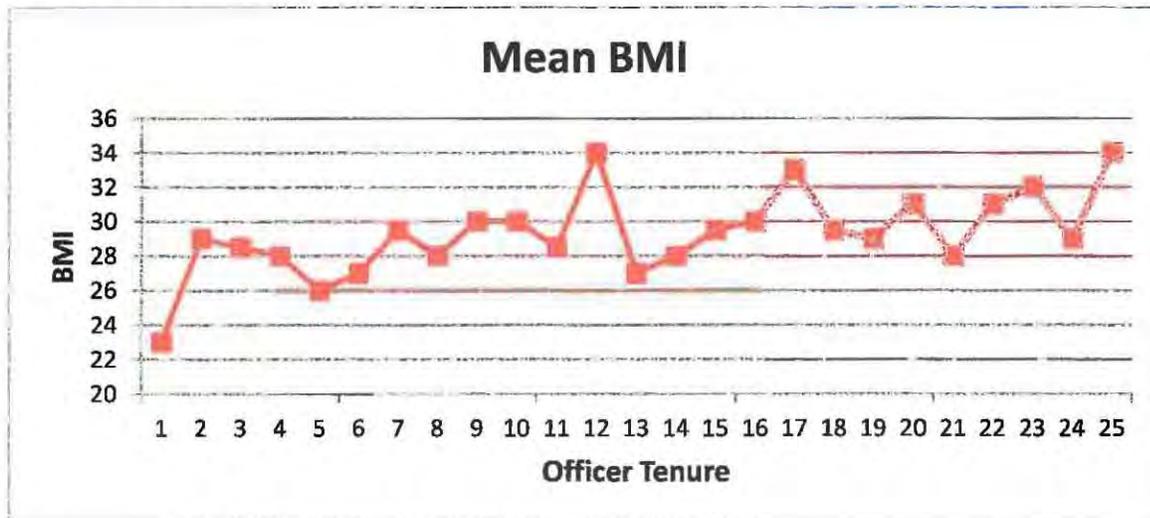
Qualitative Methods

Findings on the DOC workforce based on focus groups included extensive concern over lack of access to nutritious and low-fat food and time constraints affecting both exercise and healthy eating [Morse et al. 2011]. The importance of shiftwork, job rotation and working overtime were also highlighted, as was the impact of stress and boredom on over-eating. Other barriers to fitness and exercise included prison security and management concern about workers' compensation liability from use of fitness equipment at the facility. Obviously these issues are compatible with the measured high prevalence of obesity.

Pratt and Whitney

Baseline Health of Workforce

HRA results indicate high levels of chronic disease but also relatively high levels of treatment. However, the self-report presents a potential bias against untreated or incompletely treated disease. This is suggested in the measured BP, where only 5% describe untreated disease, but 33% were hypertensive during physical evaluation (Figure 2). Similarly, the high prevalence of musculoskeletal disease and of back problems is not reflected by the indicator of physician visits.

Figure 2.   **Personal Medical History--MD Diagnosed Conditions**
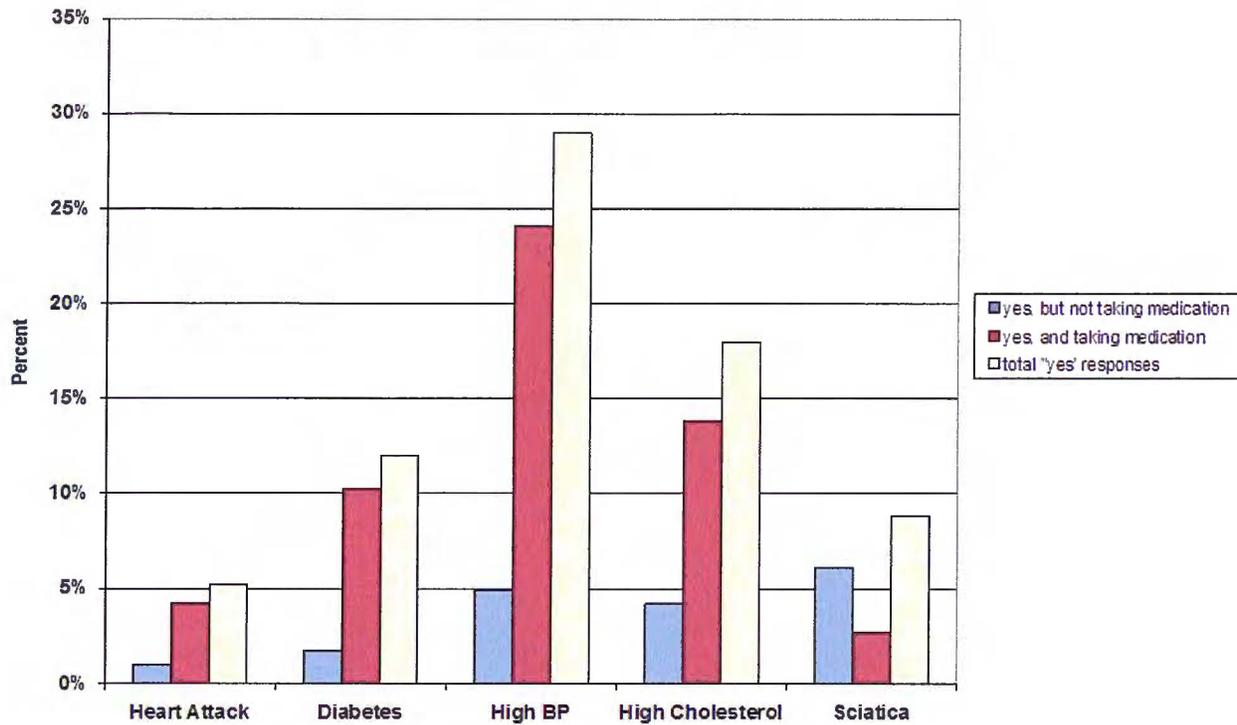
All examined Pratt and Whitney employees in the 2008-2009 baseline were compared to age-specific national BMI norms, determined from NHANES (Figures 3a, 3b. For all age groups, P&W men exceeded national norms for being overweight or obese. For women, the 20-34 year-old age group was less obese than the national norm. However, the group was heavier than the national comparison group for all older age groups. Being overweight or obese in excess of national norms appeared quite stable in comparison with national norms across six decades of employment.

Figure 3.a.

BMI by Age (Males): Pratt vs. National
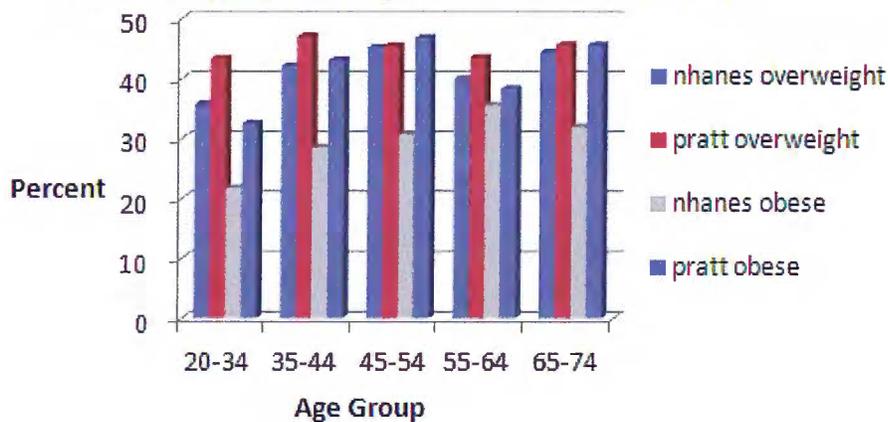
Figure 3.b.

BMI by Age (Females): Pratt vs. National
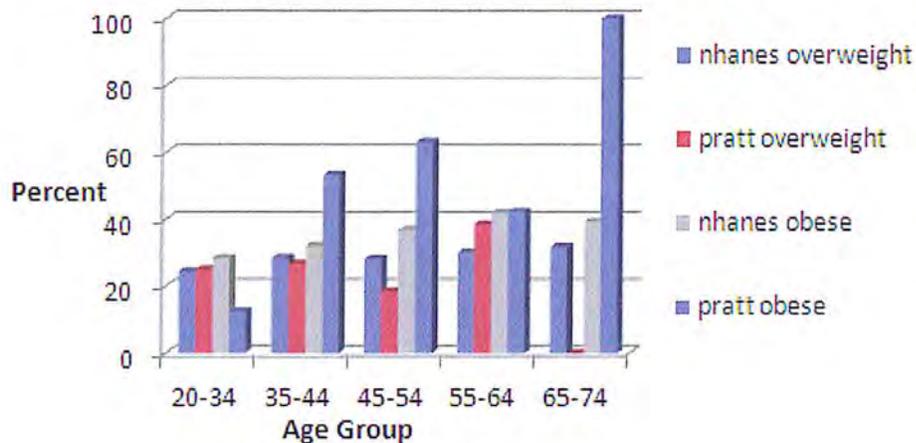
Qualitative Methods

The following table lists main themes appearing in focus groups prior to the closure of sites and re-organization of facilities. It was apparent even before the indication of lay-offs that there was a great deal of suspicion towards management's motives and skepticism about the effectiveness of participatory ergonomics teams.

Working Population

- Workers are getting older
- Death after retirement is on worker's minds
- Concern about cancers after retirement

Ergonomics/Workplace Design

- Poor air quality
- Earplugs are uncomfortable
- Building either hot or cold
- "Body Mechanics" specialist to look at tools
- New tools never arrive
- Have to get injured before anything will change
- Inspectors get interrupted all the time
- Everything is not taken into consideration when building
- Ergonomics teams accomplish nothing
- Work on cosmetics of worksite instead of ergonomics
- Can take months for a change
- Water coolers are never cleaned
- Sometimes have to search for tools
- Allergies from workplace environment
- Eat and cook in unsafe areas at worksite

Diet & Exercise

- Lack of time to exercise
- No healthy food in vending machines
- Half-hour for lunch
- Workers are not concerned about physical health
- Can't exercise because of long work day

Scheduling Issues

- No engineers on Sundays
- Weekends are short staffed
- 12-hour day, plus a long commute
- No break from 5am till lunch
- Hard to sleep-in on off days
- Hard to sleep after work, need to unwind first
- Have to wait for parts
- Disconnect between shifts
- Flex shift makes things more ideal
- Flexibility is being taken away
- No sympathy for family life from management

Broken Equipment

- Computers don't work
- Fire extinguishers
- Most equipment is old
- Machines don't get maintenance till they break down

Psychosocial Environment

- Have to meet quota but can't make mistakes
- Interruptions make work harder (meetings, etc.)
- Safety takes a back seat when a part needs to get out
- Lack of communication (email) between workers
- No advice from management about handling long shifts
- No encouragement from supervisors to make suggestions
- Get a reimbursement from Pratt for school
- Hard to work when supervisor changes all the time
- Insecure job future
- Weekends are more relaxed
- Lack of staff, so work is loaded up on people
- Lack of respect
- Stress leads to antisocial behavior
- Cell leaders are arrogant because of higher education
- Leave work very wound up
- Management needs to listen more
- No clear chain of command
- No system of filing concerns/suggestions
- Young cell leaders with no Aerospace experience

- Distrust between workers and management
- Last days of the month are extra stressful
- Management is no sincere
- Toolbox meetings are getting cancelled
- Company is reactive instead of proactive

Issues with Injuries (reporting/return to work)

- Injuries prevent you from being active
- Injuries from being rushed
- 85% of injuries from 15% of population
- Stigma from filing an injury
- Have to report an injury immediately to get worker's comp
- Injuries cost people a lot of money
- Injuries are usually reported
- They may not want you to report an injury
- Carpal tunnel

Suggestions

- Management should listen to workers
- Need time for a nap
- Need to keep inspection and machining areas clean
- People should respect one another
- Rest breaks could relieve stress
- Need improved housekeeping and ventilation
- Hold individuals accountable for breaking rules, not the entire workforce

Ergonomic Job Features

Observers collected 112 15-minute PATH observations, samples at strict 30-second time intervals that characterized upper and lower extremity postural variables, load and grip, motions, and environmental variables. These were grouped by task, and average values were calculated for each task observed.

The following tables show the frequency with which specific body postures and activities were recorded during direct observations. In Inspection, workers stood in one location for the entire day. The trunk was often observed in forward flexion or twisted, and the neck was also frequency bent forward (below: Tables 5.a, b). The grinding tasks were characterized by slightly more walking and neutral trunk posture. However, the upper extremity postures were more often non-neutral (Tables 5.c, d).

Table 5. Ergonomic Exposures in Heavy Rotor Manufacturing: Frequency of specific exposures (% of PATH observations)

e. Trunk and neck postures

	Trunk neutral	Trunk bent 20-45	Trunk bent >45	Trunk bent backwards	Trunk twisted	Arm both neutral	1 Arm bent>60	Arm both bent >60	Head neutral	Head bent 20-45	Head bent >45	Head bent backwards
Grinding	72	17	8	2	29	25	55	20	53	32	0	15
Inspection	51	40	7	3	19	17	17	66	45	52	0	3
Finish Grinding	76	18	7	0	25	27	33	40	67	30	3	0

f. Manual handling

	No load	Holding load	Moving load	Lift/Lower load	Hold load 1 hand	Hold load 2 hands	Stand	Walk
Grinding	87	8	3	3	11	3	85	15
Inspection	19	81	0	0	29	56	100	0
Finish Grinding	41	49	10	0	34	13	83	17

g. Right hand and arm

	No grip	Pinch grip	Full grip	Contact stress	Wrist neutral	Wrist bent >15	Forearm neutral	Forearm rotated >45	Elbow bent <60	Elbow neutral	Elbow bent >120	No weight in hand	>10 lb in hand
Grinding	54	34	12	0	44	56	32	68	3	63	35	88	12
Inspection	21	72	7	7	14	86	68	32	30	29	41	17	83
Finish Grinding	44	21	35	7	40	60	60	40	3	70	27	58	32

h. Left hand and arm

	No grip	Pinch grip	Full grip	Contact stress	Wrist neutral	Wrist bent >15	Forearm neutral	Forearm rotated >45	Elbow bent <60	Elbow neutral	Elbow bent >120	No weight in hand	>10 lb in hand
Grinding	85	13	3	3	72	28	65	35	4	37	59	94	6
Inspection	32	11	58	0	50	50	71	29	43	13	44	34	66
Finish Grinding	29	20	51	12	42	58	47	53	0	60	40	53	34

Aim 1. Creation of semi-independent employee sponsored participant (ESP) groups (subsequently termed 'Design Teams') that will devise a program combining individual health promotion with a corresponding worksite health and safety intervention.

Findings relevant to Aim 1

- Despite being characterized elsewhere as a highly resistant population, COs proved to be highly responsive to participatory health and workplace programs. HITEC demonstrated program feasibility and efficacy.
- The participatory action research (PAR) model took hold in corrections, supported by the construction of participatory structures at the workforce and facility levels, and was considerably more effective than in a large private sector manufacturing firm, where the more gradual cooperatist model of change based on cultural change and combining individual and environmental features seemed to translate less effectively.

Department of Corrections

The Design Team (DT) at Cheshire (participatory site) met regularly for 3 years, generally on a monthly basis with release time arranged by DOC administration and collective bargaining units. A supervisors' DT met for one year but was temporarily disbanded due to extreme short staffing (50% of supervisory positions unfilled). However, a facility specific steering committee and a study-wide oversight committee met at least quarterly, both with representation from supervisory staff and leadership. The set of activities championed by DOC design teams has been determined to be highly successful by both internal focus group evaluation and external review. Successfully completed DT projects are summarized:

1. ***Work Culture: Incivility.*** Largely due to state-mandated harassment reporting, there had been a growing tendency to resolve inter-staff conflict through formal investigation and procedures. The design team conducted a conflict resolution program to reduce outbursts and 'bureaucratization' of conflict. Post-evaluation has shown a significant change in behavior and enthusiasm among the rank and file.
2. ***Ergonomic Workstation Evaluations.*** Prior to disbanding, the Supervisor design team undertook workstation evaluations of the workstations most used by supervisors. They chose this intervention as many of them spent their work hours sitting at a computer terminal and also reported neck and upper extremity pain and discomfort from their work. A study investigator who is also a certified ergonomist provided the team with training. Unfortunately, the team disbanded before any of their recommendations could be acted upon.
3. ***Shoe Insert Program.*** Disorders of the knees and hips and falls while attending to emergencies have been a major source of reported injury and lost work time. There are three issues: smooth floor surfaces (largely a corrections safety procedure), officer conditioning and musculoskeletal health, and footwear. Footwear choice is limited by union contract and State vendor policies. In cooperation with the State's vendor, the design team conducted a pilot study of 3 different insole choices available from the vendor. Twenty (20) officers selected the insole that would best address their individual circumstances based on the package description. After a one-month trial period, 50% (10/20) reported improvement in their symptoms. While this was sufficient for overall improvement and general recommendation, the investigators advised that specialized problems, and the most serious ones, could not be addressed generically. The team is currently calling in outside experts to advise on the next and more specialized phase of the program.
4. ***Weight Loss Program.*** The design team at the participatory site conducted a weight loss program, with assistance from nutrition graduate students. There were 82 registrants, 71

participants, and 16 who completed the program. The participation rate was more than twice as high as a CPH-NEW directed program at the matched professional site. To date, this has been by far the most successful weight loss program undertaken in a CT correctional facility.

Pratt and Whitney

The DT experience at Pratt and Whitney had a more complex but highly instructive history. Initial efforts were directed to enlarging the scope of the joint labor-management ergonomics team into a participatory group that would include WHP. Conceptually, this was intended to accommodate to existing participatory activity rather than inventing a new institution. The elimination of the CARO facility and the restructuring of the EHRO facility altered this basic approach. As noted, because of the top-down managerially introduced changes, the study team elected to concentrate at the 'cell level', small production groups of approximately a dozen workers with programs concentrated in a 3-4 month window.

Ergonomics Team Activities. The ergonomics team took on the role of design team, as foreseen in Aim 1, and was functional for a year and a half. The Steering Committee envisioned in the proposal and defined by an MOU with management deteriorated with the plant closings and job change by key personnel. UConn investigators guided group discussions towards integration of WHP with ergonomics, as an enlargement of the ergonomic team mission. Although interest in health topics was high, integration was largely unsuccessful.

Cell-based DTs. The cell-based design team reviewed results from health and nutrition surveys administered at baseline to all cell members and used their cell-specific ergonomic reviews, prepared by the outside consultant, as a basis for modification by the study team and the ergonomics team. The cell-based approach relied on an intense 3-4 month period of combined ergonomic and health interventions, assayed by a pre- and post-survey. The DTs made a number of integrated observations on changes needed:

- Noise control, particularly on 2nd shift when concentration was disturbed
- Review of air conditioning, particularly given age of the workforce and co-morbidities
- Extension of the high quality nutrition program in the lunchroom to a modified program on the shop floor.
- Integration of exercise facilities to the workplace for time-off recreation.

Although the cell-based program produced useful integrated ideas based and pre and post surveys, there was no vehicle for higher level engagement by managers at the facility and corporate level. The lack of maturation of recommendations paralleled the experience of the established labor-management ergonomics team in its workplace exposure reduction efforts.

Because Pratt and Whitney has an awarded joint labor-management ergonomics team which has been seen as a national model for participatory ergonomics, the HITEC experience is instructive on the strengths and limitations of participatory teams working within large, hierarchical, and compulsory organizations. There was a culture of management 'commitment' in the conventional sense. However, the distances in scale between global corporate institutions and small groups of working teams were formidable, and the gulf between management policy and local operations was very large.

Aim 2. Development of evaluation processes sufficient to compare outcomes from ESP programs to a more traditional wellness and ergonomic programs: the standard of care (SOC) (subsequently termed 'professional').

Findings relevant to Aim 2
- Corrections Officers (COs) had considerably worse baseline health parameters than predicted from normative data. Strikingly, given the entry fitness requirements, adverse health patterns were established in the first 5 years of employment.
- In corrections the top-down best practices approach was much less effective, despite its more extensive content. Similarly, in large-scale manufacturing, small group efforts at WHP and participatory ergonomics were more effective than corporate-wide initiatives.
- In manufacturing, plant lay-offs and closures produced perceptions of poorer health despite WHP and participatory ergonomics. Dramatic top-down reorganizations and the inability of management to incorporate bottom-up work design interventions combined to undermine continuation of the program before the end of the grant period.

The following evaluation metrics were introduced into the HITEC project to compile the data needed for the study Aims. They are described if not self-explanatory.

Metrics:
- Program acceptance –Quantitative
- Program acceptance -- semi-quantitative
- Labor management cooperation-quantitative
- Labor management cooperation-semi quantitative
- Effectiveness of integrating program: DT (Participatory Site)
- Effectiveness of integrating program: Professional Site
- Ergonomics evaluation
- Functional health outcomes
- Ergonomics outcomes/EHRO
- WC costs / utilization

Effectiveness of DT integration of programs: The effectiveness of integration has been evaluated both quantitatively and qualitatively. The quantitative metric is defined as the fraction of design team meetings where integration rather than single axis programs were discussed. Integration was discussed at all DT meetings, although the bulk of attention was paid to health promotion.

Effectiveness of professional site integration: The qualitative evaluation was based on the conclusions of the outside evaluator.

Ergonomics evaluations and outcomes: The same evaluation was completed at the participatory and professional site. A recommendation for outdoor seating at the professional site was rejected by the warden and DOC administration.

Functional health outcomes: Comparative health results on a group basis (repeated cross-sections) and on an individual basis (longitudinal).

Department of Corrections: Intervention Effectiveness

Program Acceptance

Table 6 summarizes the nature of the intervention activities introduced at the Cheshire and Corrigan sites.

Table 6. HITEC Program Comparisons, DOC, 2009- 2011

Program Activity	Corrigan (professional site)	Cheshire (participatory site)
WHP		
HRA counseling	8 baseline recipients followed up	Phone access, no participants
Dietary counseling	On-site student dietician Changes in vending machines No requests for individual sessions	Nutrition survey by design team. Reviewing health food options
Cancer prevention workshops	Attended: <20 participants	None
Healthy lifestyle newsletter	Monthly	None
Weight loss program	Per HITEC Staff N=28	Per HITEC staff and Design Team N=83 (T1); N=24 (T2)
Work Culture		
Incivility project	none	In place by Design Team
Ergonomic Interventions		
Shoe inserts and flooring	none	Design Team project ongoing
Full ergonomic review by HITEC Team	Under review by DOC, warden, and steering committee	To be introduced at Design Team discretion

Results to date indicate shortcomings of conventional survey instruments and recommend a more mixed method approach. For example, mean CES-D scores did not exceed the national norm, but 31% of subjects appeared significantly depressed. Work ability scores were generally very high, but 13%-20% of DOC respondents had very low scores ($\leq$7) per major category.   In a similar vein, survey responses around personal safety predicted <1% of the variance in mental health and job satisfaction. However, in focus groups personal safety was the predominant workplace concern. A significant population seems to be at high risk, but common survey instruments seem insensitive measures for most respondents.

Labor-management cooperation
At DOC, labor-management cooperation occurred on 3 levels: 1) the participatory site Steering Committee, 2) the professional site Steering Committee, and the DOC-wide Oversight Committee. Standing members and preferred meeting schedules were as follows.

Table 7. Description of labor-management committees at DOC sites

	Participatory Site	Professional Site	Oversight Committee
Attendees	Warden, Deputy warden union reps (2) union council rep, non-CO rep.	Warden, Deputy warden union reps (2) union council rep, non-CO rep.	Wardens: 2 sites and Northern; 3 deputy wardens; 5 labor representatives; DOC administration (2). *Deputy wardens by assignment*

Frequency of meetings	Quarterly	Quarterly	Bi-monthly
Attendance	Often limited to warden and one union rep	Currently very active. Periods of dysfunction with new wardens	Usually 100% with direct attendance or designee

The overall labor-management structure worked well through the DOC-wide oversight committee. Discussion was fluid and attendance high. Important issues over inter-union differences (supervisors vs. officer), time set asides for participation, replacement of members, and reviewing DT recommendations were regular agenda items. The labor-management structure at the 2 sites was variable in its effectiveness. Attendance at and effectiveness of the steering committees depended on the availability of the warden and the availability of supervisors. At the participatory site (Cheshire), there was only one meeting in the first six months of 2011, because no deputy warden positions had been filled; the warden, who was highly committed, and the union president met regularly but without a full committee.

Functional health outcomes

Key outcome variables are compared in Table 8. The two physical measures, the SF-12 physical score and the BMI, were unchanged over the 3-year time interval between tests. The SF-12 Mental Score and the CES-D suggested improvement, although there was a large variance in the CES-D result. However, these results mirrored the T1→T3 changes seen in DOC overall. The average SF-12 mental score improved from 48.78 (SD 10.21) to 51.37 (SD 9.51) and the CES-D improved from 7.40 (SD 5.13) to 6.38 (SD 4.99), both significant results. These results are further considered by comparing T1→T3 changes between the sites. There were 41 complete results for the professional site (A, Corrigan) and 43 for the participatory site (B, Cheshire). The differences from the overall total reflect completion of all phases of the testing and retesting.

Table 8. Change in key health outcomes from T1 to T2 (three-year interval), DOC surveys.

Variable Name	T1 Mean (SD)	T3 mean (SD)	Sig (2 tailed)
SF 12 Physical Score	50.73 (5.71)	50.74 (6.33)	0.99
SF 12 Mental Score	49.34 (9.55)	51.68 (8.76)	*0.02*
CES-D	7.42 (4.95)	6.62 (4.82)	0.07
BMI	31.12 (5.03)	31.17 (5.87)	0.87

Perhaps most striking is the development of the high-risk health profile so soon after hiring. At baseline, there were 174 participants (130♂ and 44♀) at Corrigan and 158 (112♂ and 46♀) from Cheshire. At follow-up (T3) there 215 participants (160♂ and 55♀) at Corrigan and 150 (116♂ and 34♀) from Cheshire. It should be noted that an incentive was provided at T3, but not at Time 2 or time 1. At Time 2, there were only 18 participants from Corrigan and 47 from Cheshire. Accordingly, Time 2 results are not shown here. At T3, there were 118 participants from sites A and B who were tested at baseline and returned for a final visit.

Table 9. Change in key health outcomes, by site, DOC surveys.

Key Variable	Comparison Metric	T1→T3 Corrigan % change	T1→T3 Cheshire % change
BMI	Obese (≥30)→non-obese (<30)	5%	12%
	Non-obese (< 30) → obese (≥30)	9%	12%
% Body fat	Acceptable or overweight→ obese	16%	46%
	Obese→acceptable or overweight	27%	19%
Hypertension	Normal or pre-HTN→HTN	37%	21%
	HTN → normal or pre-HTN	43%	31%

Although the results suggest some interesting trends, the number of subjects within groups and the between-category changes were small. For example, three of seven hypertensives at Corrigan and four of thirteen at Cheshire were not hypertensive at T3 after having clinical hypertension at Time 1. Moreover, most participants did not change from their essential diagnostic category over the three years of observation.

Effectiveness of Design Team Interventions

There was a consistent pattern of greater engagement in Site B (the participatory site), with the sole exception of the final evaluation (Figure 4). A $50 incentive was provided and there was an equal number of baseline participants who returned for the Time 3 evaluation from each site.

Figure 4. Participation in DOC programs, by site.
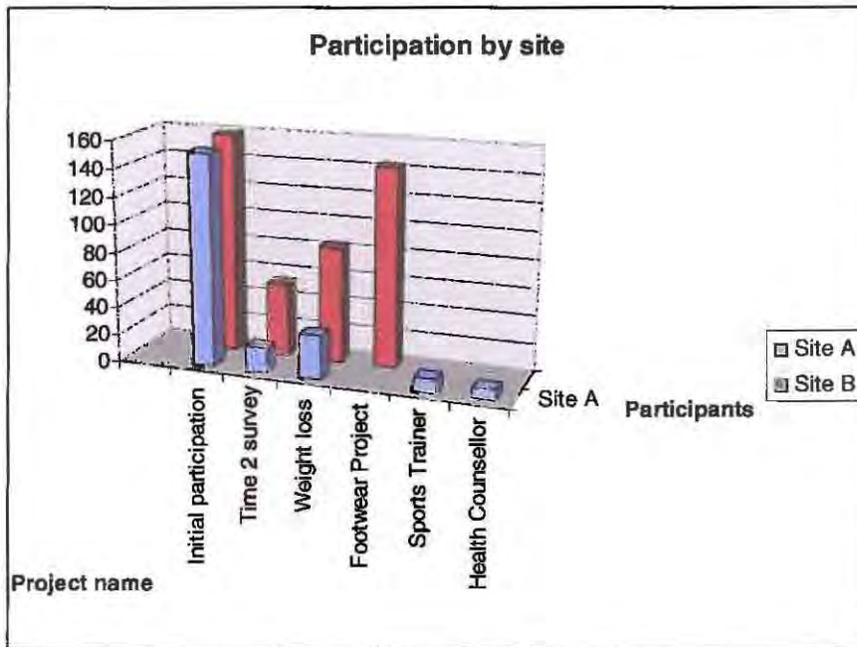
Because more than 25% of employed and eligible participants at participatory site chose not to return for final assessment, the DT did follow-up interviews to assess reasons for failure to respond. The most frequently cited factor was pessimism about the results due to the apprehension that there would be no changes for the positive.

Results from Specific Programs

Structured weight loss programs were offered once at Site A (professional site) and twice at Site B (participatory site), at the request of the design team.   The Site A program involved 32 initial participants with 20 completing the program.   The group averaged one-pound loss/week; eleven lost ≥3%. Overweight/obese participants with healthy waist circumferences increased from 3 to 8 post-intervention. More loss occurred among those, who at baseline, reported lower knowledge/confidence about diet/ physical activity, greater preference for discretionary-calorie foods, yet more accurate assessment of their adiposity. At the end of the 8-week intervention, the average weight loss was 8.3lbs (-1.8≤x≤26.2), an average of 3.6% weight lost across all participants. More than half of the participants (n=11) lost at least 3% of their initial body weight, while 8 participants had less than 3% weight change.

Worker's Compensation Outcomes

There was an observed overall decline in WC claims at both facilities.   Figure 5 tracks the yearly percentage change in new claims, relative to other prisons within the DOC system. It remains unclear if these are long-term trends or program related.

Figure 5. Yearly percentage change in new claims: DOC facilities participating in HITEC, versus other CT facilities.
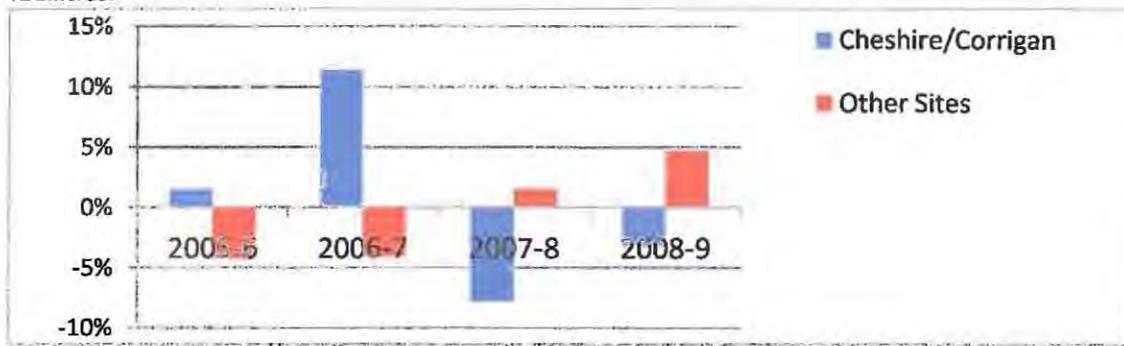
Pratt Intervention Effectiveness

Program Acceptance: Quantitative

Phase 1: EHRO. The closure of the CARO (participatory) and Cheshire (professional) facilities left only the EHRO participatory site, which as the sole functioning site was then sub-divided (see Phase 2). T1 response rate in all 3 P&W locations is reported below. Participation levels of hourly workers exceeded those of salaried workers. Although participation was somewhat lower in the HRA and the physical exam, participation in these activities also indicates considerable employee interest (these rates cannot be broken out by salary and hourly).

Table 10. Pratt & Whitney workforce and participation in HITEC

	EHRO	CARO	CHESHIRE	Total
Total Workforce	474	172	847	1493
Participants	161	48	226	435
% Participating	34%	28%	27%	29%
Participants completing full assessment	131	36	173	340
% Participants completing full assessment	27%	21%	21%	23%

One index of participation is the comparison with Pratt and Whitney's internal health assessment, which had included an online HRA and on-site annual health fair. The internal company participation rate was 20% lower than that achieved in HITEC.

Phase 2: cell-based. These projects also were characterized by high interest and participation. The CTRP project started with a reduced survey and a health survey, followed by intensive, participatory sessions with a single cell (Heavy Rotor), focused on ergonomic and health assessments. Cell members were enthusiastic and participated at high rates in both types of meetings, ending with the productions of intervention recommendations to the CTRP ergonomic team and to the Oversight Committee. There were 4 CTSC and CTRP cells, varying from 9-12 members. 90% completed surveys and 50-90% attended cell meetings. 70 members of the workforce at CTRP and CTSE participated in cell-based interventions.

Labor Management Cooperation – quantitative

Survey results showed high levels of hourly worker trust in EHS management but a general sense of distrust of upper management and its distance from line workers. Employees reported upper management as being out of touch with safety and health needs of hourly workers. They also reported a lack of influence on high-level decisions that affect their lives. During the project span, there were closings of the business units described above, threats of potential layoffs in the remaining business units, and the prospect of difficult contract negotiations. Hourly workers saw all of these as being completely out of their control. When asked what factors would likely lead to loss of employment in the ensuing 2 years, less than 10% cited job dissatisfaction or personal health reasons, but more than 25% cited other factors. As determined by focus groups, these other factors usually meant lay-off. Paradoxically the workers at Cheshire, which had been the most profitable and awarded of the three facilities, were the most confident about maintaining their jobs, but were actually the most affected as the entire facility was closed. Despite the concerns over senior management action at the corporate level, there was a high degree of confidence in line supervisors, as seen in responses to a question about supervisor concern for employee safety (Figure 6, below).

There were, however, many concerns over safety that were directed to overall company policies and production norms, as seen in responses to the following responses to the question of work-safety tension (Figure 7, below).

Figure 6. Pratt: "My Supervisor is Concerned About the Welfare of those under Him/her"
Proportion of Employees in each Response Category
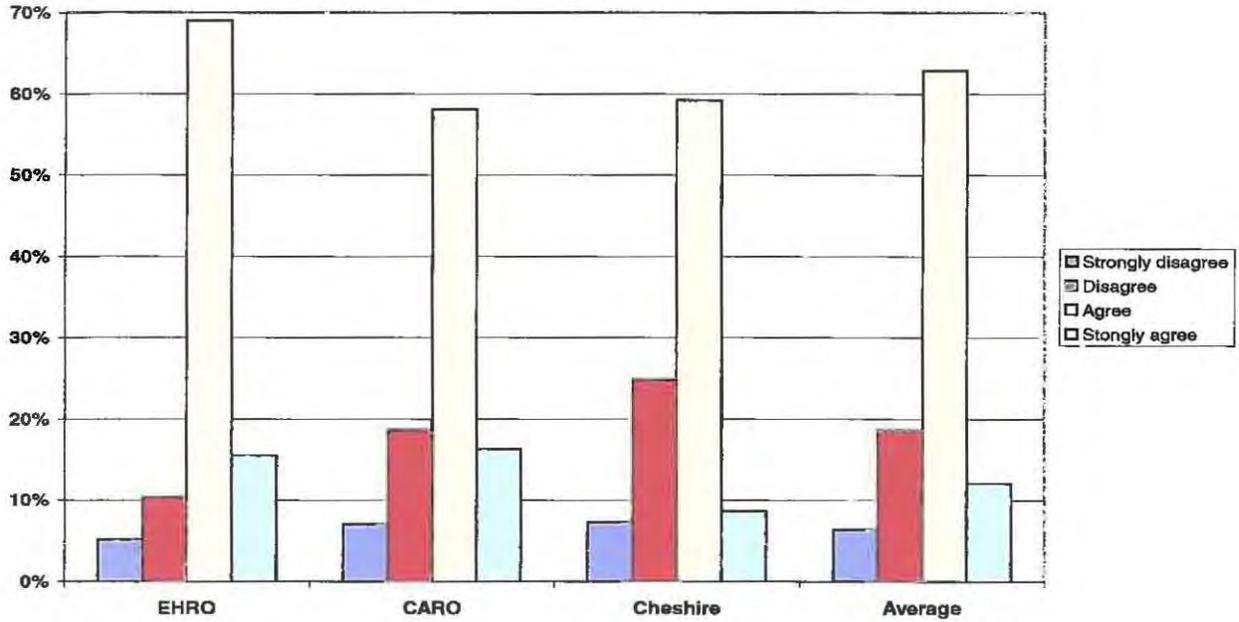
Figure 7. Pratt responses to   **Work-Safety Tension: Heavy Rotor**
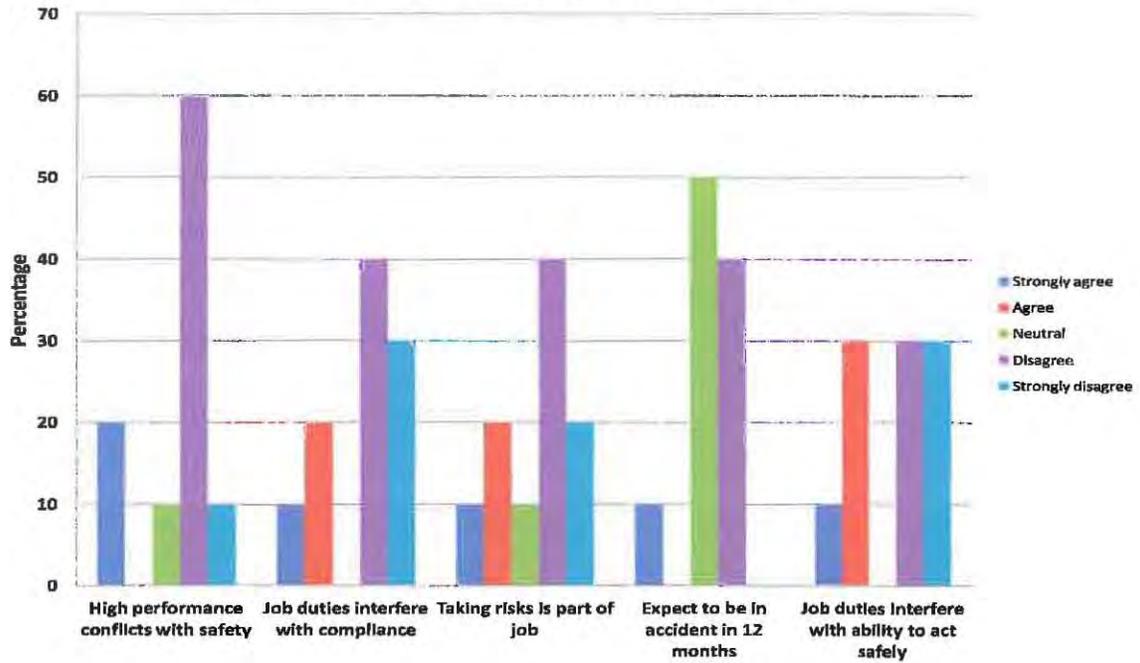
Labor Management Cooperation - semi quantitative
Survey responses were borne out by observations of team function and focus group data. In the cell-based projects, participants interacted well with EHS managers, and they were very sympathetic to cell leaders, seeing this salaried position as being extremely difficult, with competing demands from management and line workers. Cell leaders were generally seen as a resource. The cell-based participatory meetings generated a substantial list of changes; some were new, and some represented long-standing requests to management. Overall employee attitudes are summarized in the following focus-group determined problem areas, ranked by frequency.

Management
1. Proactive rather than reactive approaches needed, i.e. responses to injuries
2. Communication issues & lack of working relationship
3. Respect/trust issues
4. Workers are not consulted before changes are made
5. Inconsistent messages: production versus safety

Social Environment
1. People don't work together, communicate as they could
2. Stress issues (e.g., cannot relieve stress during work; raises accident risk)
3. Job insecurity, financial insecurity and work-family conflict play a role

Scheduling issues
1. Safety takes a back seat during last days of the month; orders must go out
2. No flexibility in scheduling
3. Long periods without a break
4. Work/Life issues (lack of balance, sleep problems after long shifts; stress)
5. Weekend pace and style desirable during work week

Effectiveness of Integrating OH/HP in DT Structure
The ergonomic teams in both project phases did not progress to a project status that would consistently address the integration of OH and HP in intervention plans. Recognition of the need for integration was spotty, and the practical integration was limited by barriers of:
1) Team overload
2) Focus on the ergonomic mandate for the team; HP seemed outside of this mandate
3) Changing personnel of ergonomic team and inconsistent attendance at the ergonomic team meetings
4) The teams never accepted the role of a Design Team. The general team focus was on fire fighting, implementing "hard fixes" (i.e., equipment-based) interventions, and addressing the recommendations of the ergonomic consultant with which they were tasked.

Effectiveness of Integrating Professional Programs
There were no professional programs offered at P&W, because of the closing of the professional site.

Ergonomic Evaluation
PATH evaluations. Presentation of the PATH observations of ergonomic exposures (Table 5, above) to the EHRO ergonomic team was of substantial interest; team members had not previously had access to such quantitative characterization of ergonomic exposures. These data became the basis on which the ergonomic team prioritized jobs for interventions. This technique was detailed enough to guide intervention efforts and clearly involved line workers in the assessment of risk.

Datalogging. The datalogging results were not utilized prior to the division of EHRO into CTRP and CTSC, and the interest of the EHRO ergonomic team in these data dissipated. The EHRO team's interest in the much more detailed quantitative data afforded by datalogging suggested that a quicker and more generalized feedback would have been useful in intervention discussions. The study team required too much time in analysis of results to respond with quick turnaround.

Observation.   The cell-based work with the Heavy Rotor cell relied on structured, qualitative observations of the work process and interviews of workers. This was an approach familiar to ErgoTeam members although it included the addition of the study team ergonomists. Focus group results with the cell-team reflected the following:

1) Disadvantages: Data are more general and vague. Real-time distribution of risk over the task cycles is difficult to develop.
2) Advantages: Analysis of jobs required significantly less time than the PATH characterizations. Although less precise and reliable, these data provided ample basis for discussion of ergonomic exposures and participatory brainstorming about interventions, both at the floor and department level as well as interventions requiring upper-level action and resources. Observations are clearly the simplest tool to promote the PE approach. In addition, the observation/interview technique generates multiple intervention suggestions from the floor, even before formal participatory groups meet.

Ergonomics Outcomes/EHRO

Ergonomic team members were united in expressing disappointment in the methods by which management made changes; they felt that changes were determined at a high level, by individuals or groups who did not understand the specifics of the cell needs. As a result, many interventions were ineffective or had counter-productive results. Team members understand the importance of line worker input into the intervention process, but they were cynical about the ability and willingness of upper management to listen.

Costs of the UConn program
The original proposal to P&W estimated the following costs per employee, all in terms of time:

i. Surveys: <2.5 hrs over 3 years. The T1 surveys and physical examinations took approximately 1 – 1.5 hours. If follow-up assessment takes the same amount of time, this figure will be between 2 and 3 hours. Release time is required for these activities.
ii. Exposure assessment and team meetings: 30-60 min. weekly (adjustable). Because the PATH and datalogging assessments were truncated, due to company instability, participation in exposure assessment was considerably lower than this. Participation in the Design Team (the ergonomic team) took 1 hour of the members' time, but these individuals already had release time for team activities.
iii. Company Coordinator: 4 hr/wk. The EHS manager served as coordinator, and start-up activities occupied considerably more than this time estimate. However, as the project progressed, much less time was required from him. It is estimated that his time averaged out to 1-2 hours/week.

In sum, time estimates were in line with initial estimates and often below. This should not represent an overwhelming burden for the company, given the potential benefits.

Functional Health Outcomes

The inability to do full follow-up has compromised the long-term assessment. However, the cell-based surveys indicate increasing job stress and work dissatisfaction due to loss of sites and employment. Self-assessment of health did not appear to be affected.

Cell-based Approach

Because of plant closures, intervention results are only relevant to the cell-based activities. The overall design was to compare a cell-based approach in the CTRP unit and a broad health and safety committee approach in the CTSC unit. There were 38 participants in the CTRP unit, and 32 in the CTSC unit.

In both groups, musculoskeletal pain level was high and nutrition knowledge was low. Less than 50% reported adequate nutritional knowledge on a standardized food survey.

Intervention effectiveness was limited at both units as there was limited response to study recommendations around workplace design, improved food services, and increased opportunities for exercise at work. Figure summarizes pre- and post-changes at CTSC. Significantly, roughly 20% reported increases in physical and mental difficulty (but 15% also reported a decrease in mental difficulty). Roughly 43% of employees report an increase in job stress, compared to 16% who report a decrease. In focus groups, the most significant cited factor was job insecurity.

Figure 8. Before/after survey data from CTSC unit, Pratt & Whitney.
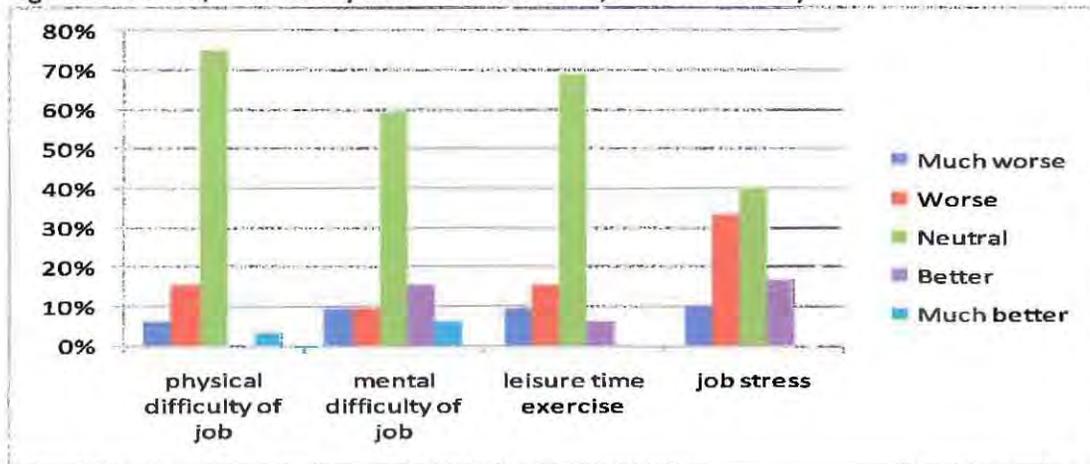
There were similar results for CTRP. There were high levels of physical symptoms in the Heavy Rotor production department, as seen in Figure 9.
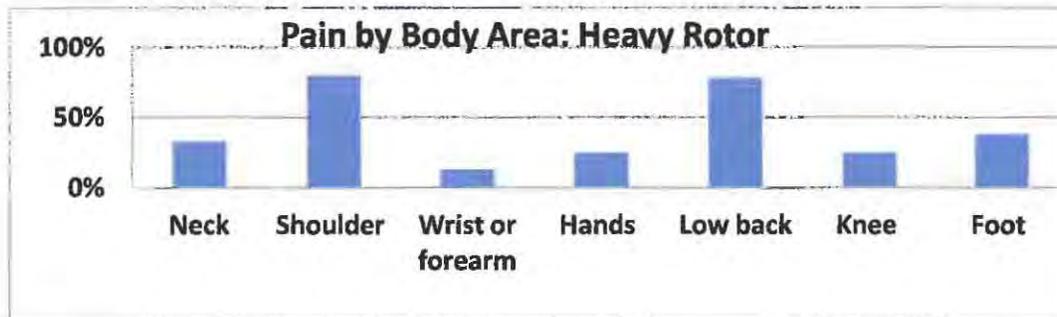
The pattern of injury to the neck and shoulders was consistent with the activity patterns observed on the PATH analysis (below), with the exception that frequent hand activity was not associated with hand and wrist symptoms. Work was craftlike in content and there had been significant ergonomic attention to the design of hand tools.

Exposure Assessment-PATH

The cell-based teams in CTRP developed up with 30 ergonomic and work organization recommendations divided over 8 task areas. There were also 13 health recommendations that came out of the cell-based groups. They included assistance with time management, integrated short workouts, improved food supply and education on nutrition, and weight loss programs.

All recommendations were submitted to senior management. At the time of the post-hoc assessment, there had been no completion of interventions, thus obviating a comparison between CTRP and CTSE.

Aim 3. Development of economic and econometric models for assessing effectiveness, costs, and benefits of interventions, and providing a program evaluation model that is understandable, reproducible, and acceptable to all participating parties, and in particular to insurers and financial representatives.

Findings relevant to Aim 3

- An overall model has been constructed for worker's compensation data. One complication has been an apparent asymmetry between declining utilization at the study sites, but increased overall costs. The reasons are currently being studied. Cost estimates of interventions are still in process.

Because of the dissolution and restructuring of the global medical department and the termination of the medical director position, there was no longer an internal capacity to access summary data at EHRO on either worker's compensation or group health data. This phase of HITEC could not be completed.

Aim 4. Direct participation of the insurance carrier in quantifying costs and benefits, in developing a rate-based incentive structure, in "institutionalizing" the employer's involvement, and in disseminating results.

Findings relevant to Aim 4

- This aim was not met because the insurance carrier was unable to recruit program participants and therefore the study was re-designed to be independent of the insurance company's role. In the original design the insurer's clients were selected on the basis of their responsibility for costs up to a fixed threshold, so that direct cost calculations were possible along with the impact on rates. In the HITEC revision, both Pratt and Whitney and DOC were self-insured, thus obviating a rate-based incentive determination.

The two research companies represent a departure from the original plan to use only Travelers clients, as they are currently insured by a different worker's compensation vendor. For the reasons stated above, Aim #4 no longer applies, although we continue to meet with the Travelers working group for overall program efficacy.

<u>**Conclusions from DOC**</u>

The HITEC intervention study had unanticipated successes with Corrections Officers and within the multiple levels of the Department of Correction in Connecticut. The presence of an active worker- based Design Team, coupled to effective labor and management structures was an important stimulator of participation. Small incentives also contributed to participation. Thus there is evidence for the value of participatory activity in two objectives of Occupational Safety and Health and Worksite Health Promotion. These objectives are participation and engagement and sustainability, although the latter objective requires a much longer period of assessment.

The improvement in objectively measured health parameters was less clear. There appeared to be no significant differences in physically assessed outcomes at the professional and participatory sites, although the participatory site had greater engagement and focus groups suggest a perception of greater health gains.

Nevertheless, HITEC appears to be the most effective preventive health program that involves correction officers that has yet been reported in the United States. The success of the approach should not be underestimated.

Some other assumptions about WHP and program integration were challenged by HITEC results. The extensive effort to recruit Traveler's national accounts client companies and the failure of WRCL scores for workplace readiness to predict willingness to participate were major surprises. A post hoc study, reported in Cherniack et al. [2010], suggests the importance of current economic conditions in discouraging what was perceived as a somewhat altruistic involvement in research. The timing of HITEC was unfortunate from a programmatic perspective. Nevertheless the level of failure, when compared to the unexpected successes at DOC, challenged the conventional wisdom of the study team. The generally unsuccessful programs at Pratt and Whitney, despite a large – perhaps even excessive - and probably non-reproducible effort by the study team, suggests that there is still a great deal that is unknown about factors that lead to engagement in aggressive health interventions. It may be the case that larger corporations, despite greater resources and stated philosophical commitments to workforce health, are often problematic settings for the type of workforce engagement that seems to be the subsoil for effective integrated programs. In the private sector, smaller and more flexible organizations, which see themselves as employee-friendly and see their organizations as innovators, may be better locales for effective and sustainable interventions.

The experience at DOC, if maintained by future research support, has the likelihood of being a useful model for challenged corrections programs throughout the United States. Generalizability may be problematic, but there are overlaps with other public and private sector work milieus. The job is both sedentary and stressful with intermittent physical challenges. There is considerable required overtime and there is a necessity for alertness in an otherwise monotonous environment. There are certainly parallels in the healthcare industry, as an example. The basic denominator appears to be an employer commitment to participation and shared outcomes and a worker commitment to personal and group responsibility.

<u>***Conclusions from Pratt & Whitney***</u>

The closure of key facilities and the reorganization and disengagement of senior management compromised the effort at Pratt and Whitney. Nonetheless, there was evidence for the efficacy of the cell-based approach with its 'kaizen events' type directed interventions involving a limited time framework. The VEHS participatory ergonomics approach was consistent in theory with the HITEC

Design Team model, but its circumscribed authority and focus left limited room for development of new programs, particularly those involving health promotion.

Although the plant closings and management changes were somewhat unique challenges, there were more generalizable factors at work:

1) The ergonomic team saw its primary responsibility as being in ergonomics, with an evident conclusion that health topics were beyond its capacities and allowed mission.
   a) The EHS management chair of the teams was interested in WHP but focused on the ergonomic mandate of the team.
2) The team met monthly and members perceived significant overload.
   a) Prior to the cell-based projects, P&W had hired an outside ergonomic consultant, who provided a somewhat generic list of recommended corrections. P&W used these recommendations to focus intervention efforts, with the EHRO team and subsequent CTRP and CTSC teams being tasked with assigned changes. The HITEC team did integrate its work with these more global corporate charges but timetables and capitalization remained external to the participatory ergonomics team.
3) Attendance at the ergonomic team meetings was not consistent. Prior activities often had to be reprised to include absentees, slowing process and frustrating consistent attendees.
   a) At P&W, repair completion dates were consistently shortened in the setting of continuous lay-offs. Production supervisors were positive but frequently needed to pull workers due to the shortened target dates and diminished size of the workforce.
4) Membership in the teams was also not consistent. As is the case throughout P&W, personnel were constantly changing, with managers and cell leaders frequently arriving and being removed.
   a) The pattern of continuous organizational reassignment was based around restructuring of production units rather than across the facility. Accordingly, there was a recurrent pattern of organizational breakdown and reconstitution. Accordingly, the facility based process of replacement at DOC that involved maintenance by at least one stable tier (bargaining unit/DT/facility steering committee/warden) could not be replicated
5) Overall responsibility devolved upon a single, skilled EHS manager in EHRO. He became the gateway for all projects.
   a) Despite the intent of a skilled and respected upper-middle manager to distribute autonomy and project control, initiative is stymied in the absence of a durable participatory structure that is empowered to engage management.
6) After the last EHRO reorganization, leadership in both ergonomic teams became unstable, exacerbating the difficulty in keeping projects intact.

Despite an adverse labor climate and significant distrust of senior management by the workforce, Pratt & Whitney workers had a very high level of job satisfaction and confidence in their physical and emotional abilities to perform at a high level. The relationships with immediate supervisors were also of a high caliber. Despite the positive assessment of work capacity at the individual level, musculoskeletal symptoms were prevalent in patterns that were consistent with structured job analysis. These results suggested a broad area for structured interventions that could be approached by a future VEHS or 'kaizen event' team.

The workforce was apprehensive over job security and was concerned over the tension between safety norms and senior management directives.

There were elevated levels of obesity and hypertension. While there were considerable cognitive gaps in the understanding of exercise and nutrition, there was a strong interest in improving health behaviors

and many practical suggestions on organizational changes that might positively influence individual health behavior.

The team nature of the contemporary production unit (cell) lends itself to participatory interventions. This fundamental production-driven change in the work environment is currently underutilized.

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List of Appendices

B-1   Protocol for handgrip, mobility, height and weight

Publications

Cherniack M, Morse T, Henning R, et al: [2010] Health promotion site selection blues: Barriers to participation and implementation. Journal of Occupational and Environmental Medicine 52(6):626-34.

> *Addresses Aim 4: It describes the development of a checklist to identify companies for participation in a participatory health promotion program as part of the Health Improvement through Employee Control (HITEC) project, and it sheds light on research-to-practice challenges in workplace health promotion research.*

Morse T, Dussetschleger J, Warren N, Cherniack M: [2010] Talking about Health: Correction Employees' Assessments of Obstacles to Healthy Living. Journal of Occupational and Environmental Medicine 53(9): 1037-1045 10.1097/JOM.0b013e3182260e2c.

> *Addresses Aim 2: describes and evaluates work environment obstacles to health, which need to be addressed by both types of programs.*

Obidoa C, Reeves D, Warren N, Reisine S, Cherniack M: [2011] Depression and work family conflict among corrections officers. Journal of Occupational and Environmental Medicine, in press.

> *Addresses Aim 2: Development of evaluation process for interventions.*

Reeves DW, Walsh BM, Tuller M, Magley VJ. Middle management within corrections: The positive effects of participation in decision making. Criminal Justice and Behavior, in press.

> *Addresses Aim 2: This research study provides empirical evidence for a potential outcome of enhanced participative decision-making: enhanced perceptions of supervisory and organizational support. Increasing perceived supervisory and organizational support are two outcomes that are consistent with building a culture of health within the workplace. Such increases are expected to be associated with the introduction of a PExHP workplace program that is designed to increase employee participatory decision making about the design and implementation of workplace interventions to address health/safety issues/concerns.*

Inclusion of Gender and Minority Study Subjects

Inclusion of gender and minority study subjects: Women and members of ethnic minorities were included in proportion to their presence in the workforces at the study sites. Manufacturing and corrections workforces are overwhelmingly male and white in Connecticut leading to the 23% of females and 12.1% black in the study participants.

Inclusion of Children: Children were not involved in this study; specifically, workers younger than 21 years were not offered survey questionnaires or observed at work for job analyses.

Inclusion Enrollment Report

This report format should NOT be used for data collection from study participants.

Study Title: Center for the Promotion of Health in the New England Workplace (Project B)

Total Enrollment: 1040   Protocol Number: 06-229-1

Grant Number: 1U19OH008857-03

PART A. TOTAL ENROLLMENT REPORT: Number of Subjects Enrolled to Date (Cumulative) by Ethnicity and Race

Ethnic Category	Sex/Gender			
	Females	Males	Unknown or Not Reported	Total
Hispanic or Latino	21	64		85 **
Not Hispanic or Latino	192	661		853
Unknown (individuals not reporting ethnicity)	30	72		102
Ethnic Category: Total of All Subjects*	243	797		1,040 *
Racial Categories				
American Indian/Alaska Native	5	20		25
Asian	4	6		8
Native Hawaiian or Other Pacific Islander				
Black or African American	44	81		125
White	173	626		799
More Than One Race	2	6		8
Unknown or Not Reported	17	58		75
Racial Categories: Total of All Subjects*	243	797		1,040 *

PART B. HISPANIC ENROLLMENT REPORT: Number of Hispanics or Latinos Enrolled to Date (Cumulative)

Racial Categories	Females	Males	Unknown or Not Reported	Total
American Indian or Alaska Native				
Asian	1			1
Native Hawaiian or Other Pacific Islander				
Black or African American	1	2		3
White	3	11		14
More Than One Race	4	40		44
Unknown or Not Reported	12	11		23
Racial Categories: Total of Hispanics or Latinos**	21	64		85 **

* These totals must agree
** These totals must agree

PROCEDURE: HANDGRIP

PURPOSE: To determine handgrip strength.

EQUIPMENT:
1. Skinfold and Circumference Measurement Form
2. JAMAR 5030 J1 Hand dynamometer
3. Non-rolling chair without arms

PROCEDURE

PREPARATION:
1. PRIOR TO TESTING
   A. Allot 5 minutes for handgrip measurements.
   B. Obtain volunteer's research folder.
   C

ACTION:
1. Volunteer should be sitting square in the chair with feet flat on the floor in front of them.

2. Dynamometer size: dynamometer should be placed in hand and adjusted so the palm-side of the grip is at the palm and the front-end is lined up between the joint of the medial and distal phalanges. Observe 2nd metacarpals, they should be flat with a 90 degree bend at the knuckles. Adjust size smaller or larger until position is correct.

3. Record the size, which is measured from the palm handle out (1-5).

4. Have the volunteer bend the elbow at the side, to 90 degrees, not resting against body. The forearm and hand should be in the position of function with the thumb in the superior position.

5. Say the following command: "SQUEEZE AS HARD AS POSSIBLE FOR 3 TO 5 SECONDS. YOU WILL NOT FEEL ANYTHING MOVE WHEN EXERTING."

6. The maximal value is measured by reading the force (to the nearest kg) and recording the kilogram value for each trial in the respective box on the data sheet.

7. Three measurements are to be made for each side alternating left-to-right with a 30 second rest interval between each trial.

8. Use the same handgrip size for all follow-up testing.

FOLLOW-UP:
1. Enter all handgrip values (3 for each side) and left and right hand size. A mean and/or peak value are available for future data analysis.

HAND GRIP

LEFT HAND	RIGHT HAND
SIZE:	SIZE:
1) KG	1) KG
2) KG	2) KG
3) KG	3) KG

Date Data Entered____/___/____   by   (Initials)_____

PROCEDURE: MEASUREMENT OF STRENGTH AND MOBILITY
PURPOSE: To determine range of motion and strength in upper extremities and spine

PREPARATION:
    1. PRIOR TO TESTING
        A. Establish subject identity, consistency with chart identifications, and inclusion of de-identified Physical Evaluation Coding Form – PECF v.1.
        B. Prepare subject in same manner as for BIA
        C. Perform test prior to BIA procedure
        D. All measurements should be done in standing position
        E. Testing is done without shoes and socks

PROCEDURE: Physical Examination and Mobility/Strength Tests for Upper Body

Forward Spine Mobility
    1. Subject stands erect with feet together
    2. Anatomic points are marked with erasable marker at 7th cervical vertebra, at the 10th thoracic vertebra, and the 1st sacral vertebra
    3. Tape measure is pressured against skin beginning at C7
    4. 7th cervical vertebra is located by having the subject maximally flex the neck and palpating along the upper trapezii to the major bony protrusion
    5. 1st sacral vertebra is located on the spine at the midpoint between the two posterior superior iliac spines (PSIS)
    6. 10th thoracic vertebra is approximated by a point 10 cm above the 1st sacral vertebra
    7. Record distance in cm (to nearest 0.5 cm)
    8. Repeat measurement with knees unbent and trunk maximally flexed

Functional Reach Test
    1. Subject stands erect with feet apart, 12 inches from wall
    2. Yardstick is placed at humeral head
    3. Shoulder is at ~ 90° flexion with fists clenched
    4. Subject instructed to reach forward parallel to yard stick, without scapular protraction or stepping
    5. Perform 2 practice trials, and 3 regular trials
    6. Record to nearest 0.5 cm
    7. Advise subject to restrain themselves against wall in the event of falling forward

PROCEDURE: MEASUREMENT OF HEIGHT, WEIGHT AND WAIST CIRCUMFERENCE

PURPOSE: To determine height in a reliable manner

EQUIPMENT:
1. Data Form
2. Anthropometer
3. Balance

PREPARATION:
1. PRIOR TO TESTING
   A. Establish subject identity, consistency with chart identifications, and inclusion of de-identified Physical Evaluation Coding Form – PECF v.1.
   B. Prepare subject in same manner as for BIA
   C. Perform test prior to BIA procedure
   D. All measurements should be done in standing position
   E. Testing is done without shoes and socks
   F. Balance should be located on level firm surface
   G Weights on balance should be non-detachable

TESTING ACTIVITY: HEIGHT
1. Subject should stand with back straight and eyes focused straight forward
2. Feet, knees, buttocks and shoulder plains should be in contact with vertical anthropometer
3. Palms should be in neutral position with arms relaxed and head in contact with vertical surface
4. Subject should take a deep breath and stand at maximum height
5. Tester should mark contact of headboard with crown of head
6. Result should be recorded to nearest fraction of cm.
7. *If large amounts of adipose tissue prevent the heels, buttocks, and/or*
   shoulders from touching vertical surface simultaneously,
   subject should simply be asked to stand erect.

TESTING ACTIVITY: WEIGHT
1. Scale should be at zero balance prior to test
2. Patient should stand unassisted, looking straight ahead
3. Patient should stand still without deep respirations
4. Results should be measured to fraction of kg.

TESTING ACTIVITY: WAIST CIRCUMFERENCE
1. Locate iliac crests and place tape measure evenly over the bare abdomen or a thin layer of clothing
2. Tape should be snug but without skin indentation
3. Advise patient to breath lightly and not to "suck in" the stomach
4. Obtain measurement to the nearest 0.5 cm during resting exhalation

PROJECT C: Education, Translation, Communication, Dissemination Project
"Workplace Stress and Cardiovascular Diseases: Education and

Outreach to Health Professionals"

Grant Number 1U19 OH008857

Grant period: July 1, 2006 to June 30, 2011

Report Date: November 18, 2011

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List of Key Terms and Abbreviations

CDC: Centers for Disease Control and Prevention
Co-PI: Co-Principal Investigator
CPH-NEW: Center for the Promotion of Health in the New England Workplace
CT: Connecticut
CVD: Cardiovascular Diseases
DPH: Disease Prevention/Health promotion
EAP: Employee Assistance Professionals
EAPA: Employee Assistance Professional Association
EC: Executive Committee
HITEC: Health Improvement through Training and Employee Control
HP: Health Promotion
HP-OSH: Health promotion- Occupational Safety and Health program integration
MA: Massachusetts
MDPH: Massachusetts Department of Public Health
MNA: Massachusetts Nursing Association
NIOSH: The National Institute for Occupational Safety and Health
OHS: Occupational Health and Safety
OSH: Occupational Safety and Health
OSHA: Occupational Health and Safety Administration
PPT: PowerPoint
R2P: Research-to-Practice
RI: Rhode Island
UML: University of Massachusetts Lowell
WHI: Worksite Health Improvement
WHIS: Worksite Health Improvement Survey
WHP: Worksite Health Promotion
WW: Working on Wellness
YR1:   Year 1
YR2:   Year 2
YR3:   Year 3
YR4:   Year 4
YR5:   Year 5

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Abstract: Workplace Stress and Cardiovascular Diseases: Education and Outreach to Health Professionals

Cardiovascular diseases (CVD)—in particular stroke and coronary heart disease—kill more people in the United States than any other disease, including all types of cancer combined. Stress has been shown to adversely affect the cardiovascular system, and numerous studies have shown that the workplace is a significant source of stress and a positive association exists between workplace stress and the occurrence of acute and chronic cardiovascular events. Public health efforts designed to reduce CVD risk factors, should include as an essential component an emphasis on workplace stress, and yet, this is rarely accomplished. With scant literature to explain this gap in practice, this project aimed to identify knowledge and perceptions of a wide range of health professionals related to job stress, and to design and deliver an appropriate educational curriculum to stimulate increased clinical and public health focus on this issue. A secondary project goal was to identify opportunities for broader integration and collaboration between occupational safety and health and chronic disease prevention within state public health structures.

Interviews with a wide range of health professionals (including nurses, cardiologists, employee assistance professionals, worksite wellness coordinators, and public health program managers) were conducted to better understand their knowledge, interest, and perceptions about job stress and CVD. Several important barriers to and opportunities for adopting job stress interventions along with broader CVD risk reduction efforts were identified. Key barriers included knowledge gaps regarding work organization hazards and primary prevention through organization level interventions; structural barriers (contracted and "in-house" employee health practitioners often lack of access to organization decision makers); lack of stress-disease evidence to make a business case for new interventions; as well as perceptions about powerlessness to overcome work organization stressors driven by macroeconomic forces. Key opportunities included partnering with the state health department and with key professional associations that shared a mutual interest in CVD, stress, and depression.

Customized educational curricula were developed for health professionals concerning 1) the definition and efficacy of health promotion-occupational safety and health program integration (HP-OSH), 2) the relationship between work-related stress and the development of heart disease and stroke, and 3) HP-OSH intervention approaches for reducing risk for CVD and other chronic illnesses. These content areas also formed the basis of a "Stress@Work" educational website that was pilot tested with practitioners and content experts.

Cross disciplinary partnerships were established with Occupational Safety and Health (OSH) and Chronic Disease prevention units of the state health department in Massachusetts and Connecticut, as well as with nursing and employee assistance professional associations in the region. Collaboration with the MA heart disease and stroke prevention coalition and a state worksite wellness capacity-building program were particularly effective vehicles for increasing job stress awareness among health professionals for introducing the concept of systems-level job stress interventions to practitioners in workplace settings. Evaluations from program participants and organizational partners alike indicate strong interest for additional tools and training to support interventions aimed at reducing work-related stress.

Project C Section I

<u>**Highlights/Significant Findings**</u>

Project C activities were designed to increase health professional knowledge about the role of job stress in development of cardiovascular diseases (CVD) with the hopes that they would be better equipped to diagnose stressful working conditions and provide recommendations to reduce exposure to those conditions in their patients. Interviews with health professionals (nurses, cardiologists, employee assistance professionals, worksite wellness coordinators, and public health program managers) were conducted to better understand their knowledge, interest, and perceptions about job stress and CVD. Interview findings were then used to develop customized educational curricula for health professionals concerning 1) the definition and efficacy of health promotion-occupational safety and health program integration (HP-OSH), 2) the relationship between work-related stress and the development of heart disease and stroke, and 3) HP-OSH intervention approaches for reducing risk for CVD and other chronic illnesses. Curriculum content was delivered in several formats---live presentations for professionals (about 900 health professional participants); a "Stress@Work" website (pilot tested by public health and clinical professionals); and a web-based, self-study, continuing education module that will be produced and promoted through CPH-NEW's future outreach activities.

Although health professionals theoretically could play an important role in diagnosing serious work related stress exposures and assisting patients with education and problem solving, our qualitative studies uncovered several barriers that challenge the feasibility of this concept. For example, lack of knowledge about work organization issues and interventions was perceived as an obstacle in health professionals' ability to design appropriate education and programs. This finding points to the need for incorporating OSH and HP content into professional training programs. However, providing job stress intervention training for health professionals, while important, may not result in actual implementation of interventions in the workplace because of key structural barriers identified by many practitioners we interviewed. Barriers cited include lack of clinician presence in company settings, lack of practitioner access to company managers due to outsourcing of HP and OSH services, and practitioner perceptions about their powerlessness to overcome work organization issues driven by broader economic forces or to redesign (or to "prescribe" changes to) any aspect of the work environment.

A secondary project goal was to identify opportunities for broader integration and collaboration between Occupational Safety and Health (OSH) and Chronic Disease prevention within state public health structures. Project personnel have established strong and visible collaboration with state public health programs in chronic disease, wellness and occupational health. Some of the products of collaboration were a jointly designed and conducted employer survey on health and safety practices, and an employer training presentation on organizational stress reduction strategies. (Both products can be accessed at www.mass.gov/massinmotion.) CPH-NEW participation as a lead partner organization of the statewide heart disease and stroke coalition was very effective for raising awareness about the role of job stress among a wide range of health professionals, while providing visible focus on the worksite setting as part of a major statewide public health campaign.

Translation of findings

These findings of this project offer several lessons that can be applied to improve health in the workplace. These include the following recommendations: 1) augment health professional training curricula with work environment and disease prevention content; 2) direct future educational outreach to corporate consumers of health and safety services to increase their focus on comprehensive systems approaches to workplace stress reduction; 3) develop stress reduction educational materials for employers that are easily understood and offer specific actions for uptake by a range of company stakeholders; and 4) design a management level outreach/dissemination strategy that focuses "upstream" to reach decision makers with the goal of influencing the design of employee health policies, programs and services. Future policy and program evaluation research with employer groups, insurers, and providers of health promotion-occupational health and safety services would be valuable for demonstrating the business case of the HP-OSH intervention approach. Taking a broader public health view, worksite stress reduction as a content area can very successfully be incorporated into public programs that focus on disease outcomes of mutual interest such as heart disease and stroke, mental health, or worksite wellness more generally.

Outcomes/Relevance/Impact.

CPH-NEW Outreach, Communication, and Dissemination activities advanced knowledge and awareness of job stress as an important risk factor for cardiovascular disease and other chronic diseases among a broad range of Massachusetts health professionals focused in workplace, public health, and clinical settings. A newly developed website, "Stress@Work," provides information for employers, health professionals, and the public at large about the role of job stress in the development of chronic diseases and intervention approaches that feature systems-level attention to work organization in combination with health promotions.

Qualitative studies with a wide range of health professionals identified several important barriers for adopting integrated (combined) HP-OSH intervention approaches as part of broader CVD risk reduction interventions in employer organizations. Key barriers include those that are structural (employee health services often contracted by third parties and/or not coordinated internally; employee health program managers often lack of access to organization decision makers); knowledge-related (practitioners lack expertise on psychological or work organization issues); and data-related (lack of systematic analysis of health and work outcome data makes it difficult to generate business case for new interventions).

This project also successfully stimulated collaboration between Occupational Safety and Health (OSH) and Chronic Disease prevention within public health structures of a state health department. By identifying disease outcomes of mutual interest (CVD and chronic diseases generally), university researchers were able to successfully initiate cross-disciplinary education activities in both the chronic disease prevention and occupational safety and health programs. Participation of occupational health researchers on the executive leadership a statewide heart disease/stroke coalition resulted in a visible focus on job stress as an important component of a statewide heart disease public health campaign.

Scientific Report

Background

Cardiovascular diseases (CVD)—in particular stroke and coronary heart disease—kill more people in the United States than any other disease, including all types of cancer combined. Stress has been shown to adversely affect the cardiovascular system, and numerous studies have shown both that the workplace is a significant source of stress and that there is a positive association between workplace stress and the occurrence of acute and chronic cardiovascular events. Quite clearly, organized public health efforts designed to raise awareness of the problem of CVD and to spur concrete action to prevent it, should include as an essential component an emphasis on workplace stress.

Ideally, if a stressful job is part of a diagnosis, the clinical practitioner would "prescribe" a decrease in the amount of exposure to stress-related health risk factors on the job. However, clinical interventions on workplace activities are not a routine part of clinical practice. In the United States healthcare system, clinical healthcare treat the patient but not necessarily the environmental threats to the health of the patient. Physicians treat specific illnesses, prescribe medications, and advise patients on personal lifestyle changes—quitting smoking, improving diet, exercising. (Public health professionals, for their part, while often dealing with large cohorts, have not traditionally made the workplace an area of their practice.) However it is also true that when there are indications to address the patient's work status (for example, pre-filled forms including occupational issues) the rate of inclusion of occupational status increases (Politi, 2004).

In addition, when a "contextual" or behavioral diagnosis is made, interventions tend to be led by other professionals and not by the clinician who treats the main disease. In many cases these professionals are not part of the clinical practitioner group. So, family interventions are accomplished by social workers, psychotherapy by psychotherapists, exercise by the physical therapist, and so on.

Drawing on the above discussion, two difficulties are apparent. First, there is currently no generally accepted method of diagnosing a stressful job within the clinical setting. Second, there is no easy way to prescribe a decrease in the exposure to work stress. The search for avenues to address these difficulties has been a key purpose of this project.

In light of the voluminous evidence on epidemiologic and physiological links between work stress and cardiovascular and other chronic diseases, an almost obvious question was to ask why cardiovascular diseases are not usually considered by physicians as work-related. One factor that might explain this gap could be lack of dissemination of the research evidence that has been generated to date (Burstein and Levy, 1994). Another possible factor might be that the evidence is epidemiologically real and, simultaneously, clinically irrelevant. It is possible that healthcare providers might perceive the existence of a link between work stress and a patient diagnosis but not transform that understanding into an intervention that would benefit the patient. There are other professionals who may have more access to the workplace where changes are needed and who have more understanding of the specific types of job features that cause stress: ergonomists, wellness coaches, employee assistance professionals, etc. However, being of lower occupational status than physicians, it is unclear to what extent their knowledge can be translated into effective recommendations for action.

CPH-NEW Outreach, Communication, and Dissemination activities were designed to assess health professionals' knowledge about the role of job stress in development of cardiovascular diseases (CVD) with the hopes that they would then be better equipped to diagnose stressful working conditions and provide recommendations to reduce exposure to those conditions in their patients. There was a lack o literature on broad groups of clinical and other health practitioners (cardiologists, nurses, state public health personnel, workplace wellness coordinators, and employee assistance professionals) regarding

their perceptions of these issues, possible strategic entry points, and suitable educational messages and delivery mechanisms.

Specific Aims

Aim 1. To develop and administer an evaluation instrument to determine the degree of knowledge about, level of interest in, and perceptions of workplace stress and CVD among Massachusetts Partnership members and MDPH personnel.

Aim 2. To create a curriculum on workplace stress and CVD, based on principles of adult health education, initially to be delivered to Partnership and MDPH health personnel, and subsequently to other specific audiences.

Aim 3. To develop and administer an evaluation instrument to determine to what extent the degree of knowledge about, level of interest in, and perceptions of workplace stress and CVD have changed among target personnel as a result of the curriculum presentation.

Aim 4. Development in Connecticut of a pilot 'Partnership' network for provision of the same or revised workplace stress and CVD training and additional evaluation.

Aim 5. To collaborate with MDPH to identify areas of public health activity that would benefit from the inclusion of an occupational health and safety perspective.

Methods and Results by Aim

Aim 1. To develop and administer an evaluation instrument to determine the degree of knowledge about, level of interest in, and perceptions of workplace stress and CVD among Massachusetts Partnership members and MDPH personnel.

Methods

In Yr1, an interview instrument was developed to obtain in-depth qualitative data on cardiologists' knowledge, attitudes, and practices in caring for their patients with CVD related to stress, especially work-related stress (see Appendix C-1). This instrument, together with an interview protocol and recruitment materials, underwent multiple rounds of revision with experts in qualitative research methods, cardiologists, and occupational health investigators.

In addition, a separate interview instrument was developed (see Appendix C-2) and piloted for obtaining in-depth qualitative data from other health professionals, including state public health program managers and Employee Assistance Professionals (EAPs) regarding their knowledge, attitudes, and practices related to workplace stress, its connections with CVD, and their services designed for clients exposed to workplace stress.

In YR2, 8 interviews were conducted with MDPH personnel (program managers in heart disease, diabetes, worksite wellness, tobacco control, women's and men's health programs), 5 with cardiologists, and 5 with EAPs using the interview tools developed in YR1.

In YR3 and YR4, five additional Employee Assistance Professionals were interviewed (for a total of 10). In addition, three worksite wellness coordinators were interviewed regarding their knowledge regarding the relationship between job stress and CVD and their awareness of and preferences about educational materials on this topic.

Summary reports of findings from interviews with Massachusetts Department of Public Health (MDPH), Employee Assistance Professionals, and Cardiologists are provided in Appendix C-3, C-4, and C-1.

Selected EAP findings have been presented in May 2009 at the annual meeting of the Massachusetts-Rhode Island chapter of the Employee Assistance Professionals Association. In addition, interview findings were summarized in the November 2008 issue of CPH-News and Views, a semi-monthly column on emerging topics related to healthy workplaces (see www.uml.edu/centers/CPH-NEW). This article discusses how worksite wellness professionals can address job stress as a modifiable risk factor for heart disease and other chronic diseases.

In YR5, several more interviews were conducted with a variety of healthcare professionals in clinical practice settings, including two nurse practitioners (one with an occupational health background), five registered nurses, four exercise physiologists and one dietician. Practice settings for the health care professionals varied: an occupational healthcare setting in a computer technology company, a primary care office, a cardiac rehabilitation unit, an intensive care/step down unit, a hospital-based community health promotion program which targeted healthy living, and an outpatient cardiac rehabilitation program.

Results of the thematic analysis of interviews revealed an overall general understanding of cardiovascular disease risk in relation to job stress for the health provider's patient populations. The nurse practitioners viewed themselves in a role in which they could intervene to impact the effects of job stress; however the degree of confidence, knowledge and resources with which to address the job stress issue was greater with the occupational nurse practitioner. The nurses viewed job stress as a psychological problem and voiced a lack of education and experience dealing with psychological issues to feel confident and qualified to address stress with their patients.

Although the interview question guide was geared toward the health professional's perception of their patients' job stress and subsequent cardiovascular risks, many of the nurses and other health professionals responded with personal experiences of job stress. Many voiced concerns of de-motivating work environments, a loss of rewarding types of patient-provider interactions, and loss of time to adequately care for and teach patients.

Results

Overview of qualitative study findings:

1. Interviews with health professionals (public health, EAPs, worksite wellness, nurses, cardiologists)

Main themes from interviews:
> High recognition of stress as risk factor for disease
> Low knowledge work organization stressors, and about causal pathways between work stressors and disease
> Perception of work organization as *outside* of HP traditional domain and expertise; lack of knowledge about work organization, workplace hazards, psychological issues and interventions in professional training; low self-efficacy and confidence for addressing work-related issues as modifiable risk factors for chronic disease
> Low time availability in acute care settings (for clinicians); more time availability in ambulatory settings for nurses possibly, not physicians.
> High interest in training/education about evidence-based workplace intervention strategies

Other findings:
> Contracted, third party benefits firms often provide or manage health promotion services for employers, particularly to small and medium size firms. This creates a structural barrier to incorporating/addressing work organization concerns as part of broader workforce primary prevention efforts. [interviews]

➢ Behavioral health is frequently managed via contracted services, usually as part of employee assistance programs. EAP providers usually are not part of the organizational structure, and often are not housed in the workplace. This also creates structural barrier for addressing work organization concerns that relate to health and disease development. [interviews]

➢ Nurses acutely aware of own stressors in healthcare work environment; tended to focus on their workplace when asked about patient interactions related to the job. [interviews]

2. Public health partnerships interview findings

Main themes from public health professionals' interviews
➢ Very little attention to stress in public health programs addressing chronic disease
➢ Very little attention to work environment in public health programs delivering clinical/direct services; beneficiaries viewed as having complex social needs, with working conditions ranking relatively low in the hierarchy of needs.
➢ High receptivity for OHS/HP integration and stress education in public health department programs targeting workplace health with CVD as mutual outcome of interest; successful collaboration was achieved for joint research project, joint outreach/education (Partnership, Working on Wellness)

Other findings:
➢ Employers implementing worksite health promotion programs frequently identify stress as a top health concern, but do not know how to effectively intervene. [MDPH Working on Wellness]
➢ Substantial time investment required to establish participatory labor/management program structures to allow mechanism for assessment and intervention planning to address workplace stressors [R2P toolkit project, HITEC, ProCare]
➢ Occupational health and safety (OHS) programs more common in MA businesses than worksite health promotion (WHP) programs; larger organizations more likely to offer worksite health promotion than smaller firms; correlation between OHS and WHP programs was .366 (weak), although firms offering stronger OHS and WHP programs more likely to report coordination between the two domains; union representation more common in larger firms (32%) than smaller firms (9%). [MDPH worksite health improvement survey]

Discussion

Aim 1 was an essential first step in increasing the awareness to increase health professional (HP) knowledge about the role of job stress in development of cardiovascular diseases. The general lack of awareness regarding the role of work stress in health indicated throughout our interviews was somewhat surprising. However, it became clear that, when educating adults about risks for chronic diseases, the factors of nutrition, physical activity, and tobacco use (commonly referred to as the "big 3") often trump discussion of stress, specifically work- related stress. These evaluation findings reinforce the importance of promoting the concept of the "big 4" (adding stress to the "big 3") when discussing risk factors for chronic disease, and underscore the need for integrating work organization and psychosocial risk factor topics in professional training programs.

Aim 2. To create a curriculum on workplace stress and CVD, based on principles of adult health education, initially to be delivered to members of the Partnership for a Heart-Healthy, Stroke-

Free MA coalition and MA Department of Public Health chronic disease division personnel, and subsequently to other specific audiences.

Methods

In YR1, a literature review of the complex interacting pathways that lead to CVD via workplace stress. A concept map was produced based on this review of the literature. Findings from Aim 1 were used to inform discussions of appropriate curricular goals and modes of delivery.

In YR2, the first educational fact sheet entitled, "Work Stress and Cardiovascular Disease: A Summary of Evidence and Strategies for Prevention" (Appendix C-5) was developed for use by the Partnership for a Heart Healthy and Stroke Free Massachusetts (the Partnership) to help position job stress as a specific risk factor in the development of cardiovascular disease. This fact sheet was posted on the CPH-NEW website as one of several "News and Views" downloadable publications (see www.uml.edu/centers/CPH-NEW). The fact sheet was also included by the Massachusetts Governor's Office (on the recommendation of our MDPH partners) as part of the "MA Workplace Health Improvement Initiative - A Toolkit for the Creation of Workplace Wellness Programs." This resource provides guidelines on conducting quality worksite wellness programs.

Results

Educational Materials

A variety of educational materials were developed and pilot tested in YR3 based on findings to date from Aim 1. Materials were promoted at several meetings (see Appendix C-6 for a complete list of presentations).

- Stress@Work website—this website was constructed by a graduate research assistant as part of the CPH-NEW Center website to provide free, accessible content, links to quality job stress websites, and downloadable printouts for specific target audiences, including company managers, workplace health professionals, employees, and (in future) health professionals caring for patients at risk for (or with pre-existing) CVD. See Stress@work fact sheet Appendix C-7.
- Fact sheets (samples provided as Appendix C4-8 and C-9) were written by an occupational health consultant aimed at three audiences: the "employer" audience citing the business case for addressing job stress on the organizational level, the employee audience, outlining tips for reducing job stress within one's immediate circle (employing some of the "organizational" approaches in the context of one's own work group, department, etc.), and the employee health program planner, focusing on how to advocate for organizational and job design changes in the workplace that will reduce job stress.
- Powerpoint slides (sample provided as Appendix C-10) provide an introduction to job stress, its impact on health, and strategies for intervening at the organizational and job level.

In YR4, the PowerPoint slide set developed in Year 3 was customized and used for several new audiences in Year 4. Evaluation results of those presentations are discussed in results for Aim 3.

Website Development

Content development of the *Stress@Work* website continued through the early summer and early fall of 2009. The content areas for the website were guided by the interview findings from health professionals in previous years, and particularly those practitioners focused on the workplace, such as worksite health and wellness coordinators, and employee assistance professionals. Content was

developed to fill in knowledge gaps about the job strain and CVD association, the mechanisms by which job strain increases risk for CVD, and options for intervention in the workplace.

Several tools were identified as desirable, including fact sheets for employers (making a business case for addressing workplace stress to management, human resources professionals) and employees (describing how to manage personal stress and options for improving social support, decision latitude and skill discretion). Workplace health professionals had indicated that presentation materials would be beneficial for their use within the company, and that an on-line resource would be a useful addition to company intranet sites for employees. The website incorporated all of these elements, as well as providing links to many other resources for technical and non-technical audiences.

The *Stress@Work* website was pilot tested during summer and early fall of 2009 (see Aim 3 for evaluation details) and the launched in October 2009— http://www.uml.edu/centers/cph-new/job-stress/default.html. The launch was publicized through our Center affiliates and partners as described below. The visitor count to the main page increased from 122 in October to 316 in November, with numbers steadily holding in the 100's in the months following. However, in January and February 2010 (the most recent available) the visitor numbers increased to about 1700 and 1100, respectively.

Stress@Work publicity activities:

University of Massachusetts Lowell online and print publications: School of Health and Environment Newsletter (1,800 faculty, staff and alumni); ENews, the UML web site newsletter (public); UML Today—internal electronic newsletter; UML NewsLine paper newsletter—4,000 university leadership partners, including local leaders, state legislators.

Email announcements circulated to our CPH-NEW mail list of 200, including attendees of all project presentations and contacts for distribution within partner organizations such as Massachusetts Department of Public Health (Chronic Diseases Division, Wellness Division, and Occupational Health Program), Partnership for a Heart Healthy Stroke-Free Massachusetts coalition, and Massachusetts Rhode Island Chapter of Employee Assistance Professionals Association.

Links to *Stress@Work* website were posted on several of our partner organizations website also. These include Society of Occupational Health Psychology, Massachusetts Nurses Association, Mass in Motion (the state wellness website), and Partnership for a Heart Healthy, Stroke-Free MA.

In YR5, a new initiative for outreach and education commenced, based upon conversation with the Massachusetts Nursing Association (MNA). A module was developed for registered nurses that would provide continuing educational credits. The module would be offered through the MNA's existing online learning programs, available through their website. Content focuses on job stressors specific to nursing and the healthcare work environment, with a focus upon the longer term health impacts taxed sector of workers. It also includes strategies to mitigate the ill effects of stress at both the individual and organizational levels.

In July of 2011, the MNA informed CPH-NEW that they no longer had the resources to translate the content we developed into an online offering. However we are preparing to offer a half-day, face-to-face training to MNA members in the spring of 2012. In addition, we are exploring other ways we might translate the content we developed for the MNA into an online program for nurses.

A complete list of presentations and trainings offered to clinical and public health professionals is summarized in Appendix C-6.

Discussion

Aim 2 served as the backbone of the Stress@Work dissemination and outreach activities over the course of the 5 year project. Upon gathering critical information regarding health professionals general awareness of the connections between work stress and health (as discussed in Aim 1), it became clear that there was a great need to expand our audience beyond health professionals to also educate employees and employers about the physiological, behavioral, and psychological implications of exposures to work related stress. It was only then that we could begin the dialogue about going beyond individual or personal strategies to help cope with these stressors. Participants were intrigued about learning how organizations or workplaces could act to reduce or eliminate works exposures to stressors in the workplace. It was especially clear that these messages were critical for the management to hear and react to, since they were perceived to be in key decision-making positions to implement some of the organizational strategies to reduce job stress, such as flexible work schedules, involving employees in decision making that affects them, and assuring quality relationships and effective supervision and leadership within all levels of the organization.

Aim 3. To develop and administer an evaluation instrument to determine to what extent the degree of knowledge about, level of interest in, and perceptions of workplace stress and CVD have changed among target personnel as a result of the curriculum presentation.

Methods

In YR3, project personnel developed an evaluation form (sample provided in Appendix C-11) for use when giving presentations. The form measures whether learning objectives were met for knowledge about a job strain as a risk factor for CVD, and awareness regarding work organization interventions. The form also measures how the participants will use the information in their work setting, and what additional support they needed to apply the information locally.

The evaluation tool was effective in attaining people's reactions to the content and overall receptivity to the message. Below are results of evaluations from three key Stress@Work sessions.

Results

In YR3, a 90-minute presentation was given to an audience of over 50 Employee Assistance Professionals at the annual symposium for the MA/RI Employee Assistance Professionals Association. Objectives for the session were to empower participants to: explain the impact of job stress on risk for CVD, describe the challenges associated with addressing work organization and/or culture to achieve a healthier work environment, and evaluate several strategies for reducing job strain at the organizational level. Three quarters of respondents (N=22) agreed that all three objectives had been met by the 90 minute session. Approximately 87% of participants said they planned to integrate the information into their employee counseling sessions and that they would present the information learned in the session to management to gain support for company-wide stress reduction efforts. Common barriers for implementing organizational strategies to control stress include: cost, time, lack of access to decision-makers, a lack of a clear return on investment for addressing stress at the institutional level, and contracted EAPs not having a strong understanding of company culture.

Also in YR4, two 1-hour presentations were made to an audience of over 75 nurses at the annual Massachusetts Nurses Association Workplace Hazards Conference. Objectives were the same as those listed above. Eighty-five percent of respondents (N=56) reported the objectives being met. Approximately 95% responded that they agreed or strongly agreed that they learned something new in the presentation and that the content presented was relevant to their practice. Common barriers for

implementing institutional strategies to control stress in their workplace overwhelmingly referred to management being disconnected from the employees and not listening to the suggestions made by the nursing staff, a lack of training for people in supervisory roles, and a lack of communication, time, and money to address the concerns of employees. In April 2010 one participant from the presentation (a senior level health and safety director from a large health care system) approached Principal Investigator Champagne to consider future collaboration on workplace stress reduction and health promotion intervention for hospital employees within their system. During Year 5 several presentations for employees of 3 hospitals within their system were delivered by project personnel on the topic of stress and cardiovascular disease. Future collaborations are anticipated as this represents an important signal demand to go beyond awareness to actual engagement of workplaces for stress interventions.

In YR5, a presentation entitled "Work, Stress, and Health: Patient Risk Identification and Implications for Patient Education" was presented to a group of 60 participants from the Massachusetts Association of Cardiac and Pulmonary Rehabilitation at the American Heart Association in Framingham, MA. The objectives for the session included: (1) identify potential work related stressors patients may experience, (2) generate 3-5 questions to assess patients experience with work related stress, and (3) identify at least 2 personal and 2 organizational strategies that may be used in the workplace to alleviate stress. In general, the session was evaluated very highly. Eighty-six percent of respondents reported that the content of the presentation met the objectives, and 89% reported the Stress@Work educator was knowledgeable, used appropriate teaching strategies, and was effective in her presentation.

<u>Website Evaluation</u>

In October of 2009 a *Stress@Work* website was launched through a series of announcements through Center affiliates and partner organizations. Prior to the website going live, a content evaluation was conducted (website evaluation instrument provided in (Appendix C-12). A total of 6 professionals with expertise in occupational health or worksite health promotion participated in the evaluation, including 3 CPH-NEW affiliated investigators with expertise in job stress and 3 health professionals and worksite wellness practitioners. Overall, the six evaluators indicated a strong approval of the Stress@Work site. Strengths of the website noted by evaluators included that it was clear, had intuitive navigation, and that it was an effective resource for employers because it provided resources to assess workplace stress and a strong case for why employers should improve or reduce workplace stress. Constructive feedback from experts led to the clarification of material presented, as well as the inclusion of critical information.

An evaluation form was developed by adapting an instrument originally developed by Emory University Rollins School for Public health ("Health-Related Website Evaluation," retrieved from http://www.sph.emory.edu/WELLNESS/abstract.html), which was designed to assist health educators and clinicians to evaluate websites for their clients for health education.

Quotes from health professional reviewers:

"Thank you for the opportunity to review the site. I think it will be a great resource for employers in two ways – provide specific resources to assess work place stress and increase awareness on the importance of improving/reducing workplace stress."

"I found the website to be informative, professionally presented and thorough. The content is well written and appropriate for the lay practitioner as well as professionals in the field of worksite health promotion. I especially liked the links to external sources such as the Stress Smarts quiz."

Discussion

It was clear thought the process of assessment (Aim 1) and the delivery of educational materials (Aim 2) through a number of channels that we were well received in meeting the objectives of our website and educational sessions, as indicated by the various evaluative processes embarked upon by the project staff and conference organizers. Our process of pilot testing materials was effective at assuring the achievement of stated objectives upon delivering the various messages and materials.

Aim 4 Development in Connecticut of a pilot 'Partnership' network for provision of the same or revised workplace stress and CVD training and additional evaluation.

Methods

CPH-NEW investigators met with several organizations focused on chronic disease prevention and occupational safety and health to explore the formation of a cardiovascular coalition similar to the Partnership for a Heart-Healthy, Stroke Free MA organization in MA. A list of outreach presentations and activities are provided in Appendix C-6.

Results and Discussion

Through meetings and presentations with public health part it was determined that although there was interest in heart disease prevention and in job stress outreach and education, the CT Department of Public Health Heart Disease Program did not have the resources to organize and sustain a large scale coalition for this purpose. (The coalition in MA is largely funded through a CDC grant to the MDPH Heart Disease and Stroke Prevention and Control Program. CT DPH was not similarly funded.) CPH-NEW project personnel also explored a formal partnership with the CT Public Health Association for a modified job stress outreach effort, but agency staff turnover made it infeasible to move forward.

Although formal partnerships with CT DPH disease prevention/health promotion programs did not materialize, CPH-NEW collaboration with the Occupational Surveillance Program did produce annual opportunities to make presentations surveillance program personnel from Northeast states who convene in CT every year (see Appendix C-6). Presentations with this group and others have signaled that in CT, job stress outreach efforts may be better directed to private industry networks (such as Chambers of Commerce) and to employer-based Health and Safety committees that are required by state workers compensation laws.

Aim 5. To collaborate with MDPH to identify areas of public health activity that would benefit from the inclusion of an occupational health and safety perspective.

Methods

In YR1, several meetings occurred with personnel from the MDPH Chronic Diseases program to identify possible areas of collaboration and integration of health protection and health promotion programs. Drs. Laura Punnett and Lenore Azaroff convened and presented to cross project and cross departmental state health department personnel who shared a common interest in directing health activities to worksites; this meeting produced leads for follow-up interviews key program managers and stimulated interest for future CPH-NEW collaboration with the state's worksite wellness initiative and the statewide heart disease coalition. New representatives from MDPH were also identified for representation on the CPHNEW Advisory Committee, where similar conversations took place.

In YR2, Collaboration between Project C staff and MDPH were strengthened through several joint efforts. Regular conference calls with the MDPH Coordinator of Worksite Initiatives allowed for the continued discussion regarding opportunities to incorporate the integrated model into worksite based initiatives. Interviews with key public health program leaders from a range of clinical, worksite, chronic disease and occupational health programs were conducted and summarized to more clearly identify opportunities for integration of job stress educational content in MDPH programs.

In addition, Project C staff assisted MDPH in the development of the Worksite Health Improvement Survey to assess existing policies, facilities, and programs that promote health and well being among Massachusetts workers. Project C contributed survey questions as well as gave input on the overall organization of the instrument. The survey was sent in March 2008 to a random sample of businesses in Massachusetts with 50 or more employees. The survey presents a combined, integrated health promotion/occupational safety and health (HP-OSH) approach to assessing traditional health promotion/wellness and occupational health (physical and psychosocial indicators) practices in the workplace. Data from the survey was analyzed by industry sector, size and geography, and shared with Project C staff for our use.

Project C personnel co-chaired a committee to organize a meeting on, "Combined Approaches to Work and Health" on May 6, 2008 (Appendix C-13). Participants will included occupational health surveillance program staff from several states in the Northeast region, plus representatives from chronic disease program personnel in the same states. The goals were to provide cross-disciplinary education, and to stimulate new working relationships within state government infrastructure

In December, 2007 the Co-Chair of the Partnership for Heart Healthy, Stroke Free MA invited the Project C team to designate a person to participate as a voting member of their Executive Committee. In February, Suzanne Nobrega (Project C Co-PI) began attending monthly meetings, with plans to integrate Project C activities appropriately within the Partnership membership and events. In June 2008, Ms. Nobrega was elected to the Executive Committee (EC) of the Partnership organization (comprising over 100 member organizations), and the University of MA Lowell formally joined the coalition as a "Lead Partner", committing to lead a specific objective within the coordinated statewide plan: "To increase awareness about the causal role of job stress in the development of heart disease and stroke." This role formalized Ms. Nobrega's strategic focus on the EC to integrate workplace stress interventions into the Partnership semi-annual educational meetings. Ms. Nobrega continued to serve on the EC through 2011, serving as the EC Co-Chair from July 2009 to June 2011.

In YR3, Project C continued to work closely with MDPH on a variety of efforts including: joint presentations on worksite health improvement survey results and the role of job stress in CVD (see Ounce of Prevention Conference listed below); production and dissemination of a report on Massachusetts worksite practices in HP-OSH; incorporation of job stress educational content into MDPH worksite wellness program educational materials and training presentation materials, and pilot testing of CPH-NEW job stress educational website.

In January 2009, CPH-NEW sponsored and helped to plan the Partnership's annual educational conference with the theme, "Stress: the Forgotten Risk Factor" (Appendix C-14). Job stress was featured as a plenary session (keynote speaker Dr. Peter Schnall) and in a workshop on stress reduction practices in the worksite (Katherine Brooks, HR Director of Green Mountain Coffee— Psychologically Healthy Workplace Awards national winner in the medium, for-profit category). CPH-NEW job stress educational materials were rolled out using an exhibit table at this and all future Partnership meetings.

In late June 2009 Stress@Work materials were be pilot tested with 5 government and non-profit employers participating in a MDPH wellness capacity-building program ("Working on Wellness"). These organizations received technical assistance from MDPH to implement comprehensive wellness programming that emphasizes policy and environmental supports. Repeat presentations were made to

all subsequent workplace wellness training cohorts participating in the Working on Wellness training programs for grant years 3-5. In July 2009, the MDPH 2008 Massachusetts Worksite Health Improvement Survey Report was released to the public; the report can be downloaded from http://www.mass.gov/Eeohhs2/docs/dph/mass_in_motion/worksite_survey_report.pdf.

In Year 4 *Stress@Work* outreach continued through the Partnership mainly through their semi-annual conferences and through the Partnership's website. *Stress@Work* project personnel hosted an exhibit table at two conferences hosted by the Partnership (total 300 participants), displaying posters and distributing handouts focused on the relationship between job strain and CVD and the importance of addressing stress in the work environment. Mugs and take-away tags promoted the new *Stress@Work* website. The exhibit also provided a laptop that played the NIOSH DVD TV production, "Working with Stress" (a 17 minute training video). Exhibiting at this conference and others provided an opportunity to our messages to be seen by all meeting participants, but also to build a mailing list of health professionals who have requested more information about addressing stress in the workplace. We have used this mailing list for announcing news and information about CPH-NEW generally and about new tools available through the *Stress@Work* website as a way of building interest and motivation around our core prevention messages. The Partnership website, www.heartstrokema.org was redesigned during the Year 4 period to offer member organizations their own web pages for the purpose of sharing information with other Partnership members about their heart disease and stroke activities.

Massachusetts Department of Public Health (MDPH) continues to be a major partner for our stress education activities, involving divisions of wellness, occupational health, and chronic diseases. In collaboration with the wellness division, CPH-NEW was able to disseminate information and education about job strain as a CVD risk factor and intervention strategies directly to workplace wellness champions participating in a year-long wellness training and technical assistance imitative called "Working on Wellness." In June and July 2009 Co-Principal Investigator Nobrega delivered two training presentations (Appendix C-15) for approximately 60 participants from 33 worksites on the topic of job stress health impacts and intervention strategies. These presentations were given on site as part of a Working on Wellness training meeting with company personnel who were learning how to plan and implement an effective workplace wellness program. Stress in the workplace had been identified by roughly two thirds of participating companies (based on their local assessments of employee needs and interests), yet none of the companies had begun to address the issue during their year-long in the MDPH training and technical assistance program. Interest in this topic was very high on the part of 6 worksites, which voluntarily came forward to be considered as possible study sites for CPH-NEW's Research to Practice Toolkit project (Project D) which ran concurrent with Years 4 and 5 of the Center grant.

In YR5, CPH-NEW collaboration with public health programs and structures continued in the following areas:

- Education—job stress training was provided for the third cohort of employers participating in the Working on Wellness program. This training will continue for Year 6 of the CPH-NEW Center for the 4th employer training cohort. Additionally we presented at the New England Council on Occupational and Environmental Medicine annual meeting in December 2010 to address stress and other hazardous working conditions within health care and how participatory methods can be used to improve employee controls and empowerment. Thirteen other presentations were made on job stress organizational interventions in Year 5 at professional and scientific conferences, and for employer organizations. This burst of outreach activity is a result of relationship building, and collaboration with public health activities and coalitions that stimulated interest in the job stress topic, particularly given the

increasingly stressful working condition of the recessionary period that developed over the past 2-3 years.

* Research—Project C personnel and Dr. Punnett, together with MDPH representatives, formed a manuscript working group to jointly publish Worksite Health Improvement Survey (WHI Survey) findings in a peer reviewed publication. Research Assistant Patricia Tremblay (UML Masters candidate), under Dr. Punnett's supervision, analyzed the WHIS data set to describe workplace health promotion and health protection practices is greater detail, and with a more nuanced view of how and to what extent employers integrate these two approaches than what was done in the 2009 report for employers (mentioned above in Year 3). A summary of our methods and findings is provided below. See Appendix C-16 for results as outlined in the WHI Survey PPT slide set, which was presented at the 2011 American Public Health Association annual meeting.

WHI Survey Methods—Surveys were administered by the Department of Health in 2008 to worksites across Massachusetts; 890 survey responses were received and included in the dataset. The survey consisted of four sections – general organizational information (size, sector, region, etc.), and organizational policies, programs and practices in the following areas--worksite health promotion, occupational safety and health, and emergency response. Our goal was to describe worksite practices in health promotion and occupational safety and health domains, assess differences based on organization size or industry sector, and correlate these two domains to assess the degree of coordination between them.

Scores were calculated for health promotion and occupational safety and health practices. Two scores were computed in the domain of health promotion—a **health promotion activities score** was computed based on 17 questions about various wellness offerings such as on-site exercise facilities, availability of healthy foods, and offering health risk assessments; a **health promotion administrative support score** was based on 15 questions indicating organizational support for programs such as presence of a wellness committee, written wellness policies, and having a budget for health promotion, among other things. A **health and safety score** (OSH) was calculated using 13 survey questions about policies and procedures for reporting injuries and hazards, and other common health and safety activities. Frequencies of reported program activity in HP and OSH domains were also computed, with differences assessed based on organization size and industry type.

WHI Survey Results—Selected results are provided below. A complete analysis has been submitted to the American Journal of Health Promotion and is provisionally accepted pending satisfactory response to the reviewer comments.

On average, the worksites achieved higher scores for health and safety than in either of the wellness activities.

Table 1. Mean Summary Scores: Massachusetts WHIS respondent employers

	Mean Score	Mean Percentage
Activities Wellness Score	3.4 (out of 17 questions)	19.9%
Administrative Wellness Score	2.9 (out of 15 questions)	19.4%
Health and Safety Score	6.2 (out of 13 questions)	47.5%

As expected, all three of the scores showed an increasing trend with organization size (Figure 1).

Figure 1

Comparison of Scores by Organization Size - Weighted Data
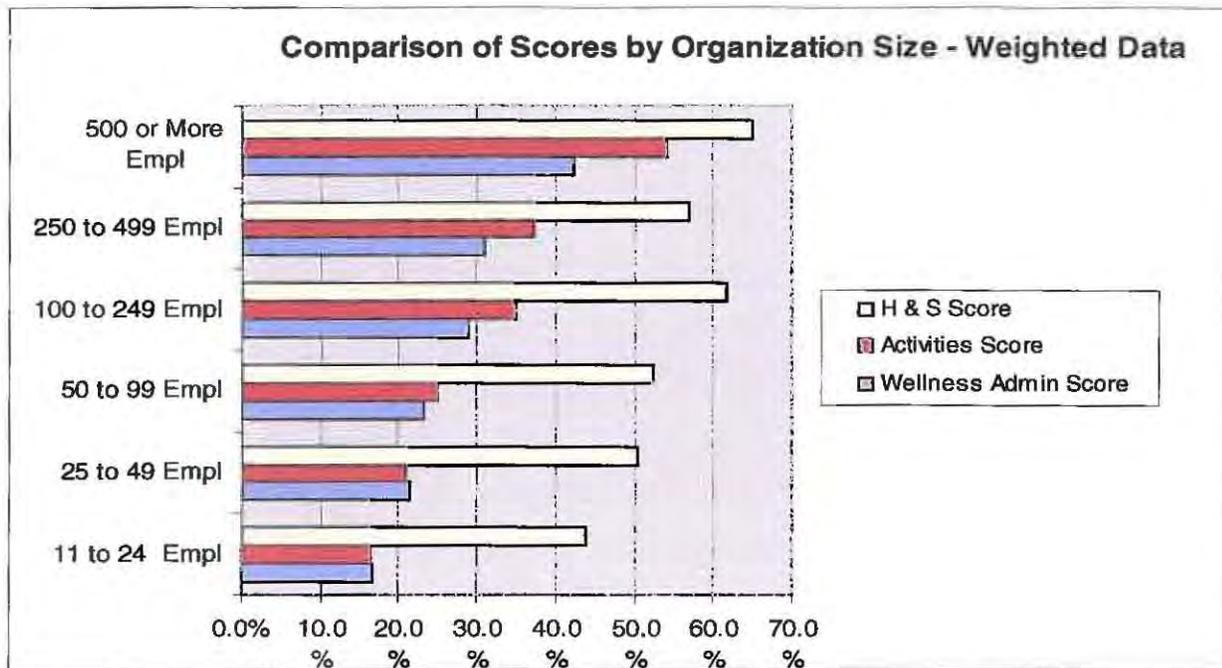
In addition, there was a significant amount of variability across industry sectors (Figure 2). Health care, manufacturing, and construction achieved the highest health and safety scores. However, educational services, healthcare, and finance & insurance scored the highest in the area of wellness.

Figure 2

Comparison of Scores by Industry - Weighted Data
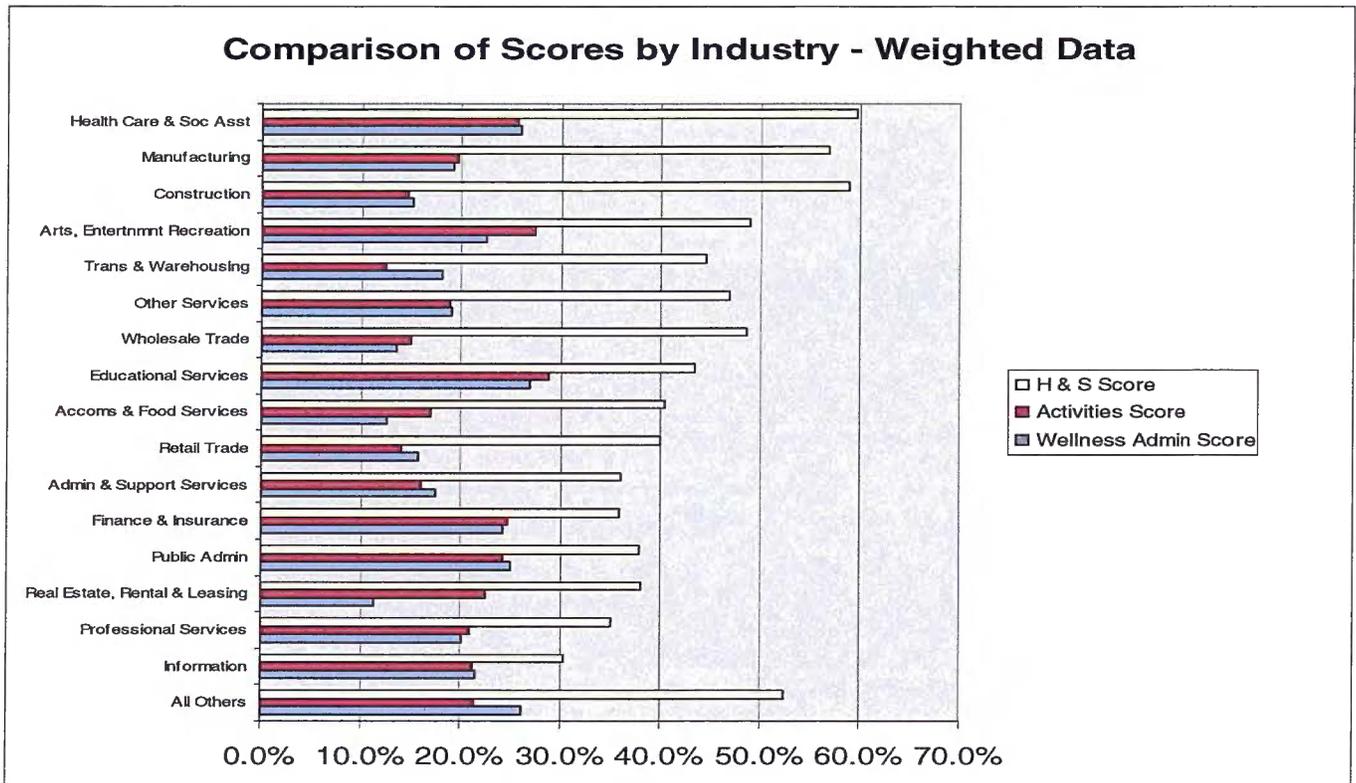
Note: 'All others' is comprised of 18 worksites – 4 agriculture, 5 utilities, 9 unknown.

We were interested in determining if health and safety activities tended to be correlated with wellness activities. Correlation between the scores at the overall level was analyzed and a weak correlation was observed (Table 2, below).

Table 2. Correlation Coefficients between occupational health and wellness scores: Massachusetts WHIS respondent employers

	Administrative Wellness Score	Activities Wellness Score
Health and Safety Score	.358	.294

We further examined survey question 55, which directly addressed this relationship, i.e.: "How often do those responsible for workplace health and safety at your worksite coordinate their efforts with managers responsible for health promotion or wellness activities?" The response options to this question were: always/often, sometimes/never, and don't know/not applicable. The same three scores were tabulated after stratifying on this variable.

Table 3. Stratified Response to Question 55 – Reported Coordination between Health and Safety and Wellness program activities

		Responses	% Resp	Mean Administrative Wellness Score	Mean Wellness Activities Score	Mean Health & Safety Score
High	Always / often	247	28%	26.6%	25.2%	68.3%
Low	Sometimes / never	230	26%	21.2%	20.0%	49.1%
Missing	DNK / NA / blank	413	46%	15.3%	17.5%	37.3%

Those worksites which indicated the highest amount of coordination between health and safety and wellness scored higher overall for all three types of scores than those organizations that indicated little or no coordination. We also found that unionization was positively correlated with both wellness and health and safety scores.

WHI Survey Discussion/conclusions--These analyses show that among a sample of MA employers, the proportion offering some type of WHP during 2008 (69%) is generally in range with proportions reported (58%) in a national sample of US employers (KFF, 2010). As expected, larger employers were more likely to report WHP activity than smaller employers. Differential implementation of WHP based on organization size remains an important challenge to public health. Smaller firms, which are less likely to offer health insurance coverage and WHP programs, also employ proportionately more low-wage non-unionized workers, who are at higher risk for chronic diseases (Linnan, 2008).

The score for OHS activities was generally higher and did not vary as much among worksites as did the WHP score. However, one-fifth of the surveyed worksites had neither an OHS committee nor a person designated as responsible for OHS. OHS scores tended to be highest for industry sectors, such as manufacturing, construction and heath care, which are more likely to be targeted by the federal Occupational Health and Safety Administration (OSHA) for enforcement of hazard-specific health and safety standards.

The correlation between scores for worksite wellness and health and safety programs was weak, indicating that these two functions do not appear to be working together in a coordinated fashion. This is supported by the results from survey question 55, which was an indication of how often those responsible for health and safety coordinated with those responsible for wellness programs. Only 28% of the respondents indicated that there was a high amount of coordination, while the remainder (72%) either left the question blank or indicated that there was coordination sometimes or never.

Patterns of coordination between OHS and WHP domains were seen for organization size (larger firms reported more coordination than smaller firms) and for industry. Self-reported OHS/WHP coordination was stronger in manufacturing, construction and heath care sectors (although well below 50% of respondents). There was a clear pattern of more activity in both OHS and WHP domains among the worksites that reported more coordination.

The higher overall health and safety scores indicate that occupational safety and health programs are more firmly entrenched in companies across Massachusetts. There is an opportunity to increase the

prevalence and quality of employee health promotion programs and to increase the coordination and integration of HP and occupational safety and health.

Discussion

The role of partnerships developed over the course of this 5 year project cannot be understated. Through our connections and collaboration with MDPH, many other opportunities arose for the Stress@Work project to gain entry. It was also clear that Stress@Work and its network of partners, MDPH, MNA, Vanguard Health Systems, among others, gained significant momentum over the course of the last three year of the project. In many ways, groundwork laid in the first two years of the project proved fruitful in producing strong and lasting partnerships and opportunities for education and dissemination activities.

Conclusions

The CPH-NEW Outreach, Communication, and Dissemination project engaged in a set of activities that were designed to increase health professional knowledge about the role of job stress in development of cardiovascular diseases (CVD). The specific aims of the project brought together a number of key findings that were used to assist in the development, implementation, and evaluation of a number of educational materials (fact sheets, website, etc.) and presentations (conferences, in-service training sessions, etc.). Specifically, a series of interviews were used to ascertain the degree of knowledge about, level of interest in, and perceptions of workplace stress and CVD among a wide variety of "health professionals", ranging from Massachusetts Department of Public Health personnel and Employee Assistance Professionals to nurses, cardiologists, and worksite wellness professionals. This information-gathering proved essential in the process of developing and disseminating a wide range of high quality educational materials. These materials were geared toward promoting the integration of health protection and health promotion in the address of work stress as a critical health issue. Additionally, the aims of the project called upon project personnel to cultivate and sustain a series of essential partnerships. This network of strong supporters and collaborators, created endless opportunities for dissemination of educational materials and messages regarding the connection between work stressors and CVD, as well as venues for continued collaboration and dissemination of strategies designed to use organizational approaches to reduce or eliminate exposure to workplace stressors.

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List of Appendices

Publications

Azaroff LS, Champagne NJ, Nobrega S, Shetty K, Punnett L. [2010] Getting to Know You: Occupational Health Researchers Investigate Employee Assistance Professionals' Approaches to Workplace Stress. Journal of Workplace Behavioral Health 25(4):296-319.

> *Addresses Aim 1: describes the results of a literature search conducted to fulfill this aim, specifically with regard to Employee Assistance Professionals. This group was targeted as a prospective primary audience for project C educational outreach early in the center grant. The target audience was subsequently broadened based on the overall interview findings.*

Nobrega S, Champagne NJ, Azaroff LS, Shetty K, Punnett L. [2010] Barriers to Workplace Stress Interventions in Employee Assistance Practice: EAP Perspectives. Journal of Workplace Behavioral Health 25(4):282-295.

> *Addresses Aim 1: describes the results of interviews conducted to fulfill this aim, specifically with regard to Employee Assistance Professionals. This group was targeted as a prospective primary audience for project C educational outreach early in the center grant. However the target audience was subsequently broadened based on the overall interview findings.*

Tremblay P, Nobrega S, Davis L, Erck L, Punnett L. Healthy Workplaces? A survey of Massachusetts employers. (Under review: American Journal of Health Promotion)

> *Addresses Aim 5: demonstrates the results of research collaboration with Massachusetts Department of Public Health (MDPH) to assess extent of integration of occupational safety and health with health promotion in practice. Development of the survey instrument was led by MDPH Division of Health Promotion and Disease Prevention (Chronic Diseases unit) in collaboration with CPH-NEW and the MDPH Occupational Injury and Illness Surveillance Program.*

Program Director/Principal Investigator (Last, First, Middle): **Punnett, Laura**

Inclusion Enrollment Report

This report format should NOT be used for data collection from study participants.

Study Title: Project C: Stress@Work

Total Enrollment: 37 interview subjects, cumulative   **Protocol Number:**

Grant Number: U19 OH008857-02

PART A. TOTAL ENROLLMENT REPORT: Number of Subjects Enrolled to Date (Cumulative) by Ethnicity and Race

Ethnic Category	Sex/Gender			
	Females	**Males**	**Unknown or Not Reported**	**Total**
Hispanic or Latino		1		1 **
Not Hispanic or Latino				
Unknown (individuals not reporting ethnicity)	25	11		36
Ethnic Category: Total of All Subjects*	25	12		37 *
Racial Categories				
American Indian/Alaska Native				
Asian		2		2
Native Hawaiian or Other Pacific Islander				
Black or African American				
White	9	2		11
More Than One Race				
Unknown or Not Reported	16	8		24
Racial Categories: Total of All Subjects*	25	12		37 *

PART B. HISPANIC ENROLLMENT REPORT: Number of Hispanics or Latinos Enrolled to Date (Cumulative)

Racial Categories	**Females**	**Males**	**Unknown or Not Reported**	**Total**
American Indian or Alaska Native				
Asian				
Native Hawaiian or Other Pacific Islander				
Black or African American				
White				
More Than One Race				
Unknown or Not Reported		1		1
Racial Categories: Total of Hispanics or Latinos*		1		1 **

* These totals must agree.
** These totals must agree.

Inclusion of Gender and Minority Study Subjects

Women and members of ethnic minorities were included in proportion to their presence in the workforces at the study sites.

Inclusion of Children—The Stress@Work education, translation, communication, and dissemination project targeted employed health care personnel and other college-educated health practitioners focused on health in the workplace or in public health. Workers younger than 21 years were not interviewed in the study. The study findings could be relevant for all workers who experience excessive job strain, or who will be in a position of designing public health campaigns and programs to reduce risk factors for heart disease and stroke.

Materials available for other investigators

Interview Script—Knowledge and attitudes of Job Stress as a CVD modifiable risk factor and perceived role of Employee Assistance professionals in organization level interventions (See Appendix C-2)

Stress@Work website http://www.uml.edu/centers/cph-new/job-stress/default.html (Appendix C-7)

List of Appendices

C-1   Cardiologist Interview Report

C-2   Employee Assistance Professional (EAP) Interview Guide

C-3   Employee Assistance Professional (EAP) Interview Report

C-4   MA Department of Public Health (MDPH) Interview Report

C-5   Work Stress and CVD Evidence Summary

C-6   Project C presentation list

C-7   Stress@Work website fact sheet

C-8   Job Stress fact sheet

C-9   Job Stress business case fact sheet

C-10   Employee Assistance Professional Association (EAPA) May 8, 2009 presentation

C-11   Sample job stress presentation evaluation form

C-12   Stress@Work website evaluation tool

C-13   Combined Approaches to Work and Health conference agenda

C-14   Stress: the Forgotten Risk Factor conference brochure

C-15   MDPH Working on Wellness (WW) training presentation

C-16   Worksite Health Improvement Survey results PPT slides (presented at American Public Health Association on 10/31/11)

Work-stress and Cardiovascular Disease:
Perspectives of Cardiologists

**Report of findings from interviews conducted with
5 Massachusetts Based Cardiologists
December 2008**

Partial Cardiologist Report

Interview

The interview was individual and performed over the phone or in person. Its estimated duration was "less than 10 minutes." Interviewees were blinded about the contents and aims of the interview. The strategy was to funnel the conversation from general issues about prevention of specific generally accepted cardiovascular risk factors (such as obesity, hypercholesterolemia, sedentary life, etc) to psychological stress in general (such as that caused by family, economic, or marital issues) and work-related psychological stress in particular. If the interviewee had spontaneously mentioned psychological work stress, the questions followed over that mention; if psychological stress was not spontaneously mentioned, it was introduced by saying "You did not mention work stress, what is your evaluation of it as a risk factor?" Attachment 1 contains the general outline for the interview. Two interviews were performed in person and three over the phone. Only three of them accepted to be audio recorded even when confidentiality was ensured. The interviewer (the same person for all the interviews) took notes for the recorded and non recorded interviews. Notes were completed right after the interview.

Data analysis

The analysis was directed to organize the information according to the following aspects:

- Hierarchy of risk factors

- Valoration of the concept of work-related psychological stress as a risk factor for CVD.

- How patients report their exposure to work stress.

- How work stress is usually managed by the cardiologist to help his/her patient to reduce his/her cardiovascular risk

- What is needed, if any is needed, to help patients with CVD and work stress exposure

Results

Work-related psychological stress is not high in the scale of risk factors.

Cardiologists were asked to mention the main risk factors for CVD with emphasis of what they routinely see while working with patients. Diabetes, cholesterol levels, diet, sedentary life, high blood pressure, genetics, and obesity were mentioned repetitively and cardiologists easily expanded on each of them. In general, the interviewees had an important variability in how they organized the risk factors. There was no organization of risk factors by hypothesized causal sequences. Genetics and sedentary life were as close to CVD as high cholesterol and high blood pressure. The answers in general reflected more the occurrence of these risk factors in their patients than the physiological mechanisms underlying the causation of CVD. It is important to note that for each of these risk factors there is one or more interventions easily available to the physicians and their patients. Drugs (for all of them), behavioral interventions (for most of them), and surgery (as bariatric surgery for obesity) are currently well institutionalized and usually available when prescribed. Additionally, all the above mentioned risk factors were located in the patients' body; the "place" that receives more attention during the education of physicians.

Psychological stress is well received

Two cardiologists made spontaneous mention of psychological stress in general and work-related psychological stress in particular, as one of the most common causes of cardiovascular diseases. One of these cardiologists was a current PhD student and the other was just graduated. On the other group of cardiologists we hypothesize that changes in their evaluation of risk factors is more likely coming from changes in procedures or regulations (occurring at the institutional level and disseminated) than from their own exposure to scientific information. It is clear that the PhD student and the recently graduated cardiologist had been exposed to knowledge that is currently not so unusual in the scientific academia.

For those who did not spontaneously mention psychological stress, it was mentioned to them as one eventual risk factor and they were asked by their opinion. None of them denied the possibility that psychological stress in general and psychological work stress in particular were a cause of cardiovascular disease. Even more, one of those who did not spontaneously mention work stress emphasized that its importance as risk factor "*is evident for acute cardiovascular event.*" However, the scientific literature also supports a strong cumulative effect of work stress on the cardiovascular system.

Patients informing about work-related psychological stress

Although "*family-related psychological stress is very common,*" the group of cardiologists reported that very few patients spontaneously mention work-stress as a situation that could be impacting their cardiovascular health. "*I have to ask*" was a comment that summarized this finding. This is an important issue that could have contributed to lack of consideration of work-stress as a CVD risk factor. Workers are not always aware of their own exposure to

work stress. Many of them do not know that stress can cause diseases. Therefore, two not so likely events are needed for a patient to spontaneously report his/her work-stress exposure at the cardiologist's practice: to be aware of the exposure and to know the association with CVD.

For some cardiologists, the exposure "*sometimes is evident, they do not say but you can tell…*" Experienced physicians can obtain information that is not explicit. In some cases, they can even predict that it is so important that "*it is an issue I do not even try to open*" and this points to a gap between what is known as a problem and what can be done to solve it.

What do cardiologists do when dealing with work-related psychological stress?

The most direct answer to what they do when a patient says or acknowledges that is affected by work-stress is "*I cannot do anything.*" Only one of the interviewees had a strategy to do an intervention and the intervention focused on coaching the patient to practice some relaxing activities as, one example of many, to think about his/her favorite hobbies or physical exercises.

When asked, the cardiologists spontaneously gave the reason why they "*cannot do anything.*" One consensual issue was the overburdened schedule and the short time available for each patient. "*There is no time during the visit*" summarizes the scarcity of this provider as a human resource and the maximization of productivity currently so in vogue across many work organizations. Unfortunately, even if additional time for each patient is provided it would not be the solution; cardiologists are trained in cardiovascular illnesses and work-related

cardiovascular stress is not one of them, it is a risk factor and "*it is not my specialty.*"
Additionally, it seems that lack of interventions to face exposure to occupational stress is related to lack of specific institutional resources because "*we can just send them to the mental health specialist.*" This statement makes clear that even the assistance of mental health experts, when available, would not be the solution to this risk factor, so ubiquitous that is not located in the reachable field where healthcare providers work (body and mind) but in a social institution where the patient works.

Only one cardiologists had done something beyond her cardiologist role "*when I have called an employer,... that usually helps.*"

What do cardiologists need to help their patients?

There was no clear expression of what is needed. This is a strange arena for clinicians and, correspondingly, they do not know what to do and what is needed to do something. They tend to see a solution in another provider "*we have enough psychologists in our center*" or "*a counselor could help.*" Even if work-stress is acknowledged as an important risk factor, there is no easily available pathway to help the patients affected by the exposure. Cardiologists' field of action does not include modification of the context in which the patient lives. Every "treatment" of risk factors is institutionalized trough activities performed by the cardiologists (drugs) or another provider (diet, surgery) or social institution (exercise).

Discussion

What did we learn?

We attempted to learn how cardiologists deal with the issue of exposure to work stress in their patients. The general purpose of this was to learn why there is no report of work-related cardiovascular diseases. We had two hypotheses, first, the evidence could be not enough for cardiologists and, second, the nature of work stress exposure could make unfeasible any clinical utilization of this knowledge. We got frustrated by our inability to recruit cardiologists. Even cardiologists could not recruit their own colleagues. Our final sample was limited to five cardiologists, three of them recruited by the initial researchers. The responses tend to align with the second hypothesis. They know or acknowledge that work stress can be an important risk factor for CVD (although "within the patient" risk factors are most commonly mentioned), but they have no tool to deal with it and they do not even know what tool should be available.

Questions for cardiologists

1. In the context of causation of CVD and according to your own personal experience, what factors are the most common causes of CVD?

2. We have been talking about causes of CVD in general, what about the factors that cause CVD in working people? Are they the same or are they different?

3. You have mentioned all these factors (list: a, b, c, d, etc) and have given priority to these (a, b, d). We do not have time to go through all the mentioned and non-mentioned factors. Let us focus in a factor that 'was'/'was not' mentioned: "psychological stress." According to your personal experience, how do you consider "psychological stress" in the causation process of CVD and what do you do at your office about that?

   (If needed) how do you consider "psychological stress" in the causation process of CVD in working population?

4. Now, we would like you to emphasize even more your personal experience, the practical implications, the "realistic approach. "Have ever the issue of "work related psychological stress" came up with any patient.
   a. If "yes", what have you done in that situation?
      i. Did the patient or a relative report?
      ii. Did you ask?
   b. If "no", what would you hypothetically do if eventually this issue comes up with any patient?

5. In relation to "work-related psychological stress." Is there something that you would like to do to benefit your patients but some changes or different approaches or a kind of institutional support are needed to make that benefit practical, feasible, or possible?

6. Finally, it would be good to hear from each of you what you have to say as a closing statement of your participation in this interview.

7. May we mail you some short questions later to help us clarify some points?

CPH-NEW Project C
EAP interview guide

Interview Objectives

1. Understand the knowledge level of EAP professionals on the relationship between occupational stress and cardiovascular disease and other chronic conditions.

2. Understand how the EAP interacts within organizations to address mental health issues of individual employees and overall workforce.

3. Understand how EAP views their role when it comes to helping employees address occupational sources of stressors.

4. Describe channels and preferences for educating EAPs on occupational stress and CVD.

I want to thank you for taking time for this interview today. My name is ___ and am from the University of Massachusetts Lowell, in the Department of Work Environment. This interview is part of an educational project that is aimed at professionals concerned with employee health.

The interview will take about 45 minutes, and we will be taping our interview today. I want to confirm that you have had time to read and sign the informed consent form, and to review a couple of points in the form.

Consent points to review….

Do you have any questions before we begin?

EAP ROLE WITH CLIENTS

1. Can you tell me about your role as an Employee Assistance Professional? What are some of the things you do in your job?

2. What types of problems do you help people with? (Or "you've just described ____ and ____ as examples of problems you help people with. What are some other examples?")

Probe: Which of the problems you mentioned are the most common?

3. Which problems do you feel you have had success with treating? Which problems are the most challenging to treat successfully?

RESOURCES AND SUPPORTS

4. What kinds of resources are available to you for helping clients address their problems?

   Probe: Are there certain tools that you use to assist with diagnosis?
   Probe: Are there certain tools that you use to assist with intervention strategies?

5. Where do you go for information or advice about ways to help clients?

Probe: Do you routinely receive information on state of the art practice for EAP? If so, from whom/what organizations?

Probe: Are you required to do continuing education to maintain your certification or licensure? If so what are some of the common providers of CE credits?

Probe: Are there certain seminars or conferences (online or live) that you attend where this information could be presented?

KNOWLEDGE OF CVD RISK FACTORS

6. We are interested in risk factors for cardiovascular disease and stroke. What do you think might put people at risk for these conditions?

7. In your role as an EAP, what do you do to address these issues or risk factors?

INTERVENING WITH PROBLEMS ON THE JOB

We talked earlier about the kinds of problems that you help employees with. I would like to ask you to talk a little more about that now.

8. When someone comes to you because of a problem related to their work environment (a performance issue, interpersonal problems with co-workers, difficult supervisor, job demands, etc), how do you help that person address the problem? Can you give me some examples?

Probe: How would you help when the issue is work load or something else related to how their work is organized?

Probe: How do you help employees deal with issues related to relations with management and/or poor communication?

9. Are there generally certain areas that you feel are within your role, and certain areas that are beyond your role for helping clients with work-related problems? If so, can you give me an example?

RELATION TO ORGANIZATION

So far, we have discussed how you interact with employees to help them solve their problems. Now I would like to ask you about ways in which you might interact with organizations to address problems of the total workforce.

10. Would you please describe what positions and departments of your clients' organization(s) you or your firm interact with? What is the nature of your interactions with them?

Probe: Human Resources VP, training manager, wellness coordinator, benefits manager, etc.

11. Do you (or does your firm) track cases to monitor the most common issues you see? Does this data get reported to your clients' organization, and if so, to whom?

12. How do you think that information is used by the organization?

13. Have there been instances where you or your EAP firm provides recommendations to company managers about interventions needed at the company level to address employee problems? If so, what are some examples?

Probe: Training interventions? Work organization interventions? Policy? Other?

Probe: If you or your EAP firm has not provided recommendations, what do you think would happen if you did?

SUGGESTIONS FOR EDUCATIONAL MATERIALS

14. Part of our role is to provide education for employee health professionals about the relationship between occupational stress and cardiovascular disease. What types of educational activities and materials would be most helpful for EAPs to learn more about how job stress as a risk factor for heart disease?

Work-stress and Cardiovascular Disease:
Perspectives of Employee Assistance Professionals

Report of findings from interviews conducted with
New England-based EAP professionals
January 2009

The University of Massachusetts Lowell, with funding from the National Institute for Occupational Safety and Health, seeks to increase the awareness of Massachusetts health professionals on the causal relationship between work stress (also called job strain or occupational stress) and cardiovascular disease (CVD) and other chronic diseases.   We will develop and evaluate curriculum materials to assist health professionals with incorporating occupational stress reduction strategies (such as improving work processes, job design, and psychosocial climate) into broader prevention efforts aimed at reducing cardiovascular disease and other chronic diseases. Considerable evidence has demonstrated that occupational stress contributes to CVD morbidity and mortality. Clinicians, however, usually do not consider occupational stress as a preventable risk factor for CVD.

Employee assistance professionals (EAPs) have been identified as an important target audience because of their role in assisting employees to cope with the effects of job stress. Interviews with 9 Massachusetts EAPs were conducted between January 2007 and May 2008 to better understand EAP knowledge about the work stress/CVD relationship, preferred formats for educational materials, and how EAPs assist employees with modifying stressful working conditions. Participants included EAPs employed "in-house" and by firms providing contracted EAP services. All participants were responsible for counseling individual employees and some also had account management duties. The interviews provided valuable insights on perceptions about job stress, typical strategies for assisting employees, and potential roles for the EAP to influence work organization factors that contribute to stressful working conditions.

This report provides a summary of findings and outlines possible future activities. Interview questions are provided in Attachment A. We welcome additional input and involvement from the Employee Assistance community on future activities, such as pilot testing of educational materials and making presentations to EAP groups. We invite you to send inquiries and comments to the project contacts listed below. To learn more about this project and others at our Center, please visit www.uml.edu/centers/CPH-NEW.

Stress at Work Project contacts:

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Key Findings

Research question 1: What is the overall knowledge level of EAPs about the relationship between occupational stress and cardiovascular (and other chronic) diseases? What information have EAPs seen on the topic of job stress and CVD?

Stress, from any source was readily identified as an important contributor to heart disease and other chronic conditions. Most EAPs acknowledged the workplace as a potent source of stress; issues raised involved work overload, staffing problems, interpersonal conflicts with co-workers or supervisors, and organizational changes (usually layoffs). However, few could recall specific literature focused on the specific contribution of occupational stress to the development of chronic conditions.

Research question 2: How do EAPs assist individual employees and employers to resolve job stress problems? How do they view their roles?

EAPs overwhelmingly said their primary role was to assist individual employees with assessing the sources of stress, and assisting them with developing more effective coping strategies. This process entails counseling and occasionally, consultations with supervisors.
Most EAPs said they would not be able to strongly influence organizational changes to address job stress with management. However, EAPs do provide data on presenting problems to human resources and other company managers, and group training for supervisors and employees on related topics such as stress management and conflict resolution.

Only one EAP spoke specifically about the importance of structural positioning within an organization as being crucial for influencing company policies. The issue of EA programs being "internal" vs. "external" was salient for every interview participant. Contracted EAPs tended to report more ambivalence about dealing with job stress issues, mostly due to perceptions of contract vulnerability.

Research question 3: Where do EAPs look for information on state of the art practices on specific topics (including job stress)? What resources are available?

The most frequent responses were (in decreasing order) colleagues, the internet, and conferences. Internet resources included professional association websites such as Employee Assistance Professional Association (EAPA) and Employee Assistance Society of North America (EASNA) as well as EAP employers' intranet and client websites. The latter were particularly relevant for EAPs employed by firms providing contracted EA services. Newsletters and peer reviewed journals were not mentioned as important sources of information.

Research question 4: What are the preferred channels and formats for educating EAPs on job stress and CVD?

EAPs recommended websites, conference presentations, and articles in EAP newsletters and journals as effective ways to disseminate information about job stress. Website materials should include research, information summaries, and downloadable tools to use with clients. Endorsement by EAPA or another recognized professional association would be a plus.

EAPs suggested several types of materials that would be beneficial for their clients:

Tools for communicating with employees—
- **articles** for employee newsletters
- **brochures** for employees (make it colorful, catchy, action-oriented)

Tools for communicating with employers—
- **presentation** materials that can be delivered to management and/or supervisors
- **fact sheet** for human resources managers (make it colorful/attractive, describe impacts of job stress, and provide specific actions to address the problem)
- **webpage** for employees/supervisors/management with downloadable resources and links to other pertinent organizations providing tools, data, information

Conclusions

Employee Assistance professionals (EAPs) are very familiar with the general correlation between stress and poor health, and the readily acknowledge working conditions as a serious source of stress exposure. However, very few EAPs could recall specific professional literature that described the specific contribution of work stress to disease development, nor were they familiar with organizational interventions for reducing stress exposure and stress related illness.

Given the current trend to outsource EA services and other health benefits, it is important to recognize that responsibility for employee health and safety in companies is often decentralized. EAPs are one professional group of many who may be in a position to help reduce exposure to work stressors. Providing information about evidence-based worksite intervention strategies could help EAPs address job stress problems with their clients in several ways, including:

- Assisting employees with identifying ways to modify their work environment to reduce stress exposure.

- Partnering with other worksite health and wellness professionals to implement a range of preventive programs aimed at reducing stress, addressing early signs of stress related illness, and providing specific stress control measures for employees already affected by heart disease and other chronic diseases*.

- Providing training on the impacts of work stress and examples of company policies and practices that can be effective for promoting a psychologically healthy workplace.

*A growing body of evidence shows that heart attack sufferers are at higher risk for a repeat event if they return to stressful working conditions (C. Aboa-Eboule et.al, JAMA Oct 10, 2007—Vol. 298, No. 14).

By providing educational materials and data to company managers, EAPs can help to build the case for more investment in healthy workplace initiatives. EAPs are well-positioned to recommend training and other interventions aimed at minimizing stress exposure and stress-related illnesses in the workplace.

Future Activities

Materials development and pilot testing will be underway during winter 2009 with the goal of disseminating tested materials to EAPs, worksite wellness and work-life professionals, and others implementing worksite health promotion activities in the spring of 2009. Pilot testing will assess content relevance, visual appeal, and likelihood of use with clients.

Planned presentation: "Work Stress and CVD: organizational approaches to reducing workplace stress exposure and stress related illness," May 2009 Massachusetts-Rhode Island EAPA annual conference, Waltham, MA.

Acknowledgements

We would like to acknowledge the contributions of Lenore Azaroff, former Principal Investigator of this project, for her early work on designing the interview questionnaire, establishing links to key EAP leaders in the New England region, and for extensive literature search activities. We thank Debbie Van Langen, graduate research assistant, for conducting the initial interviews. Finally, we thank Karishma Shetty, community psychology graduate research assistant, for assisting with scheduling, recording and transcribing the majority of interviews, and for assisting with preliminary data analysis.

Employee Assistance Professional (EAP) interview questions

Research objectives:

1. Learn about EAP knowledge level on the relationship between occupational stress and cardiovascular disease and other chronic conditions.
2. Understand how the EAP interacts within organizations to address mental health issues of individual employees and overall workforce.
3. Understand how EAPs view their role when it comes to helping employees address occupational sources of stressors.
4. Learn preferred channels and formats for education on occupational stress and CVD.

INTRODUCTION

I want to thank you for taking time for this interview today. My name is ___ and I am from the University of Massachusetts Lowell, in the Department of Work Environment. This interview is part of an educational project that is aimed at professionals concerned with employee health.

The interview will take about 45 minutes, and we will be taping our interview today. I want to confirm that you have had time to read and sign the informed consent form, and to review a couple of points in the form.

Review key informed consent talking points....

Do you have any questions before we begin?

EAP ROLE WITH CLIENTS

1. Can you tell me about your role as an Employee Assistance Professional? What are some of the things you do in your job?

2. What types of problems do you help people with? (Or "you've just described ___ and ___ as examples of problems you help people with. What are some other examples?")

    Probe: Which of the problems you mentioned are the most common?

RESOURCES AND SUPPORTS

3. What kinds of resources are available to you for helping clients address their problems?

4. Where do you go for information or advice about ways to help clients?

    Probe: Do you routinely receive information on state of the art practice for EAP? If so, from whom/what organizations?

    Probe: Are you required to do continuing education to maintain your certification or licensure? If so what are some of the common providers of CE credits?

    Probe: Are there certain seminars or conferences (online or live) that you attend where this information could be presented?

KNOWLEDGE OF CVD RISK FACTORS

5. We are interested in risk factors for cardiovascular disease and stroke. What do you think might put people at risk for these conditions?

6. In your role as an EAP, what do you do to address these issues or risk factors?

INTERVENING WITH PROBLEMS ON THE JOB

We talked earlier about the kinds of problems that you help employees with. I would like to ask you to talk a little more about that now.

7. When someone comes to you because of a problem related to their work environment (a performance issue, interpersonal problems with co-workers, difficult supervisor, job demands, etc), how do you help that person address the problem? Can you give me some examples?

   Probe: How would you help when the issue is work load or something else related to how their work is organized?

   Probe: How do you help employees deal with issues related to relations with management and/or poor communication?

8. Are there certain areas that you feel are within your role, and certain areas that are beyond your role for helping clients with work-related problems? If so, can you give me an example?

RELATION TO ORGANIZATION

So far, we have discussed how you interact with employees to help them solve their problems. Now I would like to ask you about ways in which you might interact with organizations to address problems of the total workforce.

9. Would you please describe what positions and departments of your clients' organization(s) you or your firm interact with? What is the nature of your interactions with them?

   Probe: Human Resources, training manager, wellness coordinator, benefits manager, etc.

10. Do you (or does your firm) track cases to monitor the most common issues you see? Does this data get reported to your clients' organization, and if so, to whom?

11. How do you think that information is used by the organization?

12. Have there been instances where you or your EAP firm provides recommendations to company managers about interventions needed at the company level to address employee problems? If so, what are some examples?

   Probe: Training interventions? Work organization interventions? Policy? Other?

   Probe: If you or your EAP firm has not provided recommendations, what do you think would happen if you did?

SUGGESTIONS FOR EDUCATIONAL MATERIALS

13. Part of our role is to provide education for employee health professionals about the relationship between occupational stress and cardiovascular disease. What types of educational activities and materials would be most helpful for EAPs to learn more about how job stress as a risk factor for heart disease?

Work-stress and Cardiovascular Disease:
Perspectives of Health Professionals

Report of findings from interviews conducted with selected
Massachusetts Department of Public Health personnel
August, 2008

The University of Massachusetts Lowell Center for the Promotion of Health in the New England Workplace (CPH-NEW), with funding from the National Institute for Occupational Safety and Health (NIOSH), seeks to increase the awareness of Massachusetts health professionals on the causal relationship between work stress (also called job strain or occupational stress) and cardiovascular disease (CVD) and other chronic diseases, as well as organizational approaches to prevention (such as improving work processes, job design, and psychosocial climate). The project goal is to develop and deliver curriculum and training materials for a variety of professionals, such as employers, employees, employee assistance professionals, and health professionals.

Public health professionals are one audience identified for the project's educational efforts. Interviews with 12 public health professionals at the Massachusetts Department of Public Health (MDPH) were conducted between October 2007 and May 2008 to understand better their level of knowledge about the relationship between work stress and cardiovascular disease, assess the ways that public health programs address stress (from work and other sources), and identify preferred materials and channels for receiving information about these issues.

Participants included program officers, directors, managers, evaluators from several prevention-focused public health divisions, including the Office of the Health Commissioner, and the Chronic Diseases Division (including Diabetes, Heart Disease, Tobacco Control, Overweight Prevention, and the Women's Health Network programs).

This report provides a summary of findings for five key research questions and outlines future activities for the project. The interview questions are provided in Attachment A. We welcome additional input and involvement as we design and pilot test educational materials. **Please** direct project inquiries and comments to the project contacts listed below. To learn more about this project and others of CPH-NEW, please visit www.uml.edu/centers/CPH-NEW.

Work Stress and Cardiovascular Disease Project contacts:

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Key Findings

<u>Research question 1</u>: **What is the level of awareness of work stress as a risk factor for cardiovascular disease (CVD) and/or other chronic illness?**

There was widespread general awareness that stress negatively influences health and can contribute to disease. However, there was very little acknowledgement of the specific correlation between occupational stress and chronic disease, nor the mechanisms by which the experience of stress translates to behavioral and physiologic effects. A very small subset of participants who had recently viewed a television documentary on this particular topic was able to describe mechanisms for stress-disease relationship.

While the vast majority of participants spontaneously mentioned stress as a risk factor for CVD, several said that non-work stressors were equal to or more important contributors to CVD risk, particularly for clients of MDPH programs. For instance, difficulties with housing, economic concerns, and working multiple jobs were given as specific pressures that clients encounter.

> *[Work stress is about]* "*I got to go to work.*" "*[It's] not [the] work environment that creates stress, it's going to work.*" (Working multiple jobs or difficult or monotonous jobs)

Many participants were able to give specific examples of job stressors from their own experiences or from the experiences of their program's client populations.

> *"Low wage jobs have more stress because they have less control over their hours, less control over their job duties, less autonomy."*

> *"Lots of responsibility but no authority is a source of stress."*

> *"The environment in which you work, and the relationship you have with your manager, can definitely create stress, and the relationship you have with senior management absolutely relates to stress."*

One participant said that it was difficult to quantify stress because MDPH doesn't get a lot of surveillance data on stress.

<u>Research question 2</u>: **What information or materials have public health professionals seen on this topic?**

The vast majority of participants reported that they had not seen publications or materials about the relationship between job stress and cardiovascular or other chronic diseases. The exceptions were those participants who had already attended presentations about job stress by University of Massachusetts Lowell faculty, or those who had viewed a recent television documentary ("Unnatural Causes") which explored the role of stress and other environmental exposures in the development of disease.

<u>Research question 3</u>: **To what extent is stress (from personal or occupational sources) addressed as a modifiable risk factor in public health programs?**

Overall, stress appears to receive very little emphasis in most public health chronic disease and wellness programs, with the exception of the Tobacco Control Program and the Chronic Disease Division's Worksite Programs. The Tobacco Control Program incorporates individual stress management training (albeit very briefly) in the curriculum for addictions counselors certification. However, there was no mention of strategies to reduce exposure to stressors at work or in other environments. Despite this, program staff described a strong relationship between stress and smoking.

"Stress is the #1 reason given [by clients] for relapse."

"There is no plan to deal with stress during quit [smoking] attempts."

Note that we did not have access to determine how stress management is addressed by telephone counseling sessions of QuitWorks, the free quit-smoking counseling service provided by MDPH through contract with John Snow, Inc. This is an area for future inquiry.

MDPH worksite wellness activities do address work stress as a modifiable risk factor, largely due to an ongoing collaboration between MDPH personnel (Occupational Health and Chronic Disease divisions) and the University of Massachusetts Lowell, Department of Work Environment. For instance, MDPH recently published guidelines for Massachusetts businesses that featured work stress topics very prominently, as did a 2008 MDPH survey of health and wellness practices among Massachusetts businesses.

Aside from the examples above, participants said that stress was either not addressed or was addressed indirectly during screening sessions with clients. Some participants said that their funding excluded mental health services, thereby making it very difficult to screen for and address the psychological impacts of stress in their programs. Because MDPH programs serve low-income populations who often have multiple social, economic, and environmental health concerns, non-work sources of stress and depression were identified as salient and unmet mental health needs of program beneficiaries.

One participant estimated that only one-half of her program's client population was employed, many with part-time jobs in the service industry or in seasonal jobs that do not provide affordable health insurance.

Research question 4: Where do public health professionals go to get new information about state-of-the art practices?

Participants gave varied replies to this question, although many seemed to rely on information provided *internally* through MDPH. For example, list serves, conferences of DPH-sponsored coalitions (also known as "Partnerships"), and other meetings were commonly mentioned sources of new information on advances in clinical and wellness practices. Centers for Disease Control conferences and other public health association meetings were also mentioned as important *external* sources of information (for example, Massachusetts Public Health Association, APHA, Society for Public Health Education, etc.).

One very interesting nursing organization was recommended as being very close to the mission of this project. The Preventative Cardiovascular Nursing Association (headquartered in Wisconsin) has tools for health care providers that assemble topic information from many sources. Examples are CVD guidelines, pocket guides, CVD risk reduction program manual, etc. The PCNA website www.pcna.net also provides direct links to CVD online education options for obtaining nursing continuing education credits.

Other resources mentioned included:
Pri-Med (www.pri-med.com)
Institute for Health and Productivity Management Conference
National Heart, Lung, and Blood Institute
National Association of Chronic Disease Directors (NACDD)
The Medical Foundation-Clearinghouse (MDPH contracted fulfillment center for materials)

Research question 5: What are the preferred materials and channels for educating public health professionals about occupational stress?

Our interviews produced recommendations for specific materials, audiences, and content that would be useful to public health professionals.

Presentations at MDPH and other public health conferences were suggested as important vehicles for raising awareness. Presentations should provide continuing education credits whenever possible. To broaden the appeal to many public health professionals, highlight the relationship of stress to multiple chronic conditions.

> *"Frame stress as important to many health outcomes, not only CVD."*

Community Health Workers were mentioned by several participants as having an existing train-the-trainer system into which work stress training materials could be integrated. This could include adding stress as a new topic to existing risk reduction education modules that are given to case managers and nurses.

MDPH regional community liaisons were suggested as vital links to business, health care, and community settings that could potentially pilot test new materials and assist with materials dissemination in local communities.

Brochures for patients were suggested as useful tools for clinical settings to help practitioners communicate what patients can do to control stress in their lives. The MDPH Clearinghouse was mentioned by several participants as a place to search for free patient education materials.

Interestingly, business managers were recommended as a target audience by many participants who said that top managers need to be convinced that addressing stress will help their bottom line.

> *"Training materials for CEOs is important. They need to see the return on investment spelled out. Address management style and office culture."*

Conclusions

The purpose of interviewing state public health professionals was to assess the current knowledge about the relationship between work stress and cardiovascular disease and to look for partnership opportunities with MDPH to disseminate knowledge about occupational stress. Interviews confirm that while there is widespread general awareness about the negative impact of stress on health, there is far less understanding of specific mechanisms by which the experience of stress translates to physiological responses related to CVD and other chronic health conditions. There is also very little understanding of the types of interventions that can be done in the workplace to reduce exposures to stress that are part of the work environment.

Most interview participants expressed an interest in learning more about the negative consequences of job stress what can be done about it. However, interview responses made it clear that state public health professionals have limited ability to focus on stress in their current program activities. There may be opportunities to incorporate education on the work-stress and disease relationship within existing training programs for clinicians who provide publicly funded care in clinical settings. For instance, community health worker and case manager training programs, MDPH sponsored conferences, and DPH list serves were recommended as possible dissemination channels.

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At the same time, some participants stated that many of their program's beneficiaries are not employed, and thus it is unclear whether knowledge about work stress per se will have urgent appeal to clinical and community health practitioners who work primarily with un-employed, under-employed, or working poor clients. Participants talked about their clients' stress sources being varied and rooted in social and environmental determinants, with relatively less emphasis on the job as a major contributor. More research is needed to understand the perspectives of front-line practitioners themselves to make a more informed decision about what materials would be useful in publicly funded clinical care settings.

The Worksite Wellness Initiative at MDPH does offer a strong opportunity for a continued meaningful partnership on work stress education and awareness. This initiative was recently reorganized to report to the Health Commissioners Office, giving more visibility to this issue as a priority for the new Governor. Pilot initiatives are underway in 15 settings to test various best practice models, and we anticipate opportunities to work together on testing research instruments, and developing training and educational materials for use in Massachusetts businesses.

Future Activities

Continued engagement with the MDPH worksite initiatives program

Presentations at the MDPH sponsored conferences
        Scheduled: Ounce of Prevention, October, 2008

Continued participation as Executive Committee member for the Partnership for a Heart Healthy and Stroke Free Massachusetts
        Scheduled: PHHSFM Annual Conference, January, 2009

Pilot testing of educational materials with appropriate MDPH programs

Acknowledgements

We acknowledge the contributions of several people who were instrumental in our data collection efforts. Kathy Foell and Lisa Erck from MDPH assisted with recruitments by referring us to key chronic disease and wellness personnel at the health department. Lenore Azaroff, Principal Investigator of the study until the fall of 2007, laid the groundwork for interviews by meeting with MDPH personnel and coordinating informational presentations at key health department events. Karishma Shetty, University of Massachusetts Lowell masters candidate, coordinated interview scheduling, took notes, transcribed interviews, and assisted with initial analyses of interview content. Valerie Machinist, consultant and MDPH occupational health program manager, conducted the final set of interviews.

<u>Interview questions for Health Professionals</u>

Interview Objectives
1. Understand the knowledge level of public health professionals on the relationship between occupational stress and cardiovascular disease and other chronic conditions.
2. Identify ways that stress prevention or management is addressed in publicly funded chronic disease prevention and workplace wellness programs.
3. Describe channels and preferences for educating public health professionals on occupational stress and CVD.

INTRODUCTION

I want to thank you for taking time for this interview today. My name is ___ and I am conducting interviews on behalf of the University of Massachusetts Lowell, Department of Work Environment. This interview is part of an educational project that is aimed at professionals concerned with employee health.

The interview will take about 45 minutes, and we will be taping our interview today. I want to confirm that you have had time to read and sign the informed consent form, and to review a couple of points in the form. (Proceed to review informed consent form)

Do you have any questions before we begin?

INTERVIEW QUESTIONS

1. Can you tell me about your role at the Department of Public Health? What are some of the things you do in your job?

2. We are very interested in risk factors for cardiovascular disease and stroke. What kinds of issues do you see that you think might put people at risk for these conditions?

3. What is your understanding of the relationship between stress and health?

    Probe - Are you aware of specific ways that stress translates to disease?
    Probe - Do you see a correlation between work stress and cardiovascular diseases?
    Probe - Does work stress seem like a potent contributor?

4. How do the programs you work with address these issues? For instance, is stress covered in patient-education or screening, stress reduction classes, etc.

5. Part of our role is helping provide education for health professionals about the links between work stress and cardiovascular disease. Are you and/or your public health practitioners exposed to any existing activities, materials, or publications that give more insight on the job stress and CVD? If not, what kind of activities do you think would be most helpful for public health practitioners?

6. Are there certain meetings or conferences that you attend to learn about new advances in CVD and other chronic diseases, or prevention practices?

7. Is there anything I haven't asked you that you feel is important to contribute before we conclude? Is there anyone else within MDPH whom you feel would be important for us to include in our interviews?

Work Stress and Cardiovascular Disease:
A Summary of the Evidence and Strategies for Prevention

Introduction

Cardiovascular diseases (CVD) are the leading cause of death in the United States. Together, heart disease, stroke, and related diseases are responsible for 35% of all deaths in Massachusetts (MDPH, 2003). Considerable evidence has demonstrated that occupational stress contributes to CVD morbidity and mortality. Clinicians, however, usually do not consider occupational stress as a preventable risk factor for CVD.

This document summarizes the scientific evidence that links job stress with cardiovascular disease and highlights the importance of addressing job stress as part of a coordinated public health campaign to prevent and manage cardiovascular disease. Implications for prevention practices for employers and health professionals are discussed.

What is job stress?

Job stress can be defined as the harmful physical and emotional responses that occur when the requirements of the job do not match the capabilities, resources, or needs of the worker. Job stress can lead to poor health and even injury (NIOSH 1999). Early warning signs of job stress include headache, sleep disturbances, upset stomach, difficulty concentrating, short temper, job dissatisfaction, and low morale. Longer term risks for sustained job stress include cardiovascular disease, diabetes, weakened immune function, and depression. Job stress also leads to behavioral effects such as a more passive lifestyle, smoking, and alcohol overuse.

Job stress results from the interaction of the worker and the working conditions. Although individuals vary in their responses, the National Institute of Occupational Health and Safety points to **working conditions** as a consistent set of stressors. Specific workplace features of concern include highly repetitive, monotonous tasks, excessive job demands and time pressure, racial or sexual discrimination; management style, interpersonal relationships, work roles, job insecurity, and environmental exposures such as constant background noise, or heat. One very widely used definition of stressful work is the combination of high demands with little or no leeway for decision-making about the job (also referred to as "high demand/low control" or "job strain"). A high demand with insufficient rewards (known as "effort/reward imbalance") has also been highlighted as problematic.

How common is job stress?

Twenty-nine to forty percent of U.S. workers say that their work is very or extremely stressful. One-quarter of employees view work as their primary cause of stress (NIOSH). It is estimated that up to 23 percent of heart disease related deaths per year could be prevented if the levels of job strain in the most stressful occupations were reduced to average levels seen in other occupations (Karasek and Theorell, 1990; Landsbergis et al, 1993).

What is the relationship between job stress and cardiovascular disease?

A substantial body of evidence shows a strong correlation between workplace stress and the development of cardiovascular problems such as hypertension and myocardial infarction (Belkic 2004, Landsbergis et al. 2004). Generally the correlations are stronger for men than for women, although this may be because the biggest studies have not assessed sexual harassment, work-family imbalance, and other stressors that especially affect women.

What are the mechanisms by which job stress leads to cardiovascular disease?

Work stress can trigger cardiovascular diseases (CVD) through three mechanisms, as illustrated in Figure 1. Stressful conditions on the job can result in:

1. **Changes in physiological processes** that increase the risk for CVD—high cholesterol, high blood pressure, high blood sugar, weakened immune response, high cortisol, and changes in appetite and digestive patterns.
2. **Changes in behavior** that increase the risk for CVD—low physical activity levels, excessive coffee consumption, smoking, poor dietary habits.
3. **Development of mental health conditions** (anxiety and depression) that independently increases the risk for a range of chronic health conditions, including CVD (obesity, stroke, atherosclerosis, arrhythmias, myocardial infarction, etc.).

Each of these mechanisms has been documented repeatedly in epidemiologic studies, patho-physiological studies of animals and humans, and behavioral studies.

What research supports the link between job stress and cardiovascular disease?

1) Epidemiologic Studies:

Epidemiologic studies of many different populations show that among people whose jobs are more stressful, there are higher rates of CVD, and higher rates of deaths due to CVD. International scientific literature documenting the physiological impact of stress dates back more than 30 years. In Japanese society, the term "*karoshi*" translates as a non-traumatic sudden death that is caused due to excessive work demands (non-physical). Stroke, myocardial infarction, and cardiac arrhythmia are among the fatal illnesses that cause *karoshi*.

Although we do not have an English equivalent for *karoshi*, job stress in the United States is a major health concern. There is very strong evidence that people in "high strain" jobs are particularly at risk for CVD as well as other chronic health conditions (depression, diabetes, musculoskeletal disorders, arthritis, etc.). Conversely, lower rates of CVD are observed among people in jobs with lower job strain in which employees experience good social/managerial support, a high degree of latitude in decision-making, and a sense of reward. In turn, some *intervention studies have demonstrated that physiologic indicators for CVD can be improved by changes in working conditions that reduce job stress.*

2) Patho-physiological Studies:

The direct impact of the experience of stress on physiological functions has been documented in both animals and humans. Experiments conducted on primates indicate that rank within the social hierarchy causes physiological reactions, so that those on the lower rung seem to be more sensitive to stress as compared to those at the top of the hierarchy. If researchers force a change within the hierarchy, the new positions in turn change the physiological indicators.

These experiments are relevant because higher position within the social hierarchy presumably conveys more decision latitude, which directly correlates with job strain and poor health outcomes in health studies of humans.

In an organizational context, there are a large number of job positions that involve high psychological demands but that provide low control over processes, unsatisfactory rewards or returns, and that lack good supervisory and coworker support. People working in such environments tend to have higher levels of blood cholesterol and cortisol, weaker immune systems, and appetite patterns that promote problems related to obesity and blood sugar control. All of these physiological processes increase the likelihood of developing atherosclerotic plaques in blood vessels. Plaques are the cornerstone of ischemic cardiovascular disease which leads to myocardial infarction and stroke.

3)Behavioral Studies:
A substantial number of studies demonstrate strong associations between high work stress and unhealthful behaviors such as smoking, low physical activity, and unhealthful eating habits (Kouvonen, 2007). These behaviors are known risk factors for high blood pressure, high cholesterol, and obesity, all of which are precursors to the development of cardiovascular disease. The likely mechanisms involved include time constraints (physical activity, diet quality), stress/anxiety reduction (smoking, eating patterns), psychological exhaustion, frustration and feelings of inability to improve one's environment.

What can employers do to address job stress as a risk factor for CVD?

The National Institute for Occupational Safety and Health (NIOSH) recommends a comprehensive approach that combines changes in work organization and stress management for workers to effectively address stress in the workplace. Evidence from intervention research shows clear benefits for a "systems" approach that emphasizes **primary prevention** and combines approaches for improving working conditions with approaches for managing worker illness (LaMontagne et al. 2007; NIOSH 2002).

Examples of worksite **primary prevention** activities to reduce stress exposure include:

- Clearly defining workers' roles and responsibilities
- Giving workers opportunities to participate in decisions and actions affecting their jobs
- Improving communications for bi-directional flow between workers and managers
- Providing opportunities for social interaction among workers
- Establishing work schedules that are compatible with demands and responsibilities outside the job

Secondary prevention strategies include providing training and education to employees on stress management to assist employees with coping with residual stress in the environment and reducing its harmful effects.

Examples of worksite **secondary prevention** activities to reduce stress effects include:

- Training on meditation, muscle relaxation, tai chi and other relaxation methods
- Providing physical space for meditation and other relaxation
- Providing a walking route and/or exercise space for use during work hours
- Offering periodic massage therapy at the workplace.

Tertiary prevention activities aim to help employees recover from serious ill health resulting from stress. For instance providing access to Employee Assistance Programs (EAP) helps employees deal with work place stressors which cannot be changed and non-work related stressors that impact work life.

What can health professionals do to address job stress as a risk factor for CVD?
Health professionals have a role to play for educating patients about the relationship between stress, heart disease, and other chronic illnesses. Controlling exposure and response to stressors is important for reducing the negative health consequences of stress. Education is particularly important for heart attack patients who plan to return to high-stress jobs, as these patients are at increased risk for a recurrent heart attack (Aboa-Eboule, et. al., 2007).

Health professionals can assist patients avoid the harmful effects of stress by:

- Teaching patients that stress (from occupational and other sources) is a significant risk factor for CVD and many other chronic health conditions that it warrants strategies for prevention and management.
- Screening patients for their perceptions of stress from occupational and personal sources, and referring to Employee Assistance Professionals (EAP) and/or other mental health professionals when appropriate.
- Providing patients with educational materials and resources to assist them with reducing and managing stress.
- Educating heart attack patients about the need to minimize occupational stress exposure (through shortened hours, work week, or modified job tasks, etc.) when they return to work to prevent a recurrent event.

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Figure 1: Evidence-based work stress association with cardiovascular disease
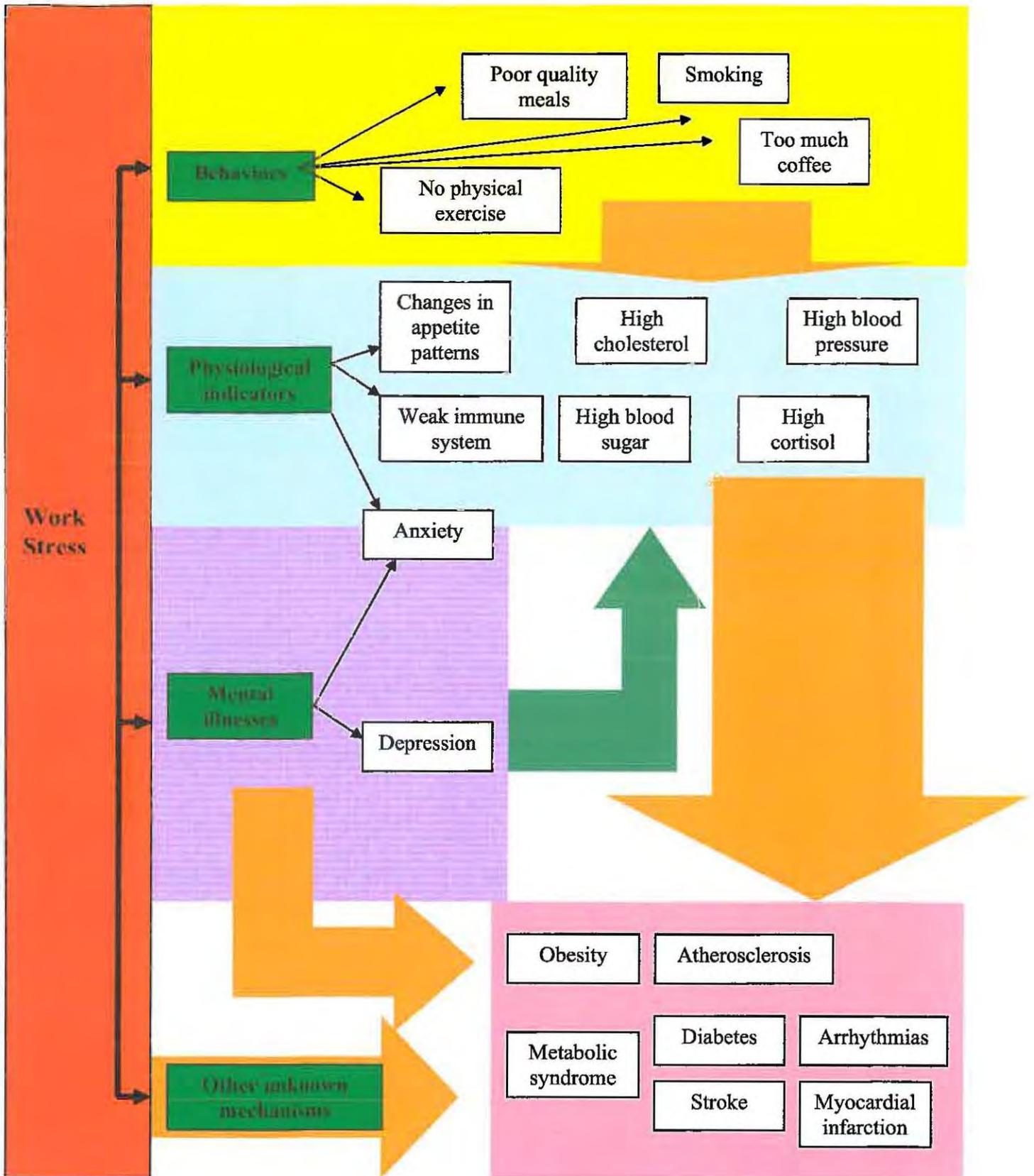
Stress@Work: Education, Translation, Communication and Dissemination Project

Health professional presentations 2006-2011

Northeast Region Medical Hospital POCT Laboratory Conference Exhibition, 2011
- Beyond breathing: Organizational approaches to reduce job stressors

Mass Association of Cardiovascular and Pulmonary Rehab Meeting, 2011
- Work, Stress, and Health: Patient risk identification and implications for patient education

Partnership for a Heart Healthy and Stroke Free Massachusetts, 5th Annual Educational Conference, 2011
- Workplace policy, systems, and environmental changes in physical activity, smoking cessation and stress reduction – current initiatives and resources in Massachusetts.

Vanguard Health Systems- Metro West Medical Center, 2011
- Work, Stress, and Health: What it means to you!

Vanguard Health Systems- St. Vincent's Hospital, 2011
- Work, Stress, and Health: What it means to you!

Vanguard Health Systems- Leonard Morse Hospital, 2011
- Work, Stress, and Health: What it means to you!

Massachusetts Department of Public Health, Working on Wellness, 2010
- Beyond breathing: Controlling workplace stressors as part of a comprehensive employee wellness program.

Ounce of Prevention Conference, 2009
- Organizational Approaches to Reducing Job Stressors

City of Lawrence Mayor's Health Taskforce annual conference: A Sound Mind for a Sound Body: Unlocking the Power to Heal, 2009
- Beyond breathing: Controlling workplace stressors as part of a comprehensive employee wellness program.

EAPA, MA/Rhode Island Chapter Annual EAPA 29th Annual Spring Symposium, 2009
- Beyond breathing: Organizational approaches to reduce job stressors.

Health Professionals Entrepreneurial Network (webinar). 2009.
- Beyond breathing: Controlling workplace stressors as part of a comprehensive employee wellness program.

Massachusetts Department of Public Health, Working on Wellness, 2009
- Beyond breathing: Controlling workplace stressors as part of a comprehensive employee wellness program.

Massachusetts Nurses Association annual workplace hazards conference, 2009

- Beyond breathing: Organizational approaches to reduce job stressors.

Partnership for a Heart Healthy and Stroke Free Massachusetts, Annual Educational Conference, 2009
- Stress, the forgotten risk factor: Public health approaches for **stress** reduction in healthcare, workplace, and community settings.

Massachusetts Department of Public Health conference: Ounce of Prevention, 2008
- Beyond breathing: Organizational approaches to reduce job stressors.

Northeast Regional Occupational Disease & Injury Surveillance Conference, 2008 "Combined Approaches to Work and Health"
- Joint meeting of Northeast states' personnel in Occupational Surveillance and Chronic Disease programs.

Partnership for a Heart Healthy, Stroke-Free MA Annual Meeting, Worcester, MA, 2006
- Work organization, stress, the changing nature of work, and cardiovascular disease

Scientific meeting presentations 2006-2011

American Psychological Association/NIOSH/Society for Occupational Health Psychology Work, Stress and Health Conference, 2009
- Perceived barriers among health professionals to addressing job stress through work organization interventions

Work, Stress, and Health Conference (APA-NIOSH-SOHP), 2008
- Facilitating inclusion of job strain issues by public health professionals.

Connecticut outreach activities 2006-2011

Ovation Benefits, Connecticut, 2011
- Exploratory discussions of future partnerships in research and training to disseminate occupational health and ergonomics content through current company disease management programs for CT employers

Northeast Regional Occupational Disease & Injury Surveillance Conference, 2011
- "Update on CPH-NEW" (Morse)

Northeast Regional Occupational Disease & Injury Surveillance Conference, 2010
- CPH-NEW research and dissemination in progress update (Nobrega)

Middlesex Chamber of Commerce and Greater Hartford Alliance, Connecticut, 2010
- Exploratory discussions of future partnerships in education and outreach with CT business community

Northeast Regional Occupational Disease & Injury Surveillance Conference, 2009
- CPH-NEW research and dissemination in progress update

CT private industry - Travelers, Ahlstrom, Pratt & Whitney, NBTY and Northeast Utilities
- Exploratory discussions with many regional and national companies about the goals of CPH-NEW and opportunities for industry based education and outreach

CT Coalition for Occupational Safety and Health, 2006
- Presentation—Job Stress and cardiovascular disease, exploratory discussions for formation of a CT based heart disease coalition

CT Department of Public Health, Division of Occupational Health Surveillance 2007
- Presentation—Job Stress and cardiovascular disease, exploratory discussions for formation of a CT based heart disease coalition

CPH-NEW Project C: Stress@Work Website

The *Stress@Work* website was developed and launched in 2009 as a cost effective way of disseminating information and education to health professionals. The content areas were guided by interview conducted with health professionals in the first years of the project, and were written specifically for use by worksite health practitioners such as worksite wellness coordinators, and employee assistance professionals. The educational objective was to address gaps in knowledge that were identified in these groups related to the evidence for job strain and CVD association, the mechanisms by which job strain increases risk for CVD, and options for intervention in the workplace. Several educational tools were identified as desirable, including fact sheets for employers (making a business case for addressing workplace stress to management, human resources professionals) and employees (describing how to manage personal stress and options for improving social support, decision latitude and skill discretion). Workplace health professionals also indicated that presentation materials would be beneficial for their use within the company, and that the website itself would be a useful addition to company intranet sites for employees. The website incorporated all of these elements, as well as provided links to many other resources for technical and non-technical audiences. Key messages and tools provided by the website are outlined below.

http://www.uml.edu/centers/cph-new/job-stress/default.html

Audience	Key Messages	Educational Tools
Worksite health personnel *Provides services to employees* *Answers to company managers*	• Stressful working conditions can raise risk for CVD, repeat MI • Incorporate stress control into wellness and ergo programs to keep employees healthy and productive. • Build a team approach to promoting a healthy workplace—be a cross functional collaborator Drivers: Employee productivity, retention Healthcare costs Justifying prevention program expenses Languaging concerns: business community does not recognize "work organization" and "job strain" as meaningful terms; stress is viewed as an essential motivator of productivity. Reject the idea that work can cause disease; fear of comp claims.	Assessment tools Presentation Brochure/fact sheet—mgt Brochure/fact sheet—employee Case studies
Workers/employees *Influences self and co-workers*	• Know your risk • Take care of your mind, body • Connect with others Drivers: Staying employed and insured Keeping healthy and safe Taking care of family Job satisfaction Languaging concerns: technical terms alienating. Stress is sign of weakness. Labor more concerned with job security, wages and health insurance than they are about safety and health.	Brochure/fact sheet--employee

The *Stress@Work* website was publicized through our Center affiliates and partners as well as internally, through UML online and print publications. Externally announcements were sent to collaborators at the Massachusetts Department of Public Health (Chronic Diseases Division, Wellness Division, and Occupational Health Program), Partnership for a Heart Healthy Stroke-Free Massachusetts coalition, and Massachusetts Rhode Island Chapter of Employee Assistance Professionals Association. Links to *Stress@Work* website were posted on several of our partner organizations website also. These include Society of Occupational Health Psychology, Massachusetts Nurses Association, Commonwealth of MA Mass in Motion (the state wellness website), and Partnership for a Heart Healthy, Stroke-Free MA. Much higher visibility and dissemination could be achieved with a professional communications plan and outreach strategy, both of which are planned for the renewal.

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Center for the Promotion of Health
in the New England Workplace

Stress@Work:
An Introduction to Job Stress

What is Job Stress? Job stress is the harmful physical and emotional responses that occur when the requirements of the job do not match the capabilities, resources, or needs of the worker.

Job stress matters to our health and our work. When we feel stressed, our bodies respond by raising the concentration of stress hormones in our blood. When our bodies continually respond to constant demands or threats, coping mechanisms stay in overdrive, which can be damaging to health over time. Research shows that excessive job stress can lead to many long-term health problems, including cardiovascular disease, diabetes, weakened immune function, high blood pressure, musculoskeletal disorders, substance abuse, depression and anxiety. Some short term signs of job stress are listed in the table to the right.

Stressful working conditions can also impact health indirectly by limiting our ability or motivation to participate in other health promoting behaviors such as eating well and exercising.

Good Stress vs. Bad Stress Stress is not always bad. Stress in the form of a challenge energizes us psychologically and physically, and it motivates us to learn new skills and master our work. When a challenge is met, we feel relaxed and satisfied. This is good stress or *eustress*. However, sometimes a challenge is turned into job demands that cannot be met. This is negative stress, or *distress*, which sets the stage for illness, injury, and job failure.

Job Stress Signs and Symptoms

Headache
Sleep disturbances
Upset stomach
Difficulty concentrating
Short temper
Fatigue
Muscle aches and pains
Over- and under-eating
Chronic mild illness
Anxiety, irritability
Depression
Gastrointestinal problems
Angry outbursts
Accidents
Substance use and abuse
Isolation from co-workers
Job dissatisfaction
Low morale
Marital, family problems

What you need to know about job stress If you work, it is likely that job stress will affect you at some point during your career. Whether you are an employee or an employer, it is important to recognize that stress in the workplace can contribute to poor health, which can lead to lower productivity, absenteeism, and higher healthcare costs. For example:

- Up to 44% of women and 36% of men want to quit their jobs because of workplace stress. This contributes to unhappiness as well as many negative health effects.
- Healthcare expenditures are nearly 50% greater for workers who report high levels of stress.
- Sixty percent of lost workdays each year can be attributed to stress.
- Job stress is more strongly associated with health complaints than financial or family problems.

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Health Effects

Studies of workers show that certain stressful job characteristics, when combined, can be particularly damaging to long term health. For instance, workers who say their jobs are very demanding (physically or mentally) and who also say they have little control over job tasks are more likely to experience health problems such as heart disease and other chronic conditions as compared with workers in jobs with lower demands and more decision-making opportunities. "Job strain" is a term that describes the combination of **high demands** and **low control**. It is "job strain" (not just feeling stressed) that is most often linked with serious health problems.

On the positive side, having a demanding job is not necessarily unhealthy, so long as you have a **control** over your work. Jobs with **high demands and high control** can be stimulating and challenging. These kinds of "active" jobs have been linked to positive health and well-being.

What can be done to design healthier jobs?

Give employees a sense of control over their work and opportunities to grow and learn new things. When designing jobs, pay special attention to these aspects of the job:

- Workstations are designed for tasks and injury avoidance
- Tasks are matched with workers' capabilities and resources
- Roles and responsibilities are clearly defined
- Job overall has meaning and a variety of tasks
- Workers can use their skills and learn new skills
- Workers can make decisions affecting their jobs
- Communication is required between co-workers and in two directions between workers and supervisors
- There are opportunities for social interaction among workers
- Work schedules are compatible with responsibilities outside the job

For more information, tools, and factsheets to address work related stress, visit the University of Massachusetts Lowell Stress@Work website:
www.uml.edu/centers/cph-new/job-stress/default.html

Examples of Work Organization Stressors

Physical stressors
Constant sitting/lack of mobility
Repetitive tasks
Fast-paced work
Rotating shifts
Insufficient breaks
Poor temperature control
Excessive noise

Psychosocial stressors
Unrealistic deadlines
Sustained, excessive workload
Excess overtime
Responsibility without authority
Job skills not used
Lack of recognition
Poor communication
Inflexible rules
Lack of input in decisions
Conflicting demands
Poor supervision
Poor relations with co-workers
Lack of respect
Dead end jobs (no promotions)
Job insecurity
Favoritism
Discrimination
Racial/sexual harassment

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Stress@Work:
The Business Case for Addressing Job Stress

Job Stress Hurts Business Workplace stress is very common, with a third of workers reporting that their work is very or extremely stressful. Stress is harmful for employees, and it also has a negative effect on the productivity and costs of organizations. Reducing workplace stressors can benefit organizations through improved retention, fewer days lost to sickness and absenteeism, fewer accidents, higher morale, improved work quality, and increased performance.

Job stress matters to our health and our work. When we feel stressed, our bodies respond by raising the concentration of stress hormones in our blood. When our bodies continually respond to constant demands or threats, coping mechanisms stay in overdrive, which can be damaging to health over time. Research shows that excessive job stress can lead to many long-term health problems including cardiovascular disease, diabetes, weakened immune function, high blood pressure, musculoskeletal disorders, substance abuse, depression and anxiety. Stressful working conditions can also impact health indirectly by limiting our ability or motivation to participate in other health promoting behaviors such as eating well and exercising.

Good Stress vs. Bad Stress Stress is not always bad. Stress in the form of a challenge energizes us psychologically and physically, and it motivates us to learn new skills and master our jobs. When a challenge is met, we feel relaxed and satisfied. This is good stress or *eustress*. However, sometimes a challenge is turned into job demands that cannot be met, and this is negative stress, or *distress*, which sets the stage for illness, injury, and job failure.

The economic consequences of job stress are real Workplace stress costs U.S. employers over $300 billion per year in accidents, absenteeism, staff turnover, lower productivity, workers' compensation awards, and medical, legal, and insurance costs.

Consider these Costs:
- 40% of job turnover is due to stress [1]
- Health care expenditures are nearly 50% greater for workers who report high levels of stress [2]
- Job stress is the source of more health complaints than financial or family problems [2]
- Replacing an average employee costs 120-200% of the salary of the position affected [3]
- The average cost of absenteeism in a large company is more than $3.6 million/year [4]
- Depressive illness, a common side effect of job stress, is associated with nearly 10 annual sick days [5]
- 25% of heart disease cases could be prevented through improvements in job design and social support in the workplace [6]

Health Effects of Job Stress Research shows that people working with high job demands and low job control experience significantly higher rates of heart and cardiovascular disease, anxiety, depression, alcohol abuse, infectious diseases, back pain, and repetitive stress injuries. Stressful working conditions can also have an indirect impact on employee well-being by limiting the ability to make positive changes to lifestyle behaviors (for example, quitting smoking, eating healthier, or starting to exercise).

The work environment plays a key role in job stress Jobs with high demands and low control are among the most harmful workplace stressors. Additional work stressors include having little social support at work and having an imbalance between the jobs efforts and rewards. Work stress can also result from conflict between demands of work and home life.

What You Can Do Assess and intervene on multiple levels – organization, work groups, individuals – to have a substantial and positive impact on your business goals and your workforce. <u>Prevention is essential</u> if you want to improve productivity, quality, health care costs and morale. Follow these tips to create a healthy and productive work environment:

1. **Commit** to creating a healthy workplace, free from physical and psychological harm.
2. **Integrate** work environment issues with the company health and wellness program; expand your view of work policies, work organization, and job design as "health" issues.
3. **Engage** employees in stress related risk identification and problem solving.
4. **Support** continuous quality improvement of the work environment by providing a structure and budget for coordination and implementation of new initiatives.

For more information, tools, and factsheets to address work related stress, visit the
University of Massachusetts Lowell Stress@Work website:
www.uml.edu/centers/cph-new/job-stress/default.html

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Unifying Principles of the Center

- Systems-level, environmental approaches are vital for effective health promotion

- Health behavior is influenced by both environment and personal characteristics

- Workplace improvements should reduce hazards <u>and</u> empower decision-making

- Employee participation is a key element

3

Stress@Work Project

Goal:

- To increase health professionals' knowledge about how to incorporate job stress prevention strategies into chronic disease prevention programs

Activities:

- Qualitative Data Collection
- Conference Presentations
- Educational Materials
- Website: Coming in Summer 2009
  - www.uml.edu/centers/cph-new/stress@work

Disclaimer

- I am not an EAP….Fit what I'm saying into what you know to be true in your experience…
- My training….
- My discipline….
- 90 minutes…..
- I am more in the practitioner camp than the academic one!
- Practice enhanced by theory, not ruled by it!

Ripped from the Headlines...

Heart Attack, eh? – Boss May be Cause
- Boston Globe, November 2008

Stress Triggers Heart-Damaging Behavior
- US News and World Report, December 2008

The Ailing Economy is Making People Sicker
- Boston Globe, January 2009

EAP Literature

- Job Stress A Concern?
  - Often connected to other issues (alcoholism, absenteeism, etc.)
  - Traditional paradigm (individual help for individuals with issues).
  - Ecological approach mentioned (goodness of fit between the worker and the environment).
  - Several articles mention relationship of stress and CVD

8

EAP Literature

- Organizational/Environmental causes of stress?
  - Downsizing
  - Globalization
  - Restructuring
  - Overwork
  - Changing roles
  - 24 hour work commitment
  - Mandatory OT
  - Technology
  - Workload

EAP Literature

- Interventions to Control Job Stressors?
  - Individual level interventions highlighted
    - Relaxation response
    - Individual counseling
    - Referrals to Psych. Services
  - Title of Article- "De-stress the Workforce"
    - Emphasis on the worker adaptation to the stressors
  - Interventions should ideally focus on work organizations as well as individuals, but argues that contracting out EAP services limits them to individual level interventions (Nissly, 2002).

More....

- Interventions to Control Job Stressors?
  - Some acknowledge that traditional EAP activities are not sufficient to address stress in the workplace.....must be complemented...(McHugh, 1992).
    - Organizational culture
    - Job design
    - Management style
    - Work hours
  - Org. interventions to reduce stress among CPAs
    - Clear communication and feedback
    - Limited OT
    - Schedule flexibility

More....

- Interventions to Control Job Stressors?
    - Colligan (2005) thorough review of work environment causes of stress (includes Karasek), and implores managers to reduce stress by addressing changes in workload and autonomy.
    - Shain (1996) calls for "working environment" committee (EAP, OHS, and HP).
    - Beidel (2005) goes a step further..."inject EA Services into the very 'business core' of the organization". (examples internal)
    - Role conflict discussed (Greenwood, 1997)
        - Disputed territory between therapist, personnel manages, and financial officers for the company.

12

Qualitative Findings

- Interviews with ~ 30 "health professionals"

  (public health personnel, EAP, worksite wellness, cardiologists)

- Main themes:

  - Recognition "stress" as risk factor for disease

  - Low knowledge about causal association between work stressors and disease

  - Perception of work organization as *outside* of their traditional domain

  - High interest in evidence-based intervention strategies

EAP Themes

- Stress is dominant cause for initiating EAP contact

- Work-related stress easily recognized as a risk factor for CVD

- EAP primary role—assist individual employees to return to productivity; less common to improve psychosocial conditions for broader workforce

- Control within the organization depends on: past experience with client company; internal or external EAP; presence of unions

Workload in America 2009

Table 1: Workload and Stress Trends (March 2008 – March 2009)

Workload and Stress Trends	Decreased	Stayed About the Same	Increased
Managers' workloads	2%	16%	83%
Employee stress	10%	11%	79%
Employees' workloads	2%	19%	79%
The speed at which tasks are expected to be completed	2%	32%	66%
The demands of managing globally	8%	47%	46%
Innovation	19%	46%	36%
Employee productivity	22%	52%	27%
Quality products and services	11%	69%	20%
The size of the organization's workforce	50%	35%	16%
Employee energy and endurance	46%	42%	12%
Employee motivation	50%	38%	12%
Employee morale	70%	24%	6%

Approaches that Make Sense....
(to some)

- ## Precede-Proceed
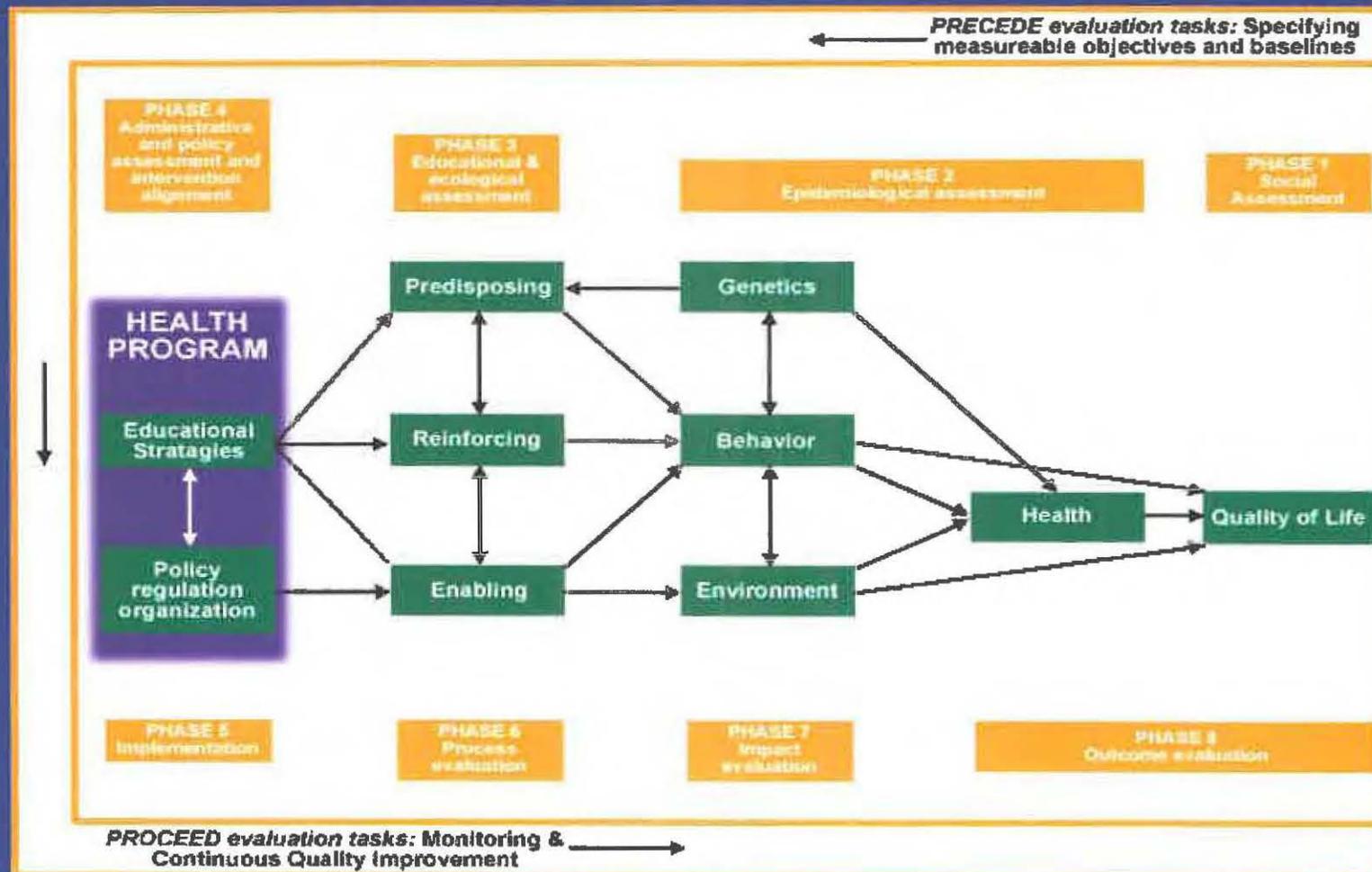
Approaches that Make Sense…. (to others)

The Bottom Line

- $3 to $6 return on investment for every $1 spent
  - Over 2-5 years
- Increase in premiums only 4.9%
  - national avg. 12.7%
- Cost per employee for healthcare $3052
  - National avg. $6900 for manufacturing employees

(Koffman, et al., 2005).

18

Sociologic Model for Health Promotion

Individual
- Eat well
- Exercise
- Don't smoke
- Manage Stress

Interpersonal
- Social support
- Fitness partners

Institutional
- Healthy foods
- Fitness facility

Community
- Rail trails
- Sidewalks in good repair
- Quality recreation areas

Policy
- Trans fat bans
- Smoke free workplaces

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Stress 101

Stressor $\longrightarrow$ Stress $\longrightarrow$ Strain $\longrightarrow$ Symptoms $\longrightarrow$ Illness

Behavior

Types of Job Stressors: Physical

- Poor indoor air quality
- Ergonomic stressors
- Hazardous waste exposure
- Inadequate equipment

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Types of Job Stressors: High Demand

- Heavy workload
- Unrealistic deadlines
- Conflicting demands
- Inadequate amount of time to complete tasks
- Repetitive Tasks
- Excessive/mandatory overtime

Types of Job Stressors: Low Control

- Responsibility without authority
- Job skills not used
- Dead-end jobs
- Job insecurity
- Lack of input in decisions

"I've called the family together to announce that, because of inflation, I'm going to have to let two of you go."

Types of Job Stressors:
Low Social Support

- Poor relations with co-workers
- Poor relations with management
- Lack of family support
- Racial/sexual discrimination
- Lack of recognition

Survey: Do You Have Job Strain?

Demand	YES	NO
I have to work very hard	☐	☐
I am asked to do an excessive amount of work	☐	☐
I do not have enough time to get my work done	☐	☐

Control		
I get to do a variety of things in my job	☐	☐
I have a job which allows me to be creative	☐	☐
I have a job which allows me to learn new things	☐	☐
I have a lot of say about what happens	☐	☐
I have a lot of freedom to decide how I do my work	☐	☐

Social Support		
I work with helpful people	☐	☐
I work with people who take a personal interest in me	☐	☐
My supervisor is helpful	☐	☐
My supervisor is concerned about my welfare	☐	☐

Scoring

Calculate a separate score for each of the three parts (demand, control, and social support). In each part, give yourself one point for every 'yes' answer. On the blank lines below, write the word that describes each score:

My job demand is:
If you scored 0-1, write 'low'; 2-3, write 'high' _____

My control at work is:
If you scored 0-2, write 'low'; 3-5, write 'high' _____

My support at work is:
If you scored 0-1, write 'low'; 2 write moderate; 3-4, write 'high' _____

Stress: Demands, Control & Support

How Does Job Stress Affect Our Health?

- Early warning signs of job stress include:
  - Headache, sleep disturbances, upset stomach, difficulty concentrating, short temper, job dissatisfaction, and low morale

- Long-Term risks for sustained job stress include:
  - **Cardiovascular diseases**, diabetes, weakened immune function, musculoskeletal disorders, and depression.

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Figure 1: Evidence-based work stress association with cardiovascular disease

32
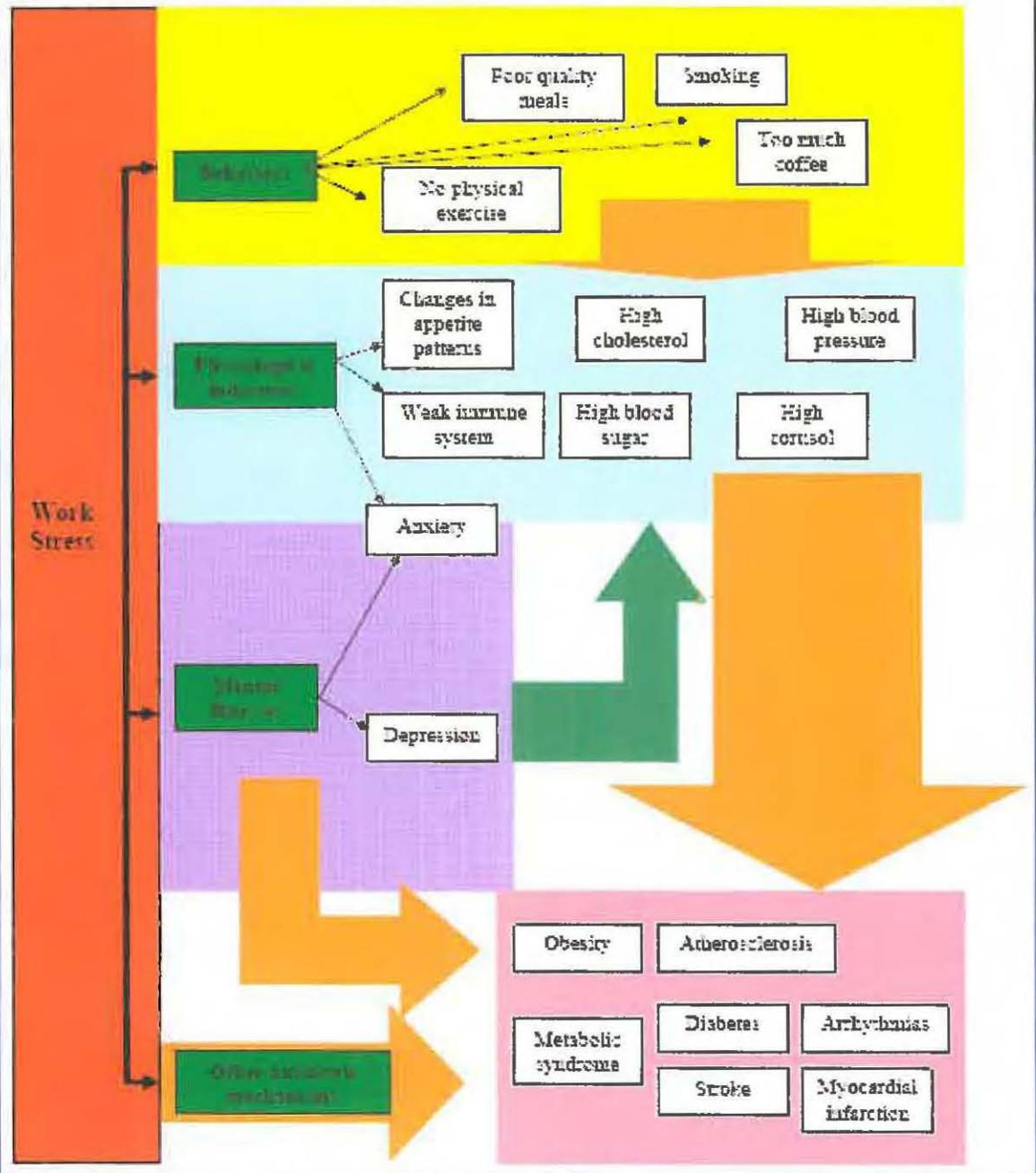
Job Stress Experience

■ Is "stress-free" the goal?

■ What's the most desirable profile of a job?

Addressing Job Stress

Tertiary Prevention:

- Tertiary Interventions are <u>reactive</u>, and aim to minimize the effects of stress-related problems once they have occurred.

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Examples of Tertiary Prevention

- Organizational Strategies
  - Employee Assistance Programs
- Individual Strategies
  - Utilize Employee Assistance Programs
  - Psychological Counseling/therapy
  - Traumatic Event Debriefing
  - Medical care and Treatment

Addressing Job Stress

- Secondary Prevention:

- Secondary interventions aim to modify an individual's response to stressors.

Examples of Secondary Prevention

- Organizational Strategies
  - Team Building
  - Diversity Programs
  - Worker education and training
  - Access to fitness facilities/walking paths
- Individual Strategies
  - Good Nutrition
  - Physical Activity
  - Meditation
  - Social/Emotional Outlets
  - Assertiveness Training

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Addressing Job Stress

- **<u>Primary Prevention</u>:**

Proactive actions taken by an organization that aim to <u>prevent</u> illness among individuals.

Examples of Primary Prevention

- Organizational Strategies
  - Clearly defining workers' roles and responsibilities
  - Workload matches workers' capabilities and resources
  - Job Redesign
  - Worker participation in decisions and actions affecting their jobs
  - Work schedules compatible with demands/responsibilities outside the job
  - Improving ergonomics and work/environmental design
  - Improving communications between workers and managers
  - Career Ladders

- Individual Strategies
  - Lifestyle Management
  - Manage perceptions of stress

Organizational vs. Individual

- Organizational changes should be top priority

- Even the most conscientious efforts to improve working conditions are unlikely to eliminate stressors *completely* for all workers.

- GOLD STANDARD

  - a combination of organizational change and individual stress management is often the most useful approach for preventing and addressing stress at work.

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Applying a comprehensive approach
What does it look like?

- **Individual centered strategies**

  (improve coping skills—relaxation, time mgt)

- **Individual-organizational interface**

  (job and workgroup level—social support, role clarification, communication, conflict resolution)

- **Organizational level**

  (physical and social environments, policies)

Stress Scenario #1

- You have been employed at a local community health center for 10 years. A year ago a new management team came on board and has revamped many of the operations associated with your division, without the input from the long standing members of the team. Communication between the management team and everyone else is non-existent and morale is as low as ever. Over the last six months you've grown to loath going to work, have had a short fuse with your spouse and children, and have trouble sleeping. What can be done?

Stress Scenario #2

- You are a supervisor of a group of 10 working within a healthcare facility. Recently, a valuable employee came to you and reported that they would be leaving the facility. Surprised, you ask the person what motivated them to move on. Even more surprising to you, the employee went on to share some feedback you wished you'd received sooner. Specifically, the person reported people feeling like they were consistently put into situations where they were "in over their heads", any feedback they offered was often dismissed, the dynamics of the work group was dysfunctional (specifically some bias toward a non-Christian employee), and that people didn't perceive you to be very approachable. You vow to not let this happen to another member of your group. What can you do?

Analysis of the Stress Scenarios

1. What is the main source of stress in the situation?

2. What can be done from an organizational point of view to address the situation that is causing the stress?

3. How can you involve others in the problem solving?

4. What individual strategies can you implement to cope with the stressor presented?

SWOT Analysis:
EA Services and Organizational Change to Reduce Work Stressors

Successful interventions:

- Involve workers at all stages of the intervention
- Provide workers with the authority to develop, implement, and evaluate the intervention
- Commitment from top management and buy-in from middle management
- Organizational culture that supports stress interventions
- Periodic evaluations of the intervention

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Conclusion

- Job stress is a tangible risk factor for the development of many chronic diseases.

- Approaches have tended to be in the area of individual stress management.

- Organizational approaches coupled with individual strategies is the most effective way to address job stress.

Acknowledgements

- Thanks to:
  - Co-PI- Suzanne Nobrega
  - Former PI- Lenore Azaroff
  - Research Assistant- Julie Brodie
  - Peter Sullivan
  - MA/RI EAPA
  - All of you!!

Stress@Work Contacts

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Nicole_Champagne@uml.edu

Stress@Work website coming in summer 2009!

Massachusetts Department of Public Health

Wellness Toolkit, Worksite Health Improvement Survey

Lisa.Erck@state.ma.us

www.mass.gov/massinmotion/

MDPH Worksite Toolkit

Resources

- American Psychological Association
  www.apahelpcenter.org
- NIOSH Stress at Work
  www.cdc.gov/niosh/pdfs/stress
- UMass Lowell CPH-NEW
  www.uml.edu/centers/cph-new/job-stress

Beyond Breathing: Institutional Approaches to Reducing Job Strain
Evaluation Form
MNA Workplace Hazards Conference
June 4 & 5, 2009

A. Were the learning objectives met with regard to your ability to do the following?
(circle one choice for each objective)

	1 Unmet	2 Partially Unmet	3 Un- decided	4 Partially Met	5 Met
Objective #1 – Explain the impact of job stress on risk for cardiovascular and other chronic diseases	1	2	3	4	5
Objective #2 – Describe the challenges associated with addressing work organization and/or culture to achieve a healthier work environment	1	2	3	4	5
Objective #3 – Evaluate several strategies for reducing job strain at the organizational level	1	2	3	4	5

B. Please respond as to whether you agree or disagree with the following statements
(circle one choice for each statement)

	1 Strongly Disagree	2 Dis- agree	3 Un- decided	4 Agree	5 Strongly Agree
1. This presentation met my personal learning objectives	1	2	3	4	5
2. The educational components were clear and well organized	1	2	3	4	5
3. I learned something new from this presentation	1	2	3	4	5
4. Opportunity for discussion was provided and useful	1	2	3	4	5
5. The content presented was relevant to my practice or services provided	1	2	3	4	5
6. The site and its facilities enhanced learning	1	2	3	4	5
7. This conference will have a strong positive impact on the way I practice	1	2	3	4	5
8. Handouts and other supplementary materials were provided and useful	1	2	3	4	5
9. The overall quality of this presentation and its educational content were high	1	2	3	4	5

C. Please provide any additional comments below.

What are the most important barriers you see for implementing institutional strategies to control **stress** in your workplace?

Is there anything you would have liked to see in this presentation that was not covered? Please explain.

Thank you for taking the time to provide feedback on this presentation

Health-Related Website Evaluation

This evaluation instrument from the Rollins School for Public Health is for health educators and clinicians to use to evaluate the appropriateness of web sites for their clientele for further health education. Please take a few minutes to browse the Stress@Work website before completing the evaluation form.

I. Web site information

Title of site: Stress@Work

Web site address: http://www.uml.edu/stage/centers/cph-new/job-stress/default.html

Please circle the number which you feel best represents the site: 1= disagree, 2= agree, 0= not applicable (N/A).

	Disagree	Agree	N/A
II. Content			
1. The purpose of the site is clearly stated or clearly apparent.	1	2	0
2. The information covered does not appear to be an "infomercial" (an advertisement disguised as health education).	1	2	0
3. There is no bias evident.	1	2	0
4. If the site is opinionated, the author discusses all sides of the issue, giving each due respect.	1	2	0
5. All aspects of the subject are covered adequately.	1	2	0
6. Information is unique to other workplace stress information available on the web.*	1	2	0
7. External links are provided to fully cover the subject.	1	2	0
Comments on Content:			
III. Accuracy			
8. The information is accurate (if not sure, circle 0).	1	2	0
9. Sources are clearly documented.	1	2	0
Comments on Accuracy:			
IV. Currency			
10. The date of publication is clearly posted.	1	2	0
11. The revision date is recent enough to account for changes in the field.	1	2	0
Comments on Currency:			
	Disagree	Agree	N/A

V. Authorship			
12. The site is sponsored by or is associated with an institution or organization.	1	2	0
13. For sites created by an individual, author's/editor's credentials (educational background, professional affiliation, certifications, past writings, experience) are clearly stated.	1	2	0
14. Contact information (email, address, and/or phone number) for the author/editor or webmaster is included.	1	2	0
Comments on Authorship:			
VI. Audience			
15. The type of audience the author is addressing is evident (academic, youth, minority, general, etc).	1	2	0
16. The level of detail is appropriate for the audience.	1	2	0
17. The reading level is appropriate for the audience.	1	2	0
18. Technical terms are appropriate for the audience.	1	2	0
Comments on Audience:			
VII. Navigation			
19. Internal links add to the usefulness of the site.	1	2	0
20. Information can be retrieved in a timely manner.	1	2	0
21. A search mechanism is necessary to make this site useful.	1	2	0
22. A search mechanism is provided.	1	2	0
23. The site is organized in a logical manner, facilitating the location of information.	1	2	0
24. Any software necessary to use the page has links to download software from the internet.	1	2	0
Comments on Navigation:			

III. Additional Feedback:

Thank you very much for your participation in this evaluation of the new Stress@Work website!

Retrieved from http://www.sph.emory.edu/WELLNESS/abstract.html
*Question added by CPH_NEW- Not part of the original Emory tool

Total score _____

Total number of possible points _____

Percentage of total points _____

To calculate the web site's score, the total points scored must be added up as well as total points possible. Total points possible is defined as the number of questions answered as either agree or disagree multiplied by two. The total score must then be divided by the total number of points possible to determine the overall rating of the web site.

Total score/Total number of possible points = percentage of total points
For example, if 30 out of 36 questions were answered with either disagree or agree, then the total number of points possible is 60 (30 multiplied by 2). If the total points scored was 54, then divide 54 by 60 (the total points possible). The overall rating of the web site is 90%, which falls into the excellent range.
Total score: 54
Total number of possible points: 30 x 2 = 60
Percentage of total points: 54/60 = 90%
Rating of web site: Excellent

Score	Rating
At least 90% of total possible points.	**Excellent**: This web site is an excellent source of health information. Consumers will be able to easily access and understand the information contained in this site. Do not hesitate to recommend this site to your clientele.
At least 75% of total possible points.	**Adequate**: While this web site provides relevant information and can be navigated without much trouble, it might not be the best site available. If another source cannot be located, this site will provide good information to your clientele. Care should be taken to discuss with your clientele what information was found on this web site and what information is still needed.
Less than 75% of total possible points.	**Poor**: This site should not be recommended to your clientele. Validity and reliability of the information can not be confirmed. All information on the site might not be accessible. Look for another web site to prevent false or partial information from being read.

Retrieved from http://www.sph.emory.edu/WELLNESS/abstract.html

*Question added by CPH_NEW- Not part of the original Emory tool

Tentative Agenda

"Combined Approaches to Work and Health" May 6 & 7, 2008
Homewood Suites Hotel, Farmington, CT

Monday, May 5, 2008: Occupational Disease Surveillance Conference begins (agenda TBD)

Tuesday, May 6

10-11:00 a.m. Welcome and purpose of joint meeting –
Current initiatives to integrate Occupational Health and Safety and workplace
based Chronic Disease programs in New England: CPH-NEW and NY State

11am -12 pm Presentations
Job stress & chronic diseases – Paul Landsbergis
Worksite Health Promotion effectiveness –

12 -1 pm LUNCH (state-by-state discussion tables)

1-1:30 pm Stimulating organizational change to improve OHS and HP outcomes; strategies
for getting top management buy-in

1:30-2:45 pm Workshops: Opportunities for OHS and HP collaboration

- Musculoskeletal health: Ergonomics, obesity, activity
- Lung health: Asthma, smoking, indoor air quality
- Cardiovascular health: Job stress, obesity, nutr./activity

2:45-3 pm BREAK

3-3:30 pm Wrap up for OHS surveillance conference

3:30-5 pm Chronic disease program resource sharing
(10 minute state-by-state presentations, then discussions)

5:00 pm Adjourn and dinner

Wednesday May 7

8:30-10:00 Current Health Promotion Activities- What are Northeast States Doing?
(10-15 minute state-by-state presentations on current activities/scope of
project/success stories/obstacles)

10:00-10:15 BREAK

10:15-11:15 Program Integration (Maine/ RI)

12/21/07

11:15-12:00   Culture of Health
  • Creating a supportive worksite environment that fosters optimal employee health (comprehensive breastfeeding program (RI)
  • Evidence Based policies

12:00-1:00   Lunch

1:00-2:00   "Recognition/Awards Programs" – Brainstorm elements and criteria for award and recognition programs and share existing awards programs (Everett Koop Awards, WELCOA etc).

2:00-2:45   Surveys and Assessment or ROI (TBD by Group)

2:45-3:00   Wrap Up and Adjourn

For more information: Tim Morse, UConn Health Center, 860-679-4720 or tmorse@uchc.edu or Lisa Erck, MA Dept. of Public Health, 617.624.5409 or Lisa.Erck@state.ma.us

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Educational Conference

Massachusetts
Partnership for
Healthy Weight

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Stress: The Forgotten Risk Factor
Applying Public Health Approaches to Reduce Stress in
Healthcare, Worksite, and Community Settings

January 30, 2009
8:00 a.m. - 3:30 p.m.
Beechwood Hotel, Worcester, MA

**Vincent Felitti, MD
Clinical Professor Medicine
Department of Preventative Medicine
Kaiser Permanente Medical Care Program
San Diego, CA
Co-Principal Investigator of the
Adverse Childhood Experiences (ACE) Study**

Keynote Address:
"Adverse Childhood Experiences & Their Relation
to Adult Health, Disease, & Social Function"

**Peter Schnall, MD, MPH
Clinical Professor of Medicine
University of California, Irvine
Director, Center for
Social Epidemiology**

Keynote Address:
"Work Stress: Causes,
Consequences, and Cures"

Plenary viewing and facilitated discussion of
"Place Matters" segment of *Unnatural Causes* documentary

For information on CME-CEU credits, please see our website:
www.HeartStrokeMA.org

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Third Annual
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Partnership for
Healthy Weight

Co-Sponsor

Stress: The Forgotten Risk Factor
Applying Public Health Approaches to Reduce Stress in Healthcare, Worksite, and Community Settings

January 30, 2009
8:00 a.m. - 3:30 p.m.
Beechwood Hotel, Worcester, MA

AGENDA

Conference objectives:
- Recognize environmental stressors and how one's responses to stress can lead to chronic diseases.
- Develop intervention strategies in healthcare, workplace, and community settings to prevent or reduce exposure to stress and its harmful effects.
- Identify resources to help address stress as a risk factor in current chronic disease prevention efforts.

Masters of Ceremonies: Andrea Laskey and Kathy Foell
                          PHHSFM Executive Committee Co-Chairs

8:00-8:45   Registration and Continental Breakfast

8:45-9:00   Welcome: **John Auerbach**, Commissioner,
                MA Department of Public Health

9:00-10:00   **Vincent Felitti**, MD, Clinical Professor of Medicine, Department of Preventative Medicine, Kaiser Permanente Medical Care Program, San Diego, CA; Co-Principal Investigator of the Adverse Childhood Experiences (ACE) Study
                "Adverse Childhood Experiences and Their Relation to Adult Health, Disease, and Social Function"

10:00-11:00   **Peter Schnall**, MD, MPH, Clinical Professor of Medicine, Division of Occupational and Environmental Medicine, University of California, Irvine; Director, Center for Social Epidemiology
                "Work Stress: Causes, Consequences, and Cures"

AGENDA continued

11:00-11:30   Break – Get up, stretch, and walk around while visiting
               exhibits, networking with colleagues, and getting a snack.

11:30-12:15   Viewing of "Place Matters" segment of
               Unnatural Causes documentary
               Discussion facilitated by Elmer Freeman, MSW
               Executive Director, Center for Community Health
               Education Research and Service (CCHERS), Roxbury, MA

12:15-12:30   Introduction of guided meditation activity

12:30-1:30   Lunch – Networking – Exhibits
               Guided Meditation available with **Sarlon Lancraft**, YWCA
               Central Massachusetts

1:30-3:30   Workshops

Workshop Objectives:
- Describe examples of primary, secondary, and tertiary prevention strategies
  for stress control in the pertinent setting.
- Discuss a locally implemented program that aims to reduce disease risk by
  controlling stress exposure and/or effects.
- Identify at least two resources available to assist with incorporating stress
  control into existing chronic disease prevention programs.
- Determine whether next steps are needed to help participants address stress
  in their setting.

Choose one of three:

Healthcare: Strategies for using ACE in healthcare settings to identify
                   and improve care for patients at risk for chronic disease

                   Vincent Felitti, MD, with **Valli Geiger**, Director of
                   Quality, Maine Primary Care Association

Workplace: Workplace strategies for reducing stress – organizational
                   approaches beyond wellness programs

                   Peter Schnall, MD, MPH, with **Kathryn Brooks**, Vice
                   President, Human Resources and Organizational
                   Development, Green Mountain Coffee Roasters, Inc.

Community: See next page

AGENDA continued

Community: Place Matters: Community response and action in Massachusetts—where the rubber meets the road

Facilitator: Peter Lee

Panelists:

Clara Savage, EdD, Coordinator, Common Pathways, Worcester, MA

Elmer Freeman, MSW, Executive Director, Center for Community Health Education Research and Service (CCHERS), Roxbury, MA

E. Vicente Sanabria, MS, CED, Central MA Center for Healthy Communities, Worcester, MA

Thomas J. Collins, Jr., Executive Director, Fall River Housing Authority, Fall River, MA

Each workshop will conclude with a discussion of resources for further action and recommendations for next steps.

Evaluations will be completed in the breakout rooms.

3:30 Adjournment

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Third Annual
Educational Conference

January 30, 2009
Beechwood Hotel, Worcester, MA

Stress: The Forgotten Risk Factor
Applying Public Health Approaches to Reduce Stress in Healthcare, Worksite, and Community Settings

THANK YOU TO OUR GENEROUS SPONSORS

Nonprofit Conference Co-Sponsor:
**Massachusetts Partnership
for Healthy Weight**

Speaker Sponsor: Vincent Felitti, MD
**Massachusetts Department of Public Health:
Division of Violence and Injury Prevention
Bureau of Substance Abuse Services
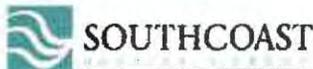Heart Disease and Stroke Prevention and Control Program**

Speaker Sponsor: Peter Schnall, MD, MPH
**University of Massachusetts Lowell,
Department of Work Environment**

UMASS LOWELL

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Lahey
CLINIC

Massachusetts Health Council

Nonprofit Conference Partner:
Massachusetts Health Council

Directions to the Beechwood Hotel
363 Plantation Street, Worcester, MA
508-754-5789

For map and complete directions log onto:
http://www.beechwoodhotel.com/about-our-hotel/map-directions/

From the East on I-90 (Mass Pike):
- I-90 West to Exit 11A (Rt. 495 North).
- Rt. 495 North to Exit 23B (Rt. 9 West).
- Rt. 9 West approximately 10 miles; cross over bridge into Worcester.
- At 2nd traffic light, turn right onto Plantation Street.
- At 1st traffic light, turn left into Biotech Park.
- Turn into the Beechwood Hotel, 2nd driveway on the left.

From the West on I-90 (Mass Pike):
- I-90 East to Exit 10 (I-290 East).
- I-290 East to Exit 17 (Rt. 9 Framingham/Ware).
- At end of ramp, turn right.
- At 4th traffic light, turn left onto Plantation Street.
- At 1st traffic light, turn left into Biotech Park.
- Turn into the Beechwood Hotel, 2nd driveway on the left.

From the North on Rt. 495:
- Rt. 495 South to Exit 25B (I-290 West).
- I-290 West to Exit 22.
- At end of ramp, turn right.
- At 2nd traffic light, turn left onto Plantation Street.
- At 1st traffic light, turn left into Biotech Park.
- Turn into the Beechwood Hotel, 2nd driveway on the left.

From the North on I-190:
- I-190 South, merge onto I-290 East (on the left).
- I-290 East to Exit 21 (Plantation Street).
- At end of ramp, turn right.
- At 3rd traffic light, turn right into Biotech Park.
- Turn into the Beechwood Hotel, 2nd driveway on the left.

From the South—various locations, chose from:
- Rt. 128 North to I-90 West (Mass Pike) - see above.
- Rt. 146 North to I-90 East (Mass Pike) - see above.
- I-84 East to I-90 East (Mass Pike) - see above.

A NIOSH Center for Excellence to Promote a Healthier Workforce

Beyond Breathing:
Controlling workplace stressors as part of a comprehensive employee wellness program

Working on Wellness, November 3, 2010

Suzanne Nobrega, MS
Nicole J. Champagne, Ed.D.

University of Massachusetts, Lowell

CPH-NEW: Unifying Principles

- Systems-level, environmental approaches are vital for effective health promotion

- Health behavior is influenced by both environment and personal characteristics

- Employee participation is a key element of workplace ergonomics and health promotion

Ripped from the headlines…

Heart Attack, eh? – Boss May be Cause

Mr. Burnses of the world can raise workers' risk of cardiac woes, study says, Boston Globe, Nov. 2008

Stress Triggers Heart-Damaging Behavior

Study found the dynamic raised cardiovascular risks by 50% US News and World Report, Dec. 2008

The Ailing Economy is Making People Sicker

Doctors see rise in stress, drop in healthy habits

Boston Globe, Jan. 2009
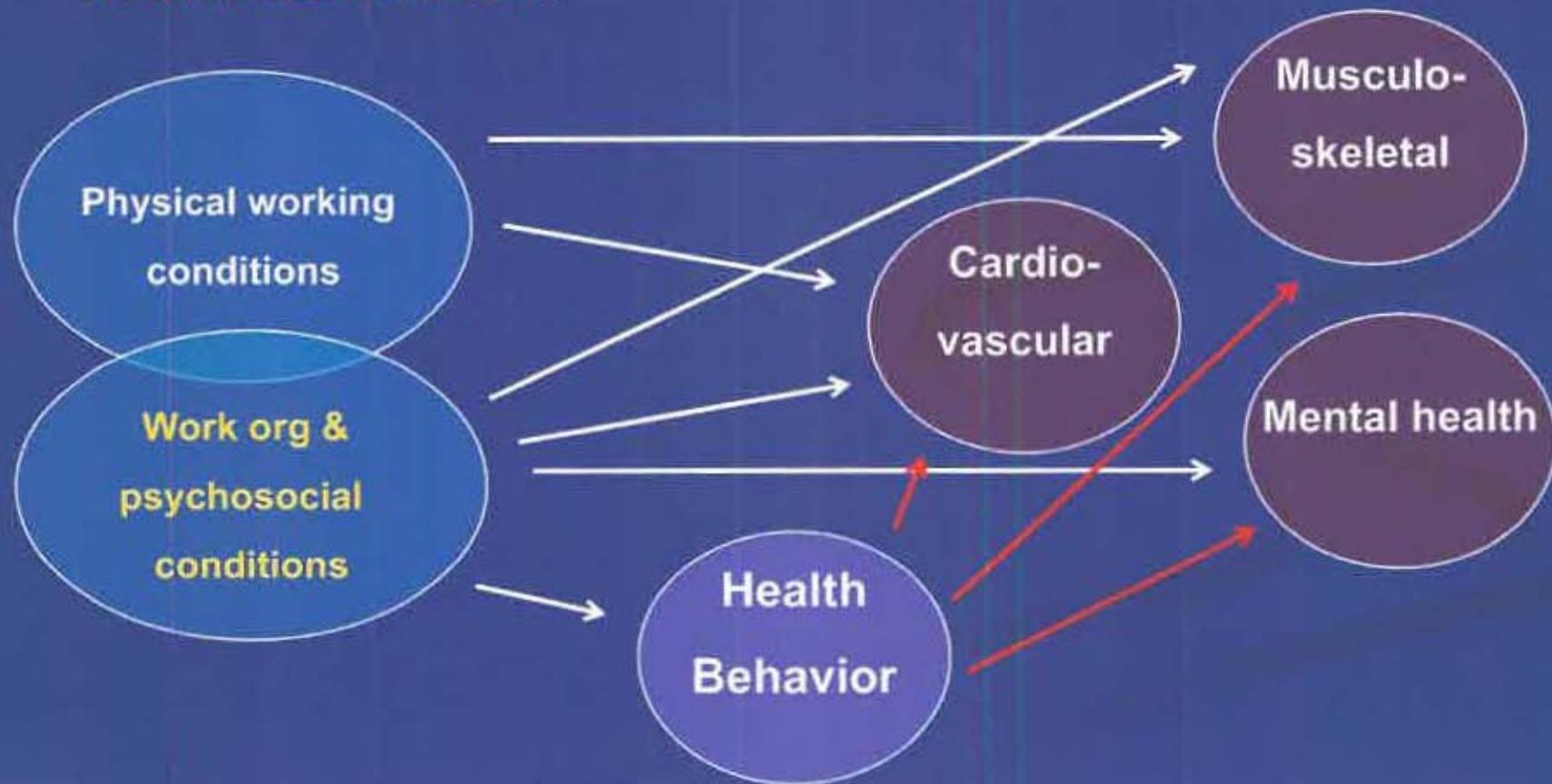
Types of Job Stressors: Physical

- Poor indoor air quality
- Ergonomic stressors
- Hazardous waste exposure
- Inadequate equipment

Types of Job Stressors:
High Demand

- Heavy workload

- Unrealistic deadlines

- Conflicting demands

- Inadequate amount of time to complete tasks

- Repetitive Tasks

- Excessive/mandatory overtime

Types of Job Stressors: Low Control

- Responsibility without authority
- Job skills not used
- Dead-end jobs
- Job insecurity
- Lack of input in decisions

"I've called the family together to announce that, because of inflation, I'm going to have to let two of you go."

Types of Job Stressors: Low Social Support

- Poor relations with co-workers
- Poor relations with management
- Lack of family support
- Racial/sexual discrimination
- Lack of recognition

Stress: Demands, Control & Support

TYPICAL MEASURES OF JOB STRESSORS IN RESEARCH STUDIES

- **Work schedules**
  - Long work hours
  - Rotating, night shifts
- **Job characteristics**
  - High job demands-low job control ("job strain")
  - High effort-low reward jobs
  - Low social support
  - Threat-avoidant vigilant work
- **Work organization**
  - Poor safety culture, climate
  - Incentive or "piece-rate" pay systems
  - Electronic surveillance or performance monitoring
  - Discrimination, harassment, bullying
  - Lack of supports for work-family balance

4

Adjusted hazard ratios for cardiovascular mortality by levels of work stress[#]

Nmax=812 (73 deaths); mean follow-up 25,6 years
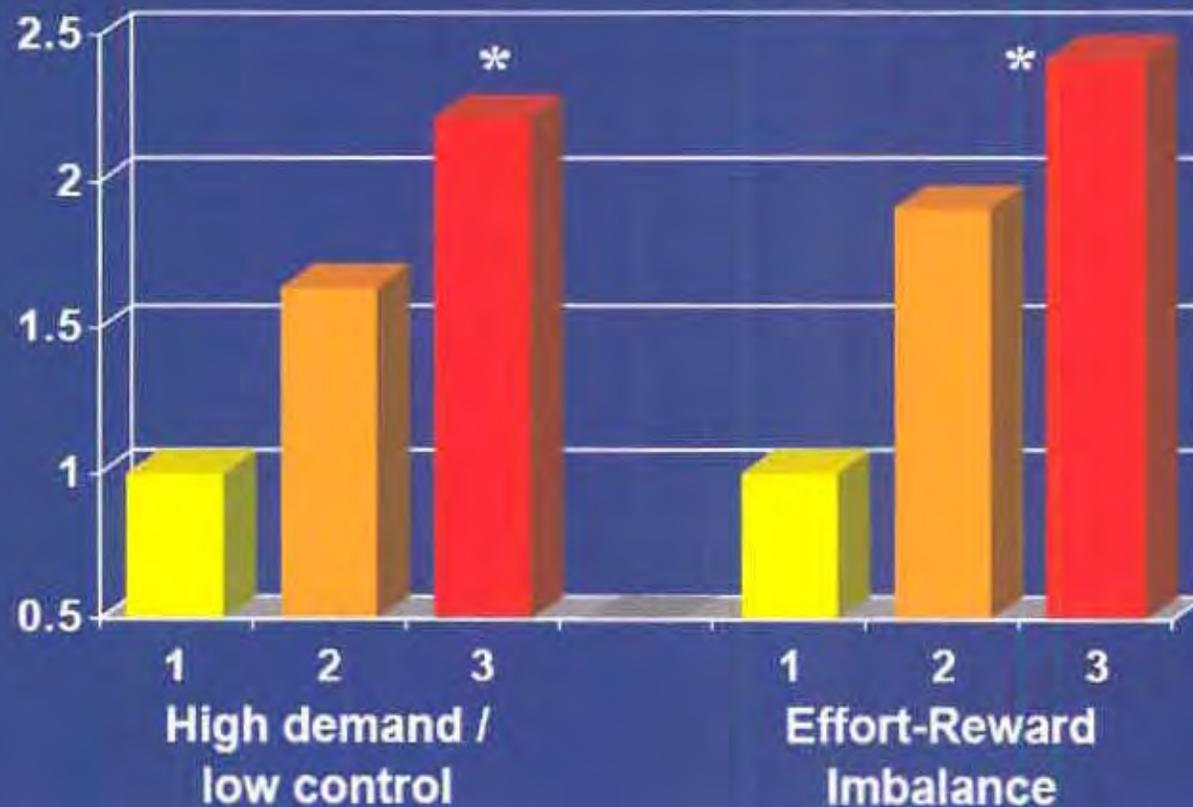
Tertiles
1 = low;
2 = intermediate;
3 = high

[#]adj. for age, sex, occupational group, smoking, physical activity, SBP, total chol., BMI

* p < .05

High demand / low control

Effort-Reward Imbalance

Source: M. Kivimäki et al. (2002), BMJ, 325: 857

25

How Does Job Stress Affect Our Health?

- Early warning signs of job stress include:

    Headache, sleep disturbances, upset stomach, difficulty concentrating, short temper, job dissatisfaction, and low morale

- Long-Term risks for sustained job stress:

    Cardiovascular diseases, diabetes, weakened immune function, musculoskeletal disorders, and depression.

Social Ecological Model for Health Promotion

Individual
- Eat well
- Exercise
- Don't smoke
- Manage Stress

Interpersonal
- Social support
- Fitness partners

Institutional
- Healthy foods in café
- Fitness facility

Community
- Rail trails
- Sidewalks in good repair
- Quality recreation areas

Policy
- Trans fat bans
- Smoke free workplaces

How do we go about changing it?
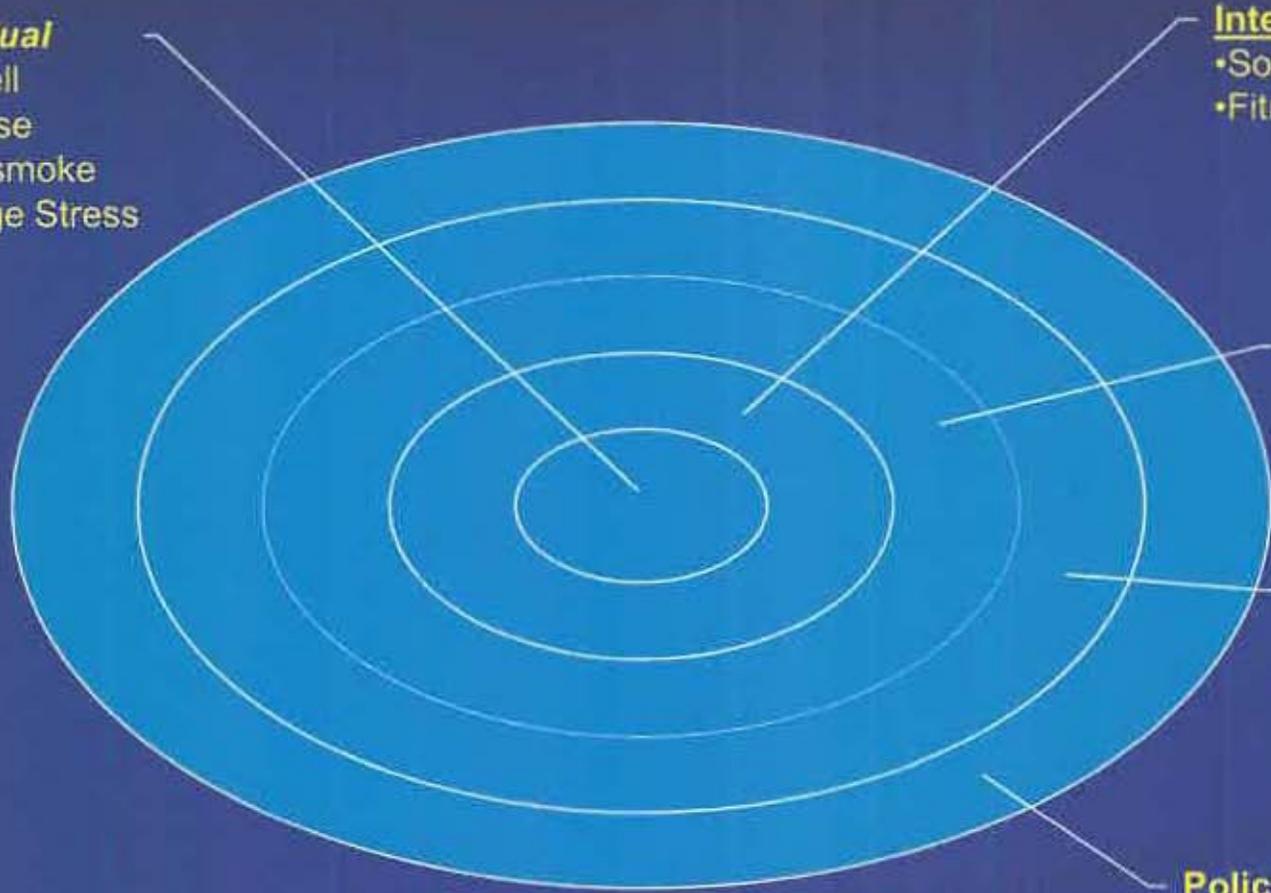
Legislation, regulation, workers compensation ➡️ **Economic, political context**

⬇️

Employer initiated policies, programs, downsizing; Collective bargaining ➡️ **Organizational context**
Downsizing
Contingent work
New systems of work organization

⬇️

Employer initiated job redesign, supervisor training, participatory ergonomics, Joint L-M S&H committees ➡️ **Job characteristics**
Low job control
High job demands
Social isolation

⬇️

Health promotion, EAPs Stress management ➡️ **Stress response**
Physiological effects (e.g., BP)
Psychological effects (e.g., burnout)
Health behaviors

⬇️

Tx, Rehabilitation ➡️ **Illness**

10

Organizational vs. Individual

- Organizational changes -- TOP priority!
- Also offer programs for individuals-- we cannot eliminate stressors *completely* for all workers.

- GOLD STANDARD

  Combining organizational AND individual stress management approaches for best results.

Examples of Primary Prevention

- Organizational Policies and Systems
  - Discrimination and grievance policies
  - Career ladders and job design initiatives
  - Work-life balance policies
  - Management/supervisor training standards
- Work Processes and Labor policies
  - **Participatory** quality programs
  - Ergonomics and work/environmental design standards
  - No mandatory overtime policy

Examples--Secondary Prevention

- **Organizational Strategies**
  - Team Building
  - Worker education and training
  - Supervisor training programs

- **Individual Strategies**
  - Healthy lifestyles
  - Meditation
  - Social/Emotional Outlets
  - Assertiveness Training

Examples of Tertiary Prevention

- Organizational Strategies
  - Employee Assistance Programs
  - Modified duty, job reassignment
- Individual Strategies
  - Psychological Counseling/therapy
  - Medical care and Treatment
  - Leave the job
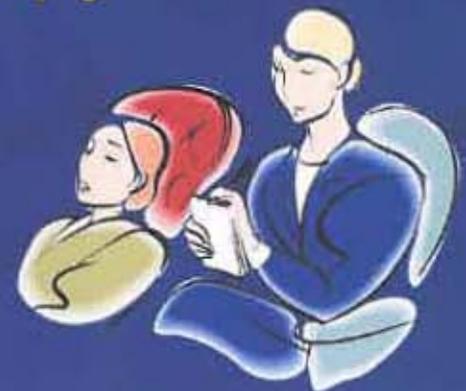
What you can do as a health and wellness leader?

- Continue offering a range of programs to help individuals cope with stressors, engage in healthy behavior, get preventive screening.

- Begin to address working conditions in your wellness programs.
  - Forge new partnerships—HR, union, OHS—to begin addressing the work environment
  - Measure workplace stressors
  - Advocate for healthy work policies and supervisor training

Barriers

- Q: What barriers do you anticipate?

- Q: How can you overcome them?
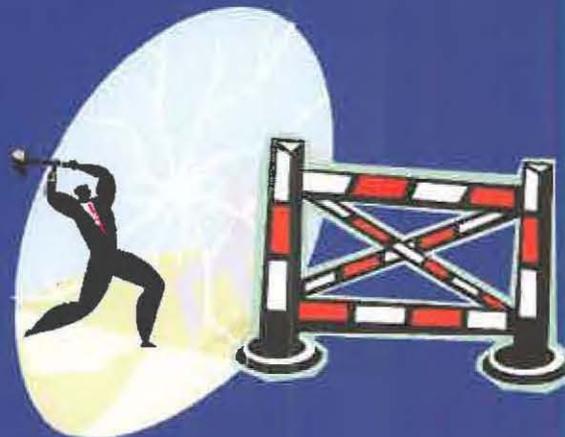
Resources

- American Psychological Association
  www.apahelpcenter.org
- NIOSH Stress at Work
  www.cdc.gov/niosh/pdfs/stress
- UMass Lowell Center for Promotion of
  Health in the New England Workplace
  www.uml.edu/centers/cph-new/job-stress

Acknowledgements

Paul Landsbergis, SUNY Downstate

CPH-NEW Website
www.uml.edu/centers/cph-new

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www.uml.edu/centers/cph-new/job-stress
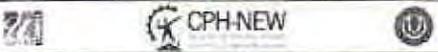
Healthy workplaces:
Are employers offering coordinated health promotion
and occupational health programs in Massachusetts?

Patricia Tremblay MS, Suzanne Nobrega MS, Laura Punnett ScD

University of Massachusetts Lowell, Depart. Of Work Environment

Letitia Davis ScD and Lisa Erck MS

Massachusetts Department of Public Health

Presenter Disclosures

Suzanne M. Nobrega

The following personal financial relationships with
commercial interests relevant to this presentation
existed during the past 12 months:

"No relationships to disclose"

CDC "Health Impact Pyramid"
Shifting our Emphasis

Rationale for "Integrated" worksite health improvement programs

Working conditions link directly to health behavior and health outcomes

---

MA Worksite Health Improvement Survey

- Dunn & Bradstreet database: 30,000 worksites in MA with 11+ employees
- Stratified sample, analyses weighted
  - 6 regions in MA, 5 workforce size categories
- 3,000 surveys distributed
- 890 responses (30%)

MA Worksite Health Improvement Survey

- Organizational Characteristics (11 items)
- **Worksite Health Promotion** (32 items)
- **Occupational Safety and Health** (17 items)
- Emergency Response (11 items)

Study Questions

1. Are WHP and OSH scores correlated?

2. To what extent do employers report coordination between WHP and OSH?

"How often does OSH coordinate their efforts with health or wellness activities?"

Organizational and Workforce Characteristics

	Raw n (of 800)	Weighted %
Size (# employees at the site)		
11-49	498	83%
50-149	150	10%
150 and over	241	7%
Unionized (some or all)	122	10%
Shift work (2 or 3 shifts)	303	23%
Industry (NAICS code range):		
Construction (23)	73	11%
Manufacturing (31)	173	16%
Professional Services (54)	94	12%
Health Care (62)	121	10%
"Other" various	429	51%

Scoring methodology
Scores = % possible points

- **WHP-Activities**: Sum of "yes" responses (17 possible points) (E.g. HRAs, yoga)

- **WHP-Policies**: Sum of "yes" responses (15 possible points) (E.g. committee, budget)

- **WHP Overall** = WHP-A + WHP-P (32 pts)

- **OSH**: Sum of "yes" responses about policies and resources that address safety and health hazards (13 possible points)

Score Results

Mean activities score = 19.9%
Mean policies/admin score = 19.4%
Mean OSH score = 47.5

Comparison of Scores by Industry – Weighted Data
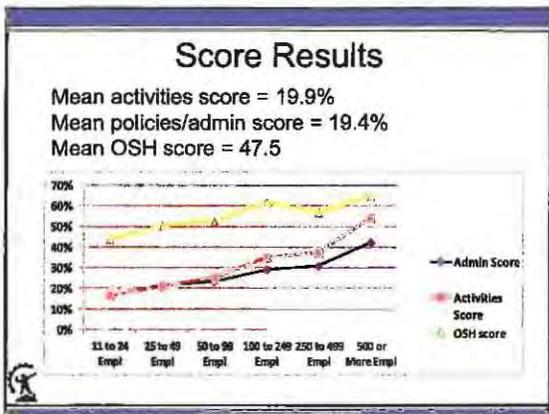
WSH and OSH Correlation

	WHP Policy Score	WHP Activities Score	Overall WHP Score
OHS Score	0.358	0.294	0.366

Unionization makes a difference

Any union?	Wellness (combined)	Wellness Activities	Wellness Admin	OSH Score
No*	-2.7 (0.1, -5.6)	-0 (-0.3, -7.3)	-1.3 (1.6, -4.2)	-9.6 (-3.1, -18.1)
DNK*	-7.8 (-1.1, -14.5)	-7.9 (1.2, -17.1)	-7.6 (-1.4, -13.9)	-21.4 (-5.7, -37.2)

* Compared to 'Yes' for any workers with union representation

4

"How often does OSH coordinate their efforts with health or wellness activities?"

Survey Answer	Number of Responses	% of Responses
always / often	247	28%
sometimes / never	230	26%
DNK / NA / blank	413	46%

Higher coordination rates in larger organizations, manufacturing, healthcare, and construction

Conclusions and Opportunities

- This study attempted to measure prevalence of WHP/OSH integration in practice.
- WHP and OSH program practices of MA employers in this sample are moderately correlated.
- Employers that reported more programming overall were more likely to report coordinating WHP and OSH efforts.
- MA employers in this sample have lots of room to improve/enlarge WHP practice!

Study strengths/limitations

- Strengths—systematic sampling of public and private sector
- Response rate relatively low (30%) and uneven across industry sectors
- Responses not validated (self-report)
- Generalizability depends on state-specific industry mix and H&S regulations
- Impact of health care reform uncertain

Acknowledgements

- Patricia Tremblay, UML—data analysis
- Kathleen Grattan, Katrina D'Amore--
  - Access to survey data, consultation on study design, analysis and interpretation

Report available at
http://www.mass.gov/Eeohhs2/docs/dph/m
ass_in_motion/worksite_survey_report.pdf

CPH-NEW main website
www.uml.edu/centers/CPH-NEW

The Center for the Promotion of Health in the New England Workplace is supported by Grant Number 1 U19 OH008857 from the National Institute for Occupational Safety and Health. Results are solely the responsibility of the authors and do not represent the official views of NIOSH.

PROJECT D: "An R2P Toolkit for establishing sustainable workplace health protection/promotion programs"

Grant Number 1U19 OH008857

Grant period: July 1, 2009 to June 30, 2011

Report Date: November 20, 2011

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List of Terms and Abbreviations

CPH-NEW: Center for Promotion of Health in the New England Workplace
HITEC: Health Improvement through Training and Employee Control
HP: Health Promotion
NIOSH: National Institute for Occupational Safety and Health
NORA: National Occupational Research Agenda
PE: Participatory Ergonomics
PERS: Participatory Ergonomics Readiness Scale
PExHP: Participatory Ergonomics with Health Promotion Program
PI: Principal Investigator
Pro-Care: Promoting Physical and Mental Health of Caregivers through Transdisciplinary Intervention
R2P: Research-to-Practice
SBS: Step-by-Step

ABSTRACT

The overall goal of Project D was to create a set of easy-to-use assessment instruments and protocols in a toolkit format geared to participatory development of in-house programs for the continuous improvement of employee health and safety. This Research-to-Practice (R2P) Toolkit provides everything necessary for health and safety professionals with the equivalent of masters-level training to implement a new type of program that integrates health promotion with workplace health protection. The design of the toolkit is largely based on lessons learned from CPH-NEW field studies, where the success of this integrated approach has been shown to depend on line-level employees assuming an active role in the planning and design of workplace interventions. A distinctive feature of programs developed via this toolkit approach is that a design team made up of line-level employees engages in participatory ergonomics (PE) as a way to combine workplace ergonomic changes with workplace health promotion (HP) approaches. The resulting "PExHP" program is not unlike continuous quality improvement programs prevalent in modern industry, making it an attractive option for forward-looking organizations ready to enhance conventional HP programs that lack participatory design and workplace change components. With a PExHP program it is possible to take an integrated approach to a wide range of work environment, work organization, safety, and employee health issues/concerns. The R2P Toolkit provides specific guidance on how to establish a PExHP program with a steering committee and a group of line-level employees functioning as a "design team." A set of sequential protocols and instruments are directed towards initial and follow-up assessment of 1) ergonomic issues, 2) employee health status and their salient health and safety concerns, and 3) the organization's general readiness for engaging in a PExHP program. Training protocols, support materials and program planning tools are also provided for gaining and maintaining the requisite support from upper management, and continuously refining program elements. Further development of the R2P Toolkit is ongoing as it is being field-tested at four worksites, including creation of a tool to support the 'hand-off' of the PExHP program to internal program facilitators and its integration with existing organizational structures to promote long-term program sustainability. Comprehensive evaluation of the R2P Toolkit will occur in Year 6 following completion of several intervention planning and implementation cycles at each worksite.

Significant Findings

AIM 1: Develop an abbreviated, comprehensive, integrated R2P Toolkit of assessment and intervention instruments and protocols for testing in field sites, based on evidence from current CPH-NEW projects.

The design of the toolkit is largely based on lessons learned from CPH-NEW field studies, where the success of this integrated approach has been shown to depend on line-level employees playing an active role in the planning and design of workplace interventions. A distinctive feature of programs developed via this toolkit approach is that a design team made up of line-level employees engages in participatory ergonomics (PE) as a way to combine workplace ergonomic changes with workplace health promotion (HP) approaches. A "PExHP" program (Henning et al., 2009) is not unlike continuous quality improvement programs prevalent in modern industry, making it an attractive option for forward-looking organizations ready to enhance conventional HP programs that lack participatory design and workplace change components. The R2P Toolkit provides specific guidance on how to establish a PExHP program with a steering committee and a group of line-level employees functioning as a "design team." A set of sequential step-by-step guides, protocols and instruments are directed towards initial and follow-up assessment of 1) ergonomic issues, 2) employee health status and their salient health and safety concerns, and 3) the organization's general readiness for engaging in a PExHP program. Training protocols, support materials and program planning tools for gaining and maintaining the requisite support from upper management and continuously refining program elements are also provided.

AIM 2: Field test the Toolkit and methods in a small sample of selected worksites.

Following a development period and site recruitment efforts in Year 4 (Year 1 of Project D), field tests began in Year 5 at a small realty and property management firm, a not-for-profit human services organization, a state government agency, and a state prison. Lessons learned

1. The PExHP program is well received by host organizations. Three of the four test sites had conventional workplace HP programs already in place but were perceived as not fully effective.

2. PExHP program design can be adapted to suit a wide range of organizational needs/constraints.

3. The R2P Toolkit can be readily used by health/safety professionals with masters-level training to initiate and guide the PExHP program.

4. Line-level employees are able to function effectively as a design team; they are able to identify and prioritize health/safety issues/concerns, and generate and justify feasible intervention proposals for improving employee health and safety along with metrics for their evaluation.

5. Researcher concerns about PExHP program start-up being lengthy were not generally shared by host organizations in part because establishing a PExHP program involves organizational learning about participatory design that is perceived by managers as valuable and worth supporting.

AIM 3: Utilize evidence-based evaluation tools to assess the acceptability, usability, and effectiveness of the field interventions.

Qualitative evaluation of the R2P Toolkit has been conducted during all aspects of field testing. PExHP program facilitators provided detailed feedback reports indicating strengths and

weaknesses of using each prototype tool so that iterative design efforts would address tool shortcomings. Overall program effectiveness was also monitored, and the success of intervention planning processes closely tracked.

Lessons learned

1. Steering committee review and support of intervention proposals is aided when a design team develops a set of intervention alternatives for addressing a health/safety issue/concern.

2. Steering committees, not only design teams, need to be able to initiate intervention planning as part of a PExHP, and this can lead to collaborative efforts with the employee design team.

3. A PExHP program facilitator is not required to be highly trained in principles of ergonomics nor health promotion but does need specific guidance on when and how to seek outside expertise.

4. Outside experts, when their advice is solicited during the intervention planning and design process, need coaching on how to support participatory design efforts.

5. Scientific evaluation of research-to-practice programs like the R2P Toolkit introduces "catch-22" situations in which assessment techniques and protocols can sometimes conflict with program design needs.

Translation

Employers and others can achieve more effective workplace employee health programs by incorporating participatory design and an explicit orientation toward assessing opportunities for and obstacles to workplace change. The R2P Toolkit project has developed a series of tools that can be used to achieve these goals:

1. Worksite Readiness Checklist
2. Key Personnel Interview Guide
3. Steering Committee Creation & Orientation Guide
4. All-Employee Survey & Feedback Report Guide (submitted with this Final Report)
5. Employee Focus Group Guide
6. Employee Design Team Creation & Orientation Guide
7. Ergonomics Training and Walk-through Evaluation
8. Health Promotion Training

Outcomes

Potential outcomes: There is a tremendous need for effective employee health programs. The overall goal of Project D was to create a set of easy-to-use assessment instruments and protocols in a toolkit format geared to participatory development of in-house programs for the continuous improvement of employee health and safety. This toolkit would provide everything necessary for health and safety professionals with the equivalent of masters-level training to implement a new type of program that integrates health promotion with workplace health protection. The use of the R2P Toolkit, and the associated decision-making support system it offers to organizations during intervention planning efforts, could reduce the risk of adverse health conditions and safety hazards for workers and also provide a means to integrated health promotion initiatives. This integrated approach to a wide range of work environment, work organization, safety, and employee health concerns has been well received at each of the four test sites, with the participatory design features of the PExHP programs able to engage line-

level employees in both the intervention planning and intervention evaluation efforts. Evaluation of the health and safety impacts, and overall effectiveness of the PExHP programs, including re-administration of the All-Employee Survey, are all planned for the carry-forward Year 6.

Scientific Report

Project Background

This project was an RO1 competitive revision to 1 U19 OH008857 (PI Punnett): Center for the Promotion of Health in the New England Workplace (CPH-NEW). The organizing principle of CPH-NEW is to integrate occupational safety and health (OSH) and workplace health promotion (WHP). Prior evidence and ongoing CPH-NEW research provide evidence for the effectiveness of participatory and self-correcting approaches to both types of workplace health activities.

The wide array of research instruments used to measure organizational readiness for change and to evaluate intervention success, combined with the development of participatory structures and processes, is resource- and time-intensive. While appropriate for a scientific study of program effectiveness, the research protocol is inappropriate to recommend for widespread use by practitioners such as public health officials, insurance personnel, consultants, and in-house company champions - a typical obstacle to Research-to-Practice (R2P) efforts (Glasgow and Emmons 2007).

Commercial wellness programs tend to overlook occupational health and safety concerns and to concentrate on a limited number of individualized behaviors such as smoking, alcohol use, and physical activity. Such programs usually fail to address potential obstacles to program participation in the work environment. They also typically pay too little attention to the effect of the work environment on health behaviors and to the balance between work life and non-work life. Perhaps not coincidentally, employee participation in many worksite health promotion programs is often low, especially in the hourly workforce. Melding occupational health and safety with workplace health promotion through an integrated participatory program provides an opportunity to address both domains at a higher organizational level, by exploring changes in work organization and organizational policies that can improve worker health.

Project D built upon ongoing CPH-NEW work and rested upon two key premises: 1) a Toolkit for assessment and program design that is intended to be universally applicable will not in fact be relevant to the full range of organizations or the scope of multi-level risk factors; and 2) program design should empower both the workforce and its management to identify their highest priority health issues and to quantify the readiness of the overall organization for change. These premises were to be satisfied by implementation of the CPH-NEW participatory approach which seeks to address barriers stemming from organizational culture and structure and to install a continuous improvement process.

The present 2-year project utilized CPH-NEW research findings and methods and translated them into a much-reduced set of easily applied measurement tools. In parallel, the protocols of program development were reduced to streamlined basic steps. Where necessary, materials from other sources were added. An initial toolkit development period of 8 months was followed by testing in 3 field sites recruited from Massachusetts Department of Public Health "Worksite Wellness" program participants, and one Connecticut Correction facility (all recruited through ongoing CPH-NEW activities). We assessed acceptability, usability, and short-term effectiveness of an integrated Toolkit (instruments and procedures); initial results and review by practitioners guided further revisions to enhance its suitability for field testing and future dissemination to practitioners.

Participatory approaches in which workers and managers jointly address workplace health are recognized as a fundamental component of a healthy workplace program (Baker 1994; Bull 2003; Itani 2006). The most developed strategies that involve labor and management in active implementation are participatory ergonomics (PE) programs. These have been used successfully to address biomechanical exposures such as repetitive and forceful motions;

psychosocial issues such as the need for autonomy and social support; and organizational aspects of complex sociotechnical systems (Imada 2002; Haro 2008).

Haines et al. (2002) developed a "participatory ergonomics framework" (PEF) for evaluating PE programs. Validation involved the scoring of PE programs in nine dimensions, such as level and duration of involvement, the worker-management mix, the quality of solution generation, and the use of an external specialist or ergonomist. There was concurrence between developers and the managers, but there was no venue for employee evaluation. Several of the same authors analyzed 12 ergonomic interventions to identify aspects of successful PE programs (Koningsveld et al. 2005). Key needs identified for an effective working group were a broad scope of interventions and a mechanism for evaluating effectiveness. Vink et al. (2006) added objective baseline organizational assessment as a necessary first step.

Van Eerd (2008) reviewed 52 studies of participatory ergonomics interventions to identify key facilitators and barriers. The barriers and facilitators that were identified were: 1) Management support, 2) Available resources, 3) Ergonomic training, 4) The creation of design teams, 5) Communication, and 6) Organizational training. This report strengthens the argument for the current research and for the need to develop measures of organizational readiness for PE interventions.

The overall experience with PE programs underlines the importance of management-workforce participation that is capable of producing results, as well as an evaluation component for determining effectiveness, and adequate access to external expertise and resources. Additional emphasis is placed on mechanisms for sustainability, particularly through systems of continuous improvement. On the other hand, the PE approach with its primary focus on workstations and musculoskeletal heath has not been widely translated into WHP applications. Recognizing the complementary nature of PE and WHP, Haslam (2002) noted that workplace culture could be a major barrier to WHP and that the types of organizational assessment tools employed in WHP would be helpful if adapted to PE programs in their early stages. Similarly, Koningsveld and co-workers (2005) suggested that a brief inventory be administered prior to any intervention so that possible bottlenecks could be identified; however, they provided no framework for such an inventory.

It is notable that the most successful participatory programs lack instruments for assessing management attitudes and workplace culture, whereas WHP programs, on the other hand, tend to limit employee participation to a planning phase rather than promoting joint engagement and control.

Successful examples of integration of participatory ergonomics with participatory WHP are limited. The "health circles" approach, popularized in Europe, uses an outside facilitator or consultant to engage employers and employees to select WHP and workplace exposure reduction programs that are most congruent with their needs, as assessed by employee survey (Aust and Ducki, 2004; Bauer and Jenny, 2007).

Haims and Carayon (1998) described continuous improvement as itself a measure of effectiveness and program sustainability. They stressed the importance of resources, training, regular meetings, and effective activity. In an influential paper, Glasgow (2007) identified general deficiencies in research which limit R2P, with direct application to integrating PE and WHP. They noted the importance of assessment instruments and program materials that place minimal demand on staff, are easy to learn, and continuously modifiable. Their criteria have been incorporated into the CPH-NEW program evaluation process.

In summary, dominant approaches to WHP in the U.S. put more emphasis on buy-in from upper-level management than workers. Participatory models have been developed and

evaluated for both WHP and ergonomics programs; emerging efforts to integrate these two domains have perhaps even greater imperatives to proceed along these lines for enhanced participation, efficacy, and sustainability. There is value to assessing organizational culture and using organizationally specific tools for program development and efficacy evaluation.

The aims of Project D were therefore as follows:

AIM 1: Develop an abbreviated, comprehensive, integrated R2P Toolkit of assessment and intervention instruments and protocols for testing in field sites, based on evidence from current CPH-NEW projects.

AIM 2: Field test the Toolkit and methods in a small sample of selected worksites.

AIM 3: Utilize evidence-based evaluation tools to assess the acceptability, usability, and effectiveness of the field interventions.

AIM 4: Use field research results to create a Toolkit and a set of evaluation instruments for adoption by professional consultants and practitioners, with the goal of disseminating the approach to a wider range of companies in different sectors and of different sizes.

Methodology

Components of the field-tested R2P Toolkit are described below (**Aim 1**). Initial review of prototype start-up materials was requested from 3 outside experts before beginning the field testing. Reviewers including two nationally prominent health promotion university researchers and two industry based researchers experienced in occupational safety and health research and program development. Due to delays in response times, the project team proceeded into the field testing phase without the expert review in order to stay on target with the project timeline.

The R2P Toolkit was tested at four worksites (**Aim 2**) following site recruitment efforts in Year 4 (Year 1 of Project D). Field testing was conducted at: a small realty and property management firm, a not-for-profit human services organization, a state government agency, and a state prison. Site facilitators were one advanced graduate student and two health professionals holding masters degrees. One of these health professionals was internal to Project D, and the other was hired as an outside consultant. An evaluation form was used by site facilitators to collect standardized qualitative data on the acceptability and ease of use of the Toolkit materials. In general, program start-up tools in the R2P Toolkit were found to be both usable and effective. Whenever this was not the case, feedback from a facilitator regarding which aspects of a tool were problematic was used to revise this tool before it was used by a facilitator at another worksite. The results of these evaluations are presented below within the discussion of each Toolkit component.

The evaluation of the overall acceptability, usability, and effectiveness of the R2P Toolkit (**Aim 3**) at each site cannot occur until after several workplace intervention planning and implementation cycles are completed. Therefore, this evaluation is planned in Year 6 (with carry-forward funds) and will involve re-administration of the All-Employee Survey, interviews with key personnel, walk-through evaluations by expert evaluators and focus groups with design team members. It can be noted that the need to conduct overall evaluations in Year 6 was expected because NIOSH funding for Project D was delayed at start-up.

Development and testing of a web-based version of the R2P Toolkit (**Aim 4**) will also be carried out during this carry-forward year.

Results and Discussion

This section is organized by tool, rather than by Aim. For each tool we first describe the purpose and the original content (Aim 1). We then summarize some of the key lessons learned through field testing (Aim 2), along with any completed or planned further revisions (Aim 3).

Tools for Support of PExHP Program Start-up

The first task in the development of the R2P Toolkit was to create a condensed suite of assessment instruments and program implementation protocols based on what CPH-NEW researchers found to be most effective in the larger research-intensive field studies. Two principles guided development efforts: 1) the R2P Toolkit would need to be adaptable, with a strong emphasis on identifying cultural and structural differences among sites, including the degree of readiness for an integrated worksite prevention/health promotion program and participatory approach, and directing the program towards potential barriers and facilitators associated with these differences, and 2) the development of integrated instruments and intervention protocols would focus on the creation of on-going, self-correcting, and sustainable regarding employee participation in program initiation, evaluation, and maintenance.

The start-up assessment tools described below were designed to strike a balance between identifying salient health/safety issues/concerns and gathering sufficient baseline data for later determination of program viability, as well as its safety and health impact on employees. Salient health and safety needs were also used to target initial training of ergonomic and health promotion principles and to focus the initial intervention planning and design efforts. These assessment instruments were designed for ease of use and high surface validity, and to produce data that would be easy to interpret by members of the host organization. To meet the abovementioned needs, the following tools are designed to be used in the order they are listed below. Each tool has a companion step-by-step (SBS) guide to assist a facilitator with its use.

Key Personnel Interview and SBS Guide (Appendices D-1 and D-2). This tool allows initial determination of the workplace climate and culture regarding employee health, the present and past policies regarding safety and health initiatives, and also provides a means for the facilitator to gather information about prospective members of the program steering committee. The SBS guide explains how to identify which key personnel to invite for an interview, and ways to consult with the organization's designated health champion or program liaison regarding these choices. In order to tailor the program's start-up process, an organization's readiness to engage in participatory design efforts and shared decision-making with employees is assessed along with its ergonomic and HP expertise through use of the Participatory Ergonomics Readiness Scale (PERS), a component of the Key Personnel Interview. This scale was validated during a review of potential field sites in Project B (HITEC).

Lessons learned. This interview tool worked well but required more time than anticipated. Therefore, some changes were made to shorten its length and to avoid duplication across interviews. For example, questions about past safety and health initiatives were only administered in one interview. One of the domains assessed in the PERS scale, ease of assembling front line employees and management to work together in teams, routinely revealed that convening employees every two weeks would be difficult or moderately difficult. This had direct relevance to design of the PExHP program, as meetings would need to be held less frequently than desired, and therefore progression through the program start-up process or through complete intervention design and implementation cycles would therefore be slower. An extended start-up timeline was in fact implemented in all four field test sites. Similar findings

regarding this aspect of participatory readiness may be encountered in other sites, particularly given the lean workforce practices that have intensified during the present economic recession.

Worksite Readiness Checklist and SBS Guide (Appendix D-3). This tool provides a means for a facilitator to easily assess a an organization's readiness to establish a PExHP program based on current safety and health promotion programs, extent that the work environment supports healthy behavior.

Lessons Learned. During program start-up, this tool can also be used by members of the program steering committee or design team as part of orientation and training. Evaluation and validation of the checklist items have been published elsewhere (Faghri et al., 2010). While part of the R2P Toolkit, this instrument was not field-tested in this study because the study sites had data in hand from similar assessments conducted just prior to the initiation of Project D.

Steering Committee Development and SBS Guide (Appendix D-4). This tool aids selection, recruitment and training of members for the program steering committee. A PExHP program requires the creation of steering committee with appropriate representation from multiple levels of an organization so that it is empowered to oversee and provide a wide range of needed resources for PExHP interventions. This tool also helps a facilitator cover key participatory design principles during initial training/orientation meetings with the steering committee. For example, these include defining the respective roles of this steering committee and the design team as well as how to communicate program developments throughout the organization in a way that will promote the program and organizational learning. These tools were designed based on the collective experience of CPH-NEW researchers in Projects A and B regarding effective strategies for steering committee formation. This experience included lessons learned regarding the need to invest program steering committees with sufficient leadership strength and organizational representation. This is crucial in arranging for members of design teams to meet on a regular basis and marshalling needed resources for workplace interventions. Evaluation of the SBS guide and associated materials was done qualitatively through two main mechanisms: 1) the site facilitators identified gaps and problems in real time as they used the materials to plan Steering Committee meetings, and 2) the site facilitators documented reflections from Steering Committee meetings concerning acceptance of the participatory process and training activities. These observations were written in logs, and discussed in project management meetings with project investigators. When the Process Tracking Database Tool became available (see below) these observations were also entered into a database.

Lessons learned. The present structure of PExHP programs requires that a program steering committee be formed that is distinct from existing organizational structures. Since key personnel are recruited to serve on the PExHP steering committee, this necessarily limits how often the steering committee can meet, often prolonging the PExHP program start-up process.

While a stand-alone steering committee seems best during the program start-up period because of the unique nature of PExHP programs and their associated resource needs, we have observed at several test sites that the host organizations have later reassigned program oversight responsibilities to a standing committee. While the long-term consequences of this reassignment cannot be known at this time, it is possible that the integration of PExHP program oversight into existing organizational structures might improve PExHP program sustainability. Therefore in Years 6-10, we plan on incorporating protocols to better support these types of oversight transitions, and testing whether having a distinct PExHP program steering committee is only necessary during the program start-up period. This would also be consistent with advice we received from an external consultant on Project D, Dr. Georg Bauer, head of the Division of

Public and Organizational Health of the University of Zurich and associated with the Swiss Federal Institute of Technology.

Although participatory design is central to the PExHP program, we found that a consistent level of participation by members of the steering committee and/or design team can be difficult to maintain at all times during program start-up. To help address this, we found that facilitator presentations of site assessment findings to the steering committee and design team must always include adequate group discussion periods so that members do not feel that the facilitator is imposing a fixed set of priorities.

Limiting all initial intervention planning and design efforts to the employee design teams (our original procedure) was found to undermine the important proactive role the program steering committee can play in a PExHP program. It also seemed likely that limiting steering committees to a mostly reactive role could reduce long-term program sustainability. Consequently, steering committee members now receive training on intervention planning similar to the training that design team members receive, and they are encouraged to initiate intervention planning independently from the design team. One benefit of this approach is that a collaborative working relationship is more likely to develop between the steering committee and design team when they are both actively involved in planning interventions.

Although our PExHP programs were based in separate design teams and steering committees, two of our test sites adopted alternate structures. At one site, where the existing wellness team had representation from across the organization, this wellness team assumed the role of the design team. At another site, for reporting purposes, one supervisor attended meetings of both the design team and steering committee. In each case it was possible develop new protocols to support these alternative structures but it is yet to be determined if these alternative program structures are fully effective or have any serious drawbacks. Our intention to fit program elements to the host organization's culture and existing structures argues for this approach.

Employee Focus Group Script and SBS Guide (Appendices D-5 and D-6). This tool enables the creation of a rank-ordered list of the most pressing health/safety issues/concerns from the perspective of a small group of employees, and the creation of a list of resources for and obstacles to workplace changes that could promote employee health and safety. These group-identified issues/concerns are presented to the steering committee and are used to customize the All-Employee Survey (below) as needed. These same results can be used to inform the design team as part of the orientation to health and safety issues and the intervention planning start-up process.

Lessons learned. The focus group questions were extremely effective for identifying salient workplace health and safety concerns at a level of detail that was beyond what the All-Employee Survey results were able to describe. Focus group findings in test sites were particularly useful for adding depth of understanding to safety and health concerns and served as a useful comparison to the open-ended responses to the All-Employee Survey. Comparison of focus group results with manager interview responses highlights common and divergent perceptions between management and front line workers. Anticipating that the start-up period for new PExHP programs may sometimes need to be shortened, and to avoid redundancy during the design team development process, we have incorporated themes from the employee focus group into the training program for the design team. Therefore, conducting separate employee focus groups apart from the design teams is now optional, reducing the PExHP program start-up period by about one month.

All-Employee Survey and SBS Guide with Reporting Templates (also called the All-Employee Health and Work Environment Survey) (Appendices D-7 and D-8). In order to create this tool, items contained in the CPH-NEW long-form surveys used in the Pro-Care and HITEC studies during Years 1-5 were carefully screened to achieve an abbreviated instrument. Items were chosen on two criteria: 1) items or short scales identified through factor and reliability analyses of original CPH-NEW scales and 2) items or scales most closely correlated with physical exams administered in Projects A and B. Before administration, the survey is thoroughly discussed with the steering committee, using the "Survey Item Justification Document" to explain the potential uses of each survey domain and invite additions or deletions based on local needs. Once finalized, the survey is administered to each employee to identify health/safety issues/concerns, some of which can be compared to normative data. In addition, a list of work characteristics that are perceived to either reduce or increase employee health and safety are collected in free-text questions. These employee-identified issues/concerns are also presented in aggregate to both the steering committee and design team as part of the orientation and start-up intervention planning process. Re-administration of this survey after about one year is useful in program evaluation efforts. A copy of this tool and the Survey Item Justification Document are included with this submission.

Lessons learned. Striking a balance between practicality and scientific rigor in testing translational efforts is particularly challenging. For example, individual employee codes were retained on surveys in order to allow individual-level pre-post comparisons, but following protocols for the protection of participant confidentiality was burdensome, and also required that the host organization's access to these data be restricted. Both aspects distorted testing of simpler survey methods that are preferred in a toolkit approach. A planned in-depth analysis of pre and post All-Employee Survey results is expected to determine if continued use of participant codes (and individual-level analysis) is necessary to detect the expected benefits of a PExHP program. All PExHP surveys were paper-based to maintain employee confidentiality and data security. However, employees at two test sites indicated a strong preference for web-based surveys. These are being developed as part of Project C. Without this functionality, data collection, entry, and analysis are extremely time-consuming and require the use of university resources.

Evaluation of the acceptability and utility of the survey itself was done qualitatively by site facilitators who kept logs on questions, concerns, and modifications requested by steering committee members during planning meetings. Study sites requested either no changes, or minimal changes (minor wording changes or modification of demographics questions) before the survey instrument was administered to employees. None of the sites opted to add optional modules on specific topics (such as ergonomic exposures) that were offered. The "survey item justification document" was very well received as it clearly described how the results for each question could be interpreted and potentially applied in workplace interventions. In general, this process of steering committee review was successful in building ownership of the All-Employee Survey by the steering committee, consistent with the participatory design theme of the PExHP program.

When survey results were presented to the organization, site facilitators noted several procedural and political challenges that are presently being addressed in refinements to both the survey instrument and its SBS guide:

- Review and discussion of survey results requires at least 90 minutes; organizing the presentation of findings into 2 meetings is beneficial for allowing enough time for discussion and processing of the information.

- Results reported as frequencies are more easily understood than scores, particularly if no reference data are provided for comparison.

- References to population norms or data from other sites are important. Sites often asked whether the survey results were "good or bad," and how they compared to other employers within their industry.

- Results of certain psychosocial domains — particularly perceptions of management support, procedural justice, and incivility — can be difficult to accept and discuss in organizations already experiencing management/worker tension. Careful framing and management pre-approval of results to be used for presentation to a broader employee base was needed at one test site as a pre-requisite to proceeding with the PExHP program.

- Communication of the full scope of results to the broader workforce can be challenging in organizations that do not have well-developed employee communications systems in place.

Design Team Development Tool and SBS Guide (Appendix D-9). This tool explains how to recruit the right mix of interested and capable employees to serve on the employee design team. It includes the steps necessary to obtain the necessary release time for regular meetings of the design team, and to inform supervisors of the importance of this release. Companion tools include training modules on health promotion fundamentals, and ergonomics fundamentals along with site evaluation checklists. Evaluation by site facilitators identified several gaps in early start up materials that were addressed through "just in time" creation of meeting facilitation planning tools and structured group activities. Cross-site meetings of project facilitators were held to report progress in each of the study sites, identify and anticipate challenge areas, and refine the materials supporting the design team development process and progression through the intervention planning and design process.

   Lessons Learned. Guidance and tools to support the participatory design process are essential components of the R2P Toolkit. Group activities, shared responsibility, communication, and skill building are aspects that differentiate an employee-based participatory program from a top-down, management led program. Facilitators (who themselves may lack experience with participatory methods) were found to need ideas and tools for guiding group process activities, specific guidance and training on participatory meeting facilitation skills, and a model for facilitating ongoing worker-management collaboration. In Projects A and B, design teams used a 7-step planning process for developing intervention proposals one at a time. However, intervention proposals were sometimes rejected by the steering committee, and this was found to have a devastating effect on some members. To help prevent the negative impact these rejections can have on design efforts and design team member morale and motivation, a new 9-step intervention planning process was developed, the Business Decision Scorecard, based on a systems analysis approach previously published by co-PI Robertson (Robertson et al., 2004). This enhanced step-wise approach results in a set of intervention alternatives being created to address a single health/safety issue/concern. Having these alternatives provides flexibility to the steering committee review process, and has been found to increase the likelihood that at least one of these intervention approaches, or some combination or variation, will be supported by the steering committee. The Scorecard process also builds design team abilities to determine competing cost/benefit ratios and anticipate organization-level needs and calculations, thereby putting design team and steering committee members on a more equal footing in the intervention planning and design process. The Business Decision Scorecard tool is being developed further as part of Project C in Years 6-10.

At our Legacy sites in Projects A and B we have observed a need to rotate some members on and off the design teams. Related to this, we are considering recruiting new design team members who are particularly interested in working on a specific health/safety issue/concern.

Process Tracking Database and SBS Guide (Appendix D-10). A custom software tool was developed that a) supports detailed record-keeping of the intervention planning activities of both the program steering committee and the design team, and b) provides a means for logging the interactions and collaborations of these two groups. This computer-based graphical user interface system supports report generation about program design process activity linked to specific health/safety issues/concerns, and also provides the program facilitator with useful tools for planning future meetings. As a PExHP program develops, accurate record keeping can provide insights about the design process that can aid the facilitator in planning efforts. From a research standpoint, such record-keeping will be instrumental for planned process evaluation efforts.

Lessons Learned. A participatory design approach was used to develop this tool. Site facilitators and students assigned as note-takers during meetings were involved in early testing efforts, and feedback from both individuals and focus groups were used to make revisions and enhancements to this tool as needed.

The prototype tool used MicroSoft Access for the database but this proved cumbersome to use when accessed from remote sites. Therefore, development efforts in Year 5 were largely focused on developing a web-based version of this tool.

New R2P Toolkit Tool Development Efforts

Continued development of the *Business Decision Scorecard* is planned (described above in relation to the *Design Team Development Tool*). The continuing process responds to the need for a more structured approach to guide the PExHP intervention planning and design process and to increase the likelihood that steering committees will review intervention proposals favorably.

A number of new tools, directed towards specific intervention areas that emerged during Project A, B, and D research activities, are currently under development as part of Project C. Prototypes of these tools are expected to be completed and ready for field testing in Year 6 (with carry-forward funding) but their development and testing is likely to continue through Year 10. Two of these new tools, *Designing and Implementing a Weight Loss Challenge Program,* and *Workplace Incivility,* are based on lessons learned from actual design team intervention planning efforts that occurred in Project B in Years 1-5. Two other new tools, the *Work-Family Interface Tool* and the *Reducing Workplace Stress Tool,* target health/safety issues/concerns which are central of the *Total Worker Health Initiative* and were highlighted by CPH-NEW survey and focus group data.   Development of the *Business Decision Scorecard Tool* (described above in relation to the *Design Team Development Tool*) responds to the need for a more structured approach to guide the PExHP intervention planning and design process, and to increase the likelihood that steering committees will review intervention proposals favorably. Lastly a new tool, *Using Workers Compensation Data in Intervention Planning,* is under development to assist program steering committees and design teams in identifying key problem areas or in planning workplace interventions.

Conclusions

There is a tremendous need for effective employee health programs. The overall goal of Project D was to create a set of easy-to-use assessment instruments and protocols in a toolkit format geared to participatory development of in-house programs for the continuous improvement of employee health and safety. Our R2P Toolkit is designed to provide everything necessary for health and safety professionals with the equivalent of masters-level training to implement a new type of program that integrates health promotion with workplace health protection. The use of the R2P Toolkit, and the associated decision-making support system it offers to organizations during intervention planning efforts, could reduce the risk of adverse health conditions and safety hazards for workers and also provide a means to integrated health promotion initiatives. Field tests of the R2P Toolkit and this integrated approach to a wide range of work environment, work organization, safety, and employee health concerns has been well received at each of the four test sites, with the participatory design features of the PExHP programs able to engage line-level employees in both the intervention planning and intervention evaluation efforts. Lessons learned to date from field evaluations have been presented at numerous meetings of practitioners and researchers (Appendix D-11). Evaluation of the health and safety impacts, and overall effectiveness of the PExHP programs is planned for Year 6, including re-administration of the All-Employee Survey. A process of refining the R2P Toolkit will also continue in Year 6.

Acknowledgements

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Appendices for Project D

D-1   Key Personnel Interview

D-2   Key Personnel Interview Step by Step Guide

D-3   Worksite Readiness Checklist

D-4   Steering Committee Development Guide

D-5   Employee Focus Group Script

D-6   Employee Focus Group Step by Step Guide

D-7   All Employee Survey

D-8   Step by Step Guide to All Employee Survey Administration

D-9   Design Team Development Guide

D-10   Process Tracking Database Step by Step Guide

D-11   Scientific Presentations

Program Director/Principal Investigator (Last, First, Middle): Punnett, Laura/Robert Henning

Inclusion Enrollment Report

This report format should NOT be used for data collection from study participants.

Study Title: Project D: Research to Practice Toolkit Project

Total Enrollment: 302   **Protocol Number:** 09-077-PUN-XPD

Grant Number: 1U19 OH008857-

PART A. TOTAL ENROLLMENT REPORT: Number of Subjects Enrolled to Date (Cumulative) by Ethnicity and Race

Ethnic Category	Sex/Gender			
	Females	**Males**	**Unknown or Not Reported**	**Total**
Hispanic or Latino	25	12	1	38 **
Not Hispanic or Latino	155	38	4	197
Unknown (individuals not reporting ethnicity)	19	24	24	67
Ethnic Category: Total of All Subjects*	199	74	29	302 *
Racial Categories				
American Indian/Alaska Native	0	0	0	0
Asian	5	1	0	6
Native Hawaiian or Other Pacific Islander	0	0	0	0
Black or African American	13	5	1	19
White	150	45	4	199
More Than One Race	3	3	0	6
Unknown or Not Reported	21	27	24	72
Racial Categories: Total of All Subjects*	192	81	29	302 *

PART B. HISPANIC ENROLLMENT REPORT: Number of Hispanics or Latinos Enrolled to Date (Cumulative)

Racial Categories	**Females**	**Males**	**Unknown or Not Reported**	**Total**
American Indian or Alaska Native	0	0	0	0
Asian	0	0	0	0
Native Hawaiian or Other Pacific Islander	0	0	0	0
Black or African American	0	1	0	1
White	5	4	1	10
More Than One Race	0	0	0	0
Unknown or Not Reported	20	7	0	27
Racial Categories: Total of Hispanics or Latinos**	25	12	1	38 **

* These totals must agree.
** These totals must agree.

Inclusion of Gender and Minority Study Subjects

Women and members of ethnic minorities were included in proportion to their presence in the workforces at the study sites.

Inclusion of Children

No children were included in this study; specifically, workers younger than 21 years were not offered survey questionnaires or observed at work for job analyses.

Materials available for other investigators.

We are including a copy of the current version of the All-Employee Survey Tool, and its accompanying SBS (step-by-step) Guide which are designed for use by a health or safety professional as the PExHP program facilitator. (Note that all tools in the R2P Toolkit are in the process of being revised and updated as part of planned activities for Year 6.)

Appendices for Project D

D-1   Key Personnel Interview

D-2   Key Personnel Interview Step by Step Guide

D-3   Worksite Readiness Checklist

D-4   Steering Committee Development Guide

D-5   Employee Focus Group Script

D-6   Employee Focus Group Step by Step Guide

D-7   All Employee Survey

D-8   Step by Step Guide to All Employee Survey Administration

D-9   Design Team Development Guide

D-10   Process Tracking Database Step by Step Guide

D-11   Scientific Presentations

Interview Guide: Key Individuals

R2P Toolkit Project

Instructions and Interviewee selection:

- This interview is to be given to key individual(s) in the company who are involved in the corporate health and safety programs, training programs and other related ergonomics programs. Instructional designers, human resource trainers, and union leaders may be included. At least one supervisor should be interviewed, not only to gain a supervisor's perspective but also as a way to have supervisors participate early in the program.

- A time slot of 45 minutes to one hour will be scheduled with each of these key individuals

- Interviews are to be conducted in a confidential setting. Ideally, occur in the same location that an employee works rather than at a central office or unfamiliar setting.

- Introduction of the interviewer (the site facilitator) and his/her role in the study will be described. The purpose of this interview will be explained.

- This interview will combine structured and semi-structured questions. Supporting materials may be given to the interviewers as examples of the training programs and health and safety programs.

  - Questions highlighted in yellow should be asked of the first two interviewees; if answers seem similar and repetitive, you may choose not to ask these questions to the rest of the interviewees.

- The planned use of information gathered in these interviews will be described as part of the Research-to-Practice Toolkit Study.

- Questions to be asked of the interviewee regarding the purpose of this interview.

Purpose of this Research to Practice Toolkit Study:

Our university research team is testing the effectiveness of a set of training and evaluation tools designed to help workplace health practitioners implement a new type of program for health promotion (changes in health behaviors) and health protection (changes in workplace characteristics) of employees. A key feature of this program is that employees take a more active role than in conventional health promotion programs.

Here is essentially how it works: A small "design team" of hourly workers meets regularly with a trained facilitator [or me] to identify health hazards and health concerns important to them, and

with the help of outside experts including ergonomists and health promotion professionals, develops plans for workplace interventions to address these hazards. Every intervention plan is then proposed to a steering committee of mid/upper level managers and union representatives (if present). The Steering Committee provides the design team with guidance on the feasibility of these proposed interventions, and whenever possible, provides resources for their successful implementation and evaluation.

The Steering Committee is also empowered to identify health/safety issues/concerns, and to initiate workplace interventions. The program facilitator assists the Steering Committee with planning workplace interventions in much the same way that the facilitator assists the Design Team. A collaborative effort with the Design Team is recommended for all workplace interventions initiated by the Steering Committee.

In summary, this comprehensive participatory approach is designed to provide your organization with all of the training necessary to engage employees in new forms of workplace interventions that combine health protection with health promotion, resulting in an employee health improvement program that is both effective and sustainable after we researchers leave.

 [Review Handout—Participatory Ergonomics graphic, time commitment and parallel roles of Design Team and Steering Committee]

Purpose of this interview:

This interview is designed to gather key bits of information about your organization to plan for implementing the participatory health protection/promotion program. This interview itself is part of the Research-to-Practice Toolkit Study being conducted within COMPANY NAME. This interview will take about 30 minutes to complete. The RESEARCH TEAM will use information you provide to customize our training materials and approaches for the Design Team and Steering Committee to align with COMPANY NAME training culture and practices. We will also be conducting a focus group with line-level employees sometime in the next month or so.

We very much appreciate you taking the time for this interview, and welcome any insights you may have regarding training programs, practices, and health and safety concerns at COMPANY NAME (maybe health and safety programs—depending on who we are interviewing).

Your individual responses will not be shared verbally or in written form with others in your organization. However, we will make contact with key personnel whom you recommend for participation in that focus group mentioned earlier, or for an interview like this one.

Do you have any questions before we begin?

Targeted Questions

I. Culture and Communication: Let's begin by discussing a few general aspects of culture and communications related to workplace health, safety and ergonomics in your organization.

1. How does your agency/organization find out about health and safety problems or worker wellness issues

   a. What use does your organization make of information gathered through standard reporting mechanisms—medical visits, OSHA recordables, etc.

   b. Does your organization actively reach out to assess health and safety issues, using surveys, interviews, safety audits, etc.?

   c. Do employees openly discuss workplace health, safety, and ergonomics?

      -- does this occur in the context of meetings?

      -- does this occur when employees speak to supervisors?

2. How do employees participate in decision-making in your agency/organization?

3. What are the usual ways that employees learn about or communicate details about decisions that are made, programs, or events within this workplace? (E.g., availability of computers, e-mail, newsletters, etc.)

II. Current programs: Now we would like to learn about any existing training programs that may be in place at [COMPANTY NAME] to address employee health and wellness, safety, or ergonomics; and also general information about training programs in your organization.

4. If you have any training or other programs in place that address employee health/wellness, can you tell me about them?

5. Can you also tell me about any training or other programs that address safety, ergonomics, or job stress?

6. Who is involved in designing and delivering training programs for these? (Subject Matter Expert)

7. How are these programs evaluated?

8. How does management support/reinforce the skills, knowledge and abilities taught in a training program?

9. What determines when a new training program is created? Who decides that a new training program ought to be created?

III. Future Directions: Next we would like to get your views about how the work environment relates to health for individual employees.

10. Is there anything about the workplace here or the work activities that either gets in the way or helps with any or all of the following: (e.g., work flexibility, policies, financial incentives, communication, health programs)

- Leisure physical activity

- Nutrition

- Weight control

- Ergonomics

- Job Stress

11. What improvements in the workplace or work activities would you like to see occur?

IV. Participatory readiness: The next set of questions [PERS II] focus on certain aspects of employee involvement and organizational culture related to employee health and safety. There are 19 questions, but these will go rather quickly because for each question we only want you to respond by indicating your level of agreement with each statement. There are no right/wrong answers. [The interviewee may prefer to see a copy of the list of questions. In any case, be sure to provide the interviewee with a list of the response options that are open to them on a separate page so that the interviewee can refer to this as you go through the list of questions].

Please respond to these questions on a 1 to 5 scale, from strongly disagree to strongly agree:

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1	2	3	4	5

At my facility...

1. My organization uses work teams regularly.

2. Line-level employees and management work in teams regularly.

3. There are employees available to work together in teams.

4. There are knowledgeable employees available to assess the outcomes of an intervention.

5. There are funds available for supporting workplace change efforts.

6. Management supports the use of ergonomics in worksite design.

7. There is currently an active occupational health and safety program.

8. There are health and safety teams that meet regularly.

9. There is an active program for improving the quality of work.

10. There is currently a managerial culture that encourages all employees to get involved in decisions.

11. Suggestions from employees about work-related issues are taken seriously.

12. Suggestions from employees about work-related issues are routinely instituted.

13. It would be easy to bring together a team of front line employees to meet every other week and discuss work issues.

14. It would be easy to bring together a steering committee that included front line employees, supervisors, and managers to meet once a month or once every other month to discuss work issues.

15. Management supports the occupational health and safety program.

16. Management supports efforts to improve the health of the workforce.

17. Management is committed to providing a safe work environment.

18. Management is pro-active in providing a safe working environment.

IV. Closing:

Solicit recommendations for focus group participants.

This ends my set of prepared questions. Is there any other related information that you feel would help us work with you on this project?

FINIS

Scoring for each dimension of PERS II, if interviewee is interested:

1) Current Use of Work Teams: Mean of Items 1, and 2

   a. Description: Assesses whether your organization utilizes work teams regularly

2) Available Resources: Mean of Items 3, 4, and 5

   a. Description: Assesses whether your organization has enough funding and your employees have enough knowledge to work together to assess the outcomes of an intervention

3) Current Programs in Safety and Quality: Mean of Items 6, 7, 8, and 9

   a. Description: Assesses whether your organization both has the funds for and supports the regular meetings of current programs in safety and quality

4) Current Policies Toward Employee Participation: Mean of Items 10, 11, and 12

   a. Description: Assesses whether management encourages employees to make decisions, and whether these decisions are supported and instilled

5) Ease of Teambuilding: Mean of Items 13 and 14

   a. Description: Assesses the feasibility of creating a design team and a steering committee to improve employee health and safety

6) Management Support of Employee Health and Safety, Mean of Items 15, 16, 17, and 18}

   Description: Assesses management's support, commitment, and action in promoting employee health and safety

STEP BY STEP GUIDE: KEY PERSONNEL INTERVIEWS

OVERVIEW

Conducting interviews with key personnel is the first main step in establishing a participatory ergonomics and health promotion (PExHP) program using the CPH-NEW Toolkit. It allows you, as the program facilitator, to systematically gather information about the organization and how it functions, and to make contact with people in the organization whose support may be necessary for the success of the PExHP program.

Interviews will provide you with most of the information you need for the next implementation steps: forming a Steering Committee and conducting one or more focus groups. During the interviews you will learn about existing employee health protection and health promotion programs, what systems are in place to identify training needs, and what level of training and support are needed for company managers to help company managers enable a participatory program be successful.

The interviews also help to accomplish two other important goals. The interviews will allow **middle and upper level managers** to provide their input and become more familiar with the goals of the participatory program. This is extremely important for garnering their support for future interventions and resources that will be requested by the Design Teams for making workplace changes. Second, the interviews will provide you with names of people who could be recruited to serve on the program Steering Committee, and names of people who could be recruited to participate in a focus group.

HOW TO PLAN AND CONDUCT KEY PERSONNEL INTERVIEWS

STEP 1: Identify appropriate interview participants

Consult with your organization's employee health contact to identify at least three the key middle and upper level managers to be interviewed. The exact number will vary based on the size and structure of the organization, as well as the target groupof employees for the participatory initiative. In general it is better to err on the side of interviewing too many people rather than too few. Consider these criteria for prospective interviewees:
- Prominence within the organization
- Access to information useful to health and safety interventions (e.g., EHS & HR personnel)
- Ability to help generate acceptance of the project and its elements
- Prospective Steering Committee member
- Union leaders (if unions are present in the organization)
- Opinion leaders within target employee group(s)
- Ability to suggest participants for a focus group(s) and a future Design Team
- Currently involved in the organization's health/wellness/safety committees

STEP 2: Adapting the *Key Personnel Interview Guide* for the organization

The *Key Personnel Interview Guide* in the CPH-NEW Toolkit provides a set of interview questions that have been used successfully in other workplaces. However, it may be necessary to adapt these to match the needs and culture of the organization. Your initial contact(s) with the organization (likely a human resources manager, a health and safety professional, or the wellness champion) is a good person to ask to review the questions for suggestions about modifications that would make the interview more effective. The questions were designed for an interview lasting 30-45 minutes, although the exact time needed will vary from person to person.

STEP 3: Plan the logistics

Select a location that is private and comfortable; the interviewee's office is ideal if available. If there are windows, be sure there are shades or blinds that can be lowered for privacy.

Select a time during the workday that is convenient for the interviewee. For some worksites, lunch time may be best.

It is often possible to schedule multiple interviews in one day. Allow adequate time between scheduled interviews because the lengths of an interview can vary widely depending on the personal style of the interviewee. It is very important when doing multiple interviews that you write your notes between interviews while the information is fresh in your mind. For that reason, avoid the temptation to schedule interviews any closer than 60 minutes apart.

STEP 4: Recruit participants

Contact prospective interviewees 1-2 weeks in advance of the target interview date to invite their participation. Provide a brief description of the project, the purpose of the interview, length of time requested, and highlight their importance for contributing:
   a. Background information on organizational structure and culture
   b. Information on some current employee health initiatives
   c. Help in streamlining program introduction, improving prospects for its acceptance

Confirm the date, time, and location with an email or letter, and **send a reminder** to the participant about the interview 2-3 days in advance of appointment.

STEP 5: Conduct the interviews

Ask permission to take notes. Assure the interviewee that you are not recording what they say verbatim, and that the results from several interviews will be combined so that it will not be possible to determine who provided a specific piece of information. If notes are taken by hand, use a small pad (i.e., rather than a clipboard). If notes are typed directly into a laptop computer,

try to set up the computer so that the screen is in view of the interviewee. You might offer to share your notes on specific points, saying that "you want to be sure to get everything right."

Thank the participant; ask if other information should be provided. Request help with introducing the program, if this seems appropriate

STEP 6: Summarize the interview findings

At the earliest opportunity and while the session is still clear in your mind, create a short document that summarizes the main points/themes of the interview and clearly notes the project directions suggested by the interviewee.

References:
Add 2-3 websites or books

W R C L

Worksite   Readiness   Checklist

UMASS LOWELL

Organizational Assessment for Worksite Readiness for Participatory Health Promotion and Health Protection

Study Site:

Interviewee: Administrator, Director of Nursing. Wellness champion

Name of the organization : _____

What is your current job? *(Please specify)* _____

Please specify the number of employees by type of schedule:
Part time_____
Full time _____
Per diem/Hourly _____
Others_____

If YES, do you use agency personnel?

○ On a long term basis	○ To fill in for vacationing or sick employees	○ Other_____

Mission and Goals Related to Employee Health

1. Does the workplace have a mission statement regarding employee health and wellness?

| ○ | Yes | ○ | No | ○ | Don't know |

Comments: _____

2. Does the workplace have a planning document or other written measurable goals and objectives for employee wellness?

| ○ | Yes | ○ | No | ○ | Don't know |

Comments: _____

Health Promotion Activities

3. Does the workplace provide periodical messages from the top management supporting health promotion among employees?

| ○ | Yes | ○ | No | ○ | Don't know |

Comments: _____

3a. **If Yes,** is it

| ○ | Electronic/Email | ○ | Posters | ○ | Newsletter | ○ | Other (specify) _____ |

4. Does the workplace offer any type of onsite wellness activities to improve employees' health?

| ○ | Yes | ○ | No | ○ | Don't know |

Comments: _____

4a. **If Yes,**
Please check all activities offered at the workplace.

○	Exercise / walking programs
○	Health fairs
○	Dietary information
○	Team sports
○	Other (Please specify)

5. Does the workplace have a wellness committee or any other type of committee (e.g. advisory committee) addressing employee's health?

| O | Yes | O | No | O | Don't know |

Comments: _____

---

6. Does the workplace encourage active participation in the on-site wellness programs offered for employees?

| O | Yes | O | No | O | Don't know |

Comments: _____

    6a. **If Yes,** is the encouragement through?

O	Financial incentives
O	Recognition at work
O	Reduction in premium
O	Time off/Release time
O	Other (Please specify)

---

7. Does the workplace encourage active participation in the off-site wellness programs offered for employees?

| O | Yes | O | No | O | Don't know |

Comments: _____

    7a. **If Yes,** is the encouragement through?

O	Financial incentives
O	Recognition at work
O	Reduction in premium
O	Time off/Release time
O	Other (Please specify)

---

8. Does the workplace have explicit policies or procedures that promote and support health promotion activities for employee health?

| O | Yes | O | No | O | Don't know |

Comments: _____

    8a. **If Yes,** do these policies include?
    Please check all that apply

O	Flexible work time/participation during work time
O	Childcare provided during wellness activities
O	No scheduled meeting over lunch
O	Nutrition standards for vending machine contents
O	Other (Please specify)

3

9. Does the workplace have a designated Wellness champion?

| O Yes | O No | O Don't know |

Comments: _____

9a. **If Yes,** is the wellness champion?

| O Paid | O Volunteer | O Other | O Not Applicable |

Comments: _____

10. Does the workplace recognize/promote employees who champion overall health (could include recognition in employee newsletters, thank you letters, appreciation luncheons or other promotional events, recognition awards, etc.)?

| O Yes | O No | O Don't know |

If Yes, please specify: _____

11. Are opportunities for health promotion activities available to all employees: please answer all that apply?

All shifts	O Yes	O No	O Don't know
Part time workers	O Yes	O No	O Don't know
Workers at different locations	O Yes	O No	O Don't know
Others	O Yes	O No	O Don't know

Comments: _____

12. Does the workplace offer employee flexibility with jobs?

| O Yes | O No | O Don't know |

Comments: _____

12a. **If Yes,**
Does the time flexibility for employees include any of the following?

O	Shortened time or time off for family illness
O	Flexible shifts (i.e., 10-12 hrs, and discretion over schedule and days off)
O	Choice of shifts
O	Time off for personal
O	Other (Please specify) _____

13. Does the workplace provide job flexibility for employees to participate in wellness activities?

| O | Yes | O | No | O | Don't know |

Comments: _____

   13a. **If Yes,** does the flexibility include?

O	Shortened time or time off for family illness
O	Flexible shifts (i.e., 10-12 hrs, and discretion over schedule and days off)
O	Choice of shifts,
O	Time off for personal
O	Other (Please specify) _____

14. Does the worksite provide health screening (e.g. BP, Cholesterol, glucose, etc) for employees?

| O | Yes | O | No | O | Don't know |

Comments: _____

   14a. **If Yes,** how often is the screening provided? _____

15. Does the workplace provide health fairs on-site for employees?

| O | Yes | O | No | O | Don't know |

Comments: _____

   15a. **If Yes,** how often are the health fairs? _____

16. Does the workplace have educational sessions (e.g. "lunch and learn") on health related issues to raise awareness and motivation among employees (in addition to professional training)?

| O | Yes | O | No | O | Don't know |

Comments: _____

   16a. **If Yes,** how often are the education sessions? _____

17. Does the workplace have a protocol for medical emergencies at the worksite?

| O | Yes | O | No | O | Don't know |

Comments: _____

18. Does the workplace provide first aid training to employees?

| O | Yes | O | No | O | Don't know |

Comments: _____

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19. Does the workplace provide assault prevention/management training for employees?

| ○ Yes | ○ No | ○ Don't know |

Comments: _____

20. Does the workplace have substance abuse policies?

| ○ Yes | ○ No | ○ Don't know |

Comments: _____

21. Are there any situations in which the workplace conducts drug-testing?

| ○ Yes | ○ No | ○ Don't know |

Comments: _____

    21a. **If Yes,** is the drug testing for? (Please check all that apply)

○	New job applicants
○	For cause
○	At random
○	Don't know
○	Other (Please specify)

22. Does the workplace have alcohol abuse policies?

| ○ Yes | ○ No | ○ Don't know |

Comments: _____

23. Does the workplace have a written smoke-free work environment policy?

| ○ Yes | ○ No | ○ Don't know |

Comments: _____

    23a. **If Yes,** what is the extent of the smoking ban?

○	A partial ban on smoking (designated or de facto smoking areas in the building)
○	Smoking allowed on the grounds but not in the building
○	A total ban throughout the premises (including grounds)
○	Don't know

Comments _____

6

24. Does the workplace provide any type of financial or other incentives for not smoking?

| O | Yes | O | No | O | Don't know |

Comments: _____

25. Does the workplace provide free or reduced price meals for employees?

| O | Yes | O | No | O | Don't know |

Comments: _____

26. Do the employees receive any discount for gym membership?

| O | Yes | O | No | O | Don't know |

Comments: _____

Health Protection and Ergonomics Activities

27. Does the workplace carry out safety assessments like regular inspections of equipment and facilities? (This documentation could include maintenance records or OSHA checklist.)

| O | Yes | O | No | O | Don't know |

Comments: _____

27a. Is this inspection required for state licensing or corporate licensing?

| O | Yes | O | No | O | Don't know |

Comments: _____

28. Are there written materials about health and safety at work to educate employees?

| O | Yes | O | No | O | Don't know |

Comments: _____

29. Are there mandated health and safety postings as required by the state laws?

| O | Yes | O | No | O | Don't know |

Comments: _____

30. Are health and safety topics at work communicated to the employees frequently?

O	Yes		O	No		O	Don't know

Comments: _____

If Yes,
30a. In what way are these communicated?

O	Seminars	O	Posters	O	Newsletters	O	Other (specify)

30b. How frequently is it communicated? _____

31. Do new workers get training/advise on how to be safe on the job?

O	Yes		O	No		O	Don't know

Comments: _____

32. Does the workplace have an injury reduction program?

O	Yes		O	No		O	Don't know

Comments: _____

33. Besides the injury reduction program, is there an ergonomics education program for employees at the workplace?

O	Yes		O	No		O	Don't know

Comments: _____

Work Organization Policies

35. Does the workplace have maternity leave after pregnancy/delivery or adoption (paid extended leave after short term disability payment ends)?

O	Yes		O	No		O	Don't know

Comments: _____

36. Does the workplace provide vacation time allowances for employees?

O	Yes		O	No		O	Don't know

Comments: _____

37. Does the workplace provide leave policies that cover family emergencies/responsibilities beyond the family leave act (e.g., total or partial paid leave greater than 12 weeks)?

O Yes   O No   O Don't know

Comments: _____

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39. Does the workplace allow break time for employees during working hours?

O Yes   O No   O Don't know

Comments _____

40. Does the workplace allow job rotations for employees?

O Yes   O No   O Don't know

Comments: _____

If Yes,
40a. What percentages of workplace employees are allowed for job rotation?

O <25%   O 25-50%   O 50-75%   O 75-100%   O Don't know

40b. How are job rotations allotted? Check all that apply

O At request   O By seniority   O By status
Comments: _____

41. Does the workplace allow informal social events such as employee birthdays, promotions, weddings, summer "cookouts" etc?

O Yes   O No   O Don't know

Comments _____

42. Does the workplace have formal policy and clear procedures to prevent violence at worksite?

O Yes   O No   O Don't know

Comments: _____

43. Does the workplace have a formal policy and clear procedures to prevent sexual harassment?

O Yes   O No   O Don't know

Comments: _____

44. Does the workplace provide personal learning opportunities for employees (through continuing education)?

| O | Yes | O | No | O | Don't know |

Comments: _____

44a. **If Yes,** is it?

O	Seminars
O	Workshops
O	Educational credits
O	Other (Please specify)

45. Does the workplace have a Union?

| O | Yes | O | No | O | Don't know |

Comments: _____

If Yes,
45a. What percentage of employees represent by a union?

O <25%   O 25-50%   O 50-75%   O 75-100%   O Don't know
Comments: _____

All survey responses will be kept **Completely Confidential.**

Organizational Observation for the Assessment of Worksite Readiness for Participatory Health Promotion and Health Protection Program

Study Site:

Observer: _____ **Date:**_____

Name of the organization : _____

Size of the organization:

○	<50 employees
○	50 - 100 employees
○	101 – 200 employees
○	>200 employees

Address: **Phone:**

Site description: Rural _____**Suburban** _____ **Urban** _____

Is there visible demographic segregation? (Get document from site)
Gender: ○Yes   ○No   *Specify*_____
Race: ○Yes   ○No   *Specify*_____

Is the pacing of job? ○ Self   ○ Social/ Peer   ○ Management driven

Physical Environment

1. Is the workplace all or part of the building?

| ○ All | ○ Part | ○ Not applicable |

Comments: _____

2. Does the workplace spread out over multiple physical facilities?

| ○ Yes | ○ No | ○ Not applicable |

Comments: _____

If Yes,
2a. Approximate distance for walking between buildings? _____ (in yards)
Comments: _____

3. Does the workplace have more than one floor?

| ○ Yes | ○ No | ○ Not applicable |

Comments: _____

4. Does the workplace have elevator service for all floors?

| ○ Yes | ○ No | ○ Not applicable |

Comments: _____

5. Are all the floors connected by stairs?

| ○ Yes | ○ No | ○ Not applicable |

Comments: _____

6. Are the stairs visible from the entrance?

| ○ Yes | ○ No | ○ Not applicable |

Comments: _____

7. Are the stairs wide and well lit?

| ○ Yes | ○ No | ○ Not applicable |

Comments: _____

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8. Are the stairs appealing and comfortable with railings?

| O Yes | O No | O Not applicable |

Comments: _____

9. Are the workplace corridors wide and well lit?

| O Yes | O No | O Not applicable |

Comments: _____

10. What is the general noise level at the worksite?
O Can talk to someone nearby with ease   O Need to raise voice to be heard
Comments: _____

Nutritional Facilities

13. Are there vending machines offering healthy food and snacks* at workplace?
(* Low calorie and low fat food)

| O Yes | O No | O Not applicable |

Comments: _____

14. Are there vending machines offering fruit/vegetable juice, water and other healthy low calorie beverages?

| O Yes | O No | O Not applicable |

Comments: _____

15. Are the healthy items prices comparable* to the less healthy items in the vending machine? (* Comparable is 25% higher or same price between the two products)

| O Yes | O No | O Not applicable |

Comments: _____

16. Does the workplace have a canteen/cafeteria?

| O Yes | O No | O Not applicable |

Comments: _____

17.

18. Does the cafeteria offer a choice of low calorie and low fat food?

a. Salads, fruits, vegetables?   ◯Yes   ◯No   ◯Not applicable
b. Sandwiches with low fat /calories (chicken, roast beef, turkey etc)?
                        ◯Yes   ◯No   ◯Not applicable
c. Low fat dairy products?   ◯Yes   ◯No   ◯Not applicable

---

19. Does the food menu offered provide nutritional information (nutritional label with calories etc)?

◯ Yes   ◯ No   ◯ Not applicable

Comments: _____

---

20. Are the healthy items' prices comparable* to the non-healthy items in the cafeteria?
(* Comparable is 25% higher or same price between the two products)

◯ Yes   ◯ No   ◯ Not applicable

Comments: _____

---

21. Does the workplace have common rooms (social and food consumption area) for employees?

◯ Yes   ◯ No   ◯ Not applicable

Comments: _____

---

22. Is the common/lunch room equipped with a microwave?

◯ Yes   ◯ No   ◯ Not applicable

Comments: _____

---

23. Is the common/lunch room equipped with a refrigerator?

◯ Yes   ◯ No   ◯ Not applicable

Comments: _____

---

24. Do all employees have access to this common area all the time?

◯ Yes   ◯ No   ◯ Not applicable

Comments:

Smoking Supplies

25. Does the workplace have a cigarette vending machine?

◯ Yes   ◯ No   ◯ Not applicable

Comments: _____

Exercise Facility

26. Does the workplace have a gym / recreation center or workout area for employees?

| O Yes | O No | O Not applicable |

Comments: _____

If Yes,
26a. Does the workout area have TV?

| O Yes | O No | O Not applicable |

Comments: _____

26b. Does the workout area offer music?

| O Yes | O No | O Not applicable |

Comments: _____

26c. Does the workplace have showers, lockers and changing rooms?

| O Yes | O No | O Not applicable |

Comments: _____

26d. When is the workout area accessible by employees? *Please check all that apply.*

| O Before work | O After work | O During work | O 24 hours |

Comments: _____

27. Does the workplace offer a structured exercise program (e.g. aerobics, yoga, personal training, dancing etc)?

| O Yes | O No | O Not applicable |

Comments: _____

28. Is there a certified fitness instructor available?

| O Yes | O No | O Not applicable |

Comments: _____

29. Does the workplace sponsor/support any employee team sports?

| O Yes | O No | O Not applicable |

Comments: _____

Relaxation Facilities

31. Does the workplace have a quiet or meditation room for employees?

⊙	Yes	⊙	No	⊙	Not applicable

Comments: _____

31a. If Yes, does it include?
- ○ Massage chair
- ○ Dim lighting
- ○ Aromatherapy
- ○ Soft music
- ○ A place to nap
- ○ Other, Please specify_____

32 Is the relaxation area accessible by employees? *Please check all that apply.*

○	Before work	○	After work	○	During work	○	24 hours

16

Signs and Posters

33. Are there signs encouraging use of stairs at the worksite?

◯ Yes   ◯ No   ◯ Not applicable

Comments: _____

34. Does the workplace have signs or posters encouraging healthy habits (physical activity, healthy eating, stress management etc.)?

◯ Yes   ◯ No   ◯ Not applicable

Comments: _____

34a. **If Yes,** please indicate signs or posters and on what topics?

_____

35. Does the workplace have bulletin boards for posting health information for employees?

◯ Yes   ◯ No   ◯ Not applicable

Comments: _____

Healthcare Facilities

36. Does the workplace have an employee health clinic on the premises?

◯ Yes   ◯ No   ◯ Not applicable

Comments: _____

36a. **If Yes,** is it?
   ◯ Part-time   ◯ full time
Comments: _____

37. Is there on call medical staff on-site that employee has access to?

◯ Yes   ◯ No   ◯ Not applicable

Comments: _____

37a. **If Yes,** is it?
   ◯ Part-time   ◯ full time
Comments: _____

Other Facilities

38. Does the workplace have childcare/daycare facilities for employees?

| O | Yes | | O | No | | O | Not applicable |

Comments: _____

If Yes,
38a. Is the facility provided?
    O Part-time   O full time
Comments: _____

38b. Is the facility provided?
    O On-site   O Off-site
Comments: _____

38c. Does the facility have a safe and appealing environment?

| O | Yes | | O | No | | O | Not applicable |

Comments: _____

38d. Is there a supervisor present at all times in the facility?

| O | Yes | | O | No | | O | Not applicable |

Comments: _____

Physical Environment Surrounding the Workplace

39. Does the workplace have an open safe surrounding area for any physical activity (sports or exercise)?

| O | Yes | | O | No | | O | Not applicable |

Comments: _____

40. Does the workplace have safe walking paths around workplace?

| O | Yes | | O | No | | O | Not applicable |

Comments: _____

41. Does the workplace have ample parking space for all employees?

| O | Yes | O | No | O | Not applicable |

Comments: _____

42. Please specify the approximate walking distance from the parking area to the workplace buildings: _____ (in yards)
Comments: _____

43. Are there bicycle racks available for employees to park their bikes?

| O | Yes | O | No | O | Not applicable |

Comments: _____

43a. **If Yes,** how many bicycle racks are provided in the facility?

44. Are there any fitness centers or community recreation services (like YMCA) in close proximity of the workplace?

| O | Yes | O | No | O | Not applicable |

Comments: _____

45. Are these community recreation facilities accessible to all employees? *Please check all that apply.*

| O | Before work | O | After work | O | During work | O | 24 hours |

Comments: _____

46. Are there public recreational areas (e.g. park, playground, etc) in close proximity to the workplace?

| O | Yes | O | No | O | Not applicable |

Comments: _____

47. Do employees have access to healthy food and snacks in close proximity of workplace?

| O | Yes | O | No | O | Not applicable |

Comments: _____

48. Are there bars and liquor stores within walking distance of the workplace?

| O | Yes | O | No | O | Not applicable |

Comments: _____

Health Protection and Ergonomics

49. Is there an obvious presence of an ergonomics specialist at the workplace?

○ Yes   ○ No   ○ Don't know

Comments: _____

50. Are there obvious ergonomic problems in the work area (example: bending, twisting, desk height or others)?

○ Yes   ○ No   ○ Don't know

Comments: _____

51. Is there an obvious presence of an office safety specialist?

○ Yes   ○ No   ○ Don't know

Comments: _____

52. Is ergonomic equipment visible/ in use?

○ Yes   ○ No   ○ Don't know

Comments: _____

Housekeeping

[Note: Section to be added which is site-specific]

Teamwork

58. Are there a number of employees working in proximity to each other that could work together in teams?

○ Yes   ○ No   ○ Don't know

Comments: _____

59. Do the employees who work in proximity to each other interact with each other?

○ Yes   ○ No   ○ Don't know

Comments: _____

60. If there is teamwork visible, what is the number of employees involved?

_____

Comments: _____

61. Does the staff appear to be unusually hurried?

○ Yes   ○ No   ○ Don't know

Comments: _____

62. Does the staff appear to have time to take breaks and relax during their working hours?

○ Yes   ○ No   ○ Don't know

Comments: _____

Organizational Characteristics

64. Are the supervisors constantly watching/scrutinizing the employees' work?

○ Yes   ○ No   ○ Don't know

Comments: _____

65. Is there much communication between staff at the change in shifts?

○ Yes   ○ No   ○ Don't know

Comments: _____

66. What is the average age of the staff? _____

Comments:

Guiding the Healthy Workplace Project:
The Steering Committee Creation, Development, Training Tool

Many workplaces have initiated programs that encourage labor management cooperation. This is a guide for the creation of a group to oversee workplace health projects that include both job health and safety and personal wellness. There are basic goals:

- A Steering Committee must have trust and commitment from senior management and a commitment to its longevity.
- A Steering Committee must be sufficiently independent so that it can make decisions in a timely way that will be followed through.
- It is useful to have a structure so that the Steering Committee can survive reorganizations, lay-offs, promotions, and short-term economic conditions.
- A Steering Committee should be sufficiently flexible to maintain its activities during working hours while still being able to be responsive to other shifts or facility locations.

This guide provides a sample approach to setting up a Steering Committee. Workplaces are very different in size, type of work activities, levels of authority, and skills of personnel (for example a public agency and a small machine shop), and so you may want to modify these steps based on your particular needs and resources.

The following flowchart will help in both the creation and selection of the Steering Committee. **[insert creation flowchart here when everything is printed out]**

The following text accompanies the Steering Committee Early Development Process flowchart >>

1. Obtain/Create Organizational Chart

Either ask your primary contact/wellness champion or upper management for a current organizational chart, or sit down with your primary contact/wellness champion and create one. The chart can help you identify key people, positions, or divisions/units to include in the steering committee.

Make a list of first choices, as well as a list of alternatives. A steering committee will typically have 6-8 members, with more or less depending on the size of the company.

2. *Apply Selection Tool for SC Members*

After you have identified possible candidates, apply the **selection tools for SC members** (see Tables 1 & 2) to ensure that your SC includes:

- Individuals of who occupy different levels and roles within the organization
- Individuals who are knowledgeable, or interested, in the area of health promotion/protection
- Individuals that have authority to authorize programs and funding as needed
- Individuals that represent and have the respect of a large number of the workforce
- Individuals who would be able to coordinate activities of the Healthy Workplace Project with standing committees such as EHS.

3. *Discuss with Champion*

Bring your preliminary list of candidates to your primary contact/wellness champion. The wellness champion may have more insight into whether your list is exhaustive, whether the individuals you have chosen will work well together, etc. Discuss the list, and finalize your top candidates.

4. *Obtain Management and Union Approvals*

Next, bring your list of potential SC members to upper management and to local union leadership in a unionized setting. You should also provide a list of the general **duty descriptions, roles, goals, and responsibilities** of the SC (see Appendix 1), so that they are knowledgeable about the general tasks of the SC. In addition to approving the list of potential SC members, management must approve the time commitment of the SC, as well. Time commitment includes frequency of meetings (most likely monthly at first, and then quarterly), as well as the duration of each meeting (most likely about an hour each).

5. *Circulate General Announcement*

A general announcement should be sent to each member of the organization. The announcement should include:
- The endorsement of a high-authority individual (upper management or the organizational owner) and union (where applicable)
- A general overview of what the SC does (see Appendix 1)
- A notification that a subsequent invitation will be going out to the potential SC candidates

6. *Send Invitations or talk to Candidates*

Once the general announcement has been circulated, **invitations** can be sent out to your list of SC members. If individuals decide not to participate in the SC, send out invitations to your list of alternatives. Alternately, personal meetings from the champion may be more effective at both showing the level of interest in the candidate and in answering questions about the project. When candidates (particularly non-management) say they are interested, it may be useful to discuss their participation with supervisors to ensure that they will facilitate the time needed for the project.

General Announcement about Formation of the Steering Committee
(Draft version, updated 8-May-10)

(This memo is to be sent to all employees from the highest-ranked person in organization possible, and as appropriate, co-signed by a union representative and the organization's health and safety director.)

MEMO

To: All Employees
From: _____
RE: New Workplace Health Promotion Program
Date: _____

(COMPANY) is committed to promoting health and a healthy working environment for its employees. As an expansion of our wellness program, and in coordination with our health and safety program, (COMPANY) has decided to make a further investment in employee health by agreeing to work with researchers from the University of Massachusetts and University of Connecticut to launch a new workplace health program. This program involves "front line" employees directly in identifying issues and developing solutions for improving health in the workplace. The program will use a combination of health promotion activities (helping employees adopt healthier lifestyles) with workplace health and safety interventions (using ergonomics to improve tools, equipment, procedures, and work organization) to improve health and wellbeing.

University researchers have already interviewed several (COMPANY) managers and have conducted two focus groups with _____ to better understand how to introduce this new program at (COMPANY). The next step is to form a Steering Committee with representatives from across (COMPANY). With assistance from a university researcher assigned to our company for the next year and a half, this Steering Committee will be charged with reviewing and guiding the implementation of workplace interventions to improve employee health. The Steering Committee will interact with other (COMPANY) committees as appropriate to assure coordination with other mission critical priorities.

One of the main functions of the Steering Committee is to review proposals for workplace interventions that are proposed by a separate group of (COMPANY) _____ employees that is called a <u>Health Design Team</u>. The Health Design Team will also meet with university researchers to learn how to generate proposals for improving employee health. Employees working together in this way will enable (COMPANY) to harness the knowledge and experience of our _____ employees to improve health and wellbeing for employees, and ultimately the company.

Over the next few weeks, invitations will be sent out asking (COMPANY) employees to serve on the Steering Committee for this new program; two individuals will be asked to serve as its co-chairs. Formation of this Steering Committee will be followed by administration of a confidential employee survey to help identify employee health needs and concerns. Finally, a Health Design Team will be formed, which will allow the complete program to get up and running in the next few months.

If you are invited to serve on the Steering Committee or Health Design Team, we hope you will seriously consider this and agree to be part of this exciting new program from which we can all benefit from. Since this program is also part of a university research study, you will be asked to sign a consent form explaining that your participation is voluntary, and you can choose to withdraw at any time. Additional details about the program will be announced later. However, if you have any questions about any aspect of this new program at the present time, please contact _____ at (COMPANY), the university site facilitator (_____ e-mail address), or Professor Robert Henning at robert.henning@uconn.edu.

Appendix 1

Steering Committee Roles, Goals, & Responsibilities

Program Overview

The steering committee exists to provide resources (as needed) for interventions, to assess feasibility of proposed interventions, to interface with senior management, and to oversee the general viability of a healthy workplace program. It exists to develop and support the design team but can also initiate interventions, particularly if they are aimed at the level of supervisors and management. The Steering Committee is a stakeholder of all interventions, whether initiated by the Design Team or Steering Committee. Interventions initiated by the Steering Committee will benefit from collaboration with the Design Team, as depicted in Diagram 1.

Goals

The goals of the steering committee overlap with the goals of the design team, but the Steering Committee also has a different set of oversight goals.

Critical Goals

- protect long term sustainability of program
- improve worker health
- develop communications between design team and workforce and management
- determine the appropriate use of resources (cost-effective)
- support program so they accomplish participatory goals (operational in nature)

Desirable Goals

- influence measures of productivity
- support design team (nurture activities, new ideas)

Table 1

A Steering Committee should be representative of several different entities, personalities, and positions of power throughout your organization.

Eventually, it is important to select and maintain a *balanced committee*, identifying individuals of different ranks, shifts, and levels such that the Committee is representative of the entire organization. Think about these issues as you select Steering Committee Members.

There are also a few attributes suggested to be critical to the success of a Steering Committee. In the table below, please try to identify an individual who best fits each Steering Committee Attribute, remembering to keep in mind the suggestions above regarding a *balanced and representative committee*. An individual may be named in more than one category.

Steering Committee Attribute	Is an Opinion Leader	Has an Active Interest in the Area	Gets Along Easily with Others	Other previous changes here -- committed to health, etc.	Has Fiscal Authority	Has Social or Communicative Power	Has Knowledge in the Area
Representative Name							

Table 2

Under each category below, list additional representatives who you believe would be beneficial committee members:

Category	Management	Line Worker	Human Resources	EHS	Other
Representative Name(s)					

Steering Committee Early Development Process
Draft 23-April-10, Nicole Johnson & Megan Dove-Steinkamp & Tim & Rob

The following text accompanies the flowchart for the Steering Committee Early Development Process.

Finalize Steering Committee (SC) Membership
At this point, you should have finished this step.

Choose/Invite Co-chairs (2)
Choose two individuals whom you think would make capable co-chairs to the SC. To assist your decision, you may want to review the list of **co-chair responsibilities** (see Appendix One). Having one or two alternatives may be helpful as a back up in case your first choices are not able to be co-chairs.
Next, meet with your primary contact/wellness champion to review your choices for co-chair, and determine if other approvals may be necessary within the organization (CEO, release time by manager, etc.). Lastly, invite these individuals to act as co-chairs, and go down your list as needed.

Facilitator calls 1st Meeting(s)
Consult with your primary contact person/wellness champion about calling the first SC meeting. Holding meetings on a regular basis may require agreement and support from a number of mid-level managers. When you call the first meeting, you should circulate an **agenda** (see Appendix 2, *yet to be developed*) to the SC members so that they have an understanding of the meeting's events.

Initial Meeting(s)

NOTE: You may want to split this initial meeting into two separate meeting times, as it may take 1-2 hours to get through all of these agenda items.

During the first meeting, you should:
- Provide a general orientation to the SC. This includes a general overview of CPH-NEW (based on the information you have received regarding the grant) and an overview of the expanded role of health promotion and health protection, so that the SC understands their main functions in the organization as a whole.
- Orient the SC to the functions and roles of the Design Team. Include a review of the **Process Wheel** (see Appendix 3) that the Design Team utilizes.
- Review the roles, goals, and responsibilities of the SC. The Steering Committee Creation tool will provide you with this information.
- Review the focus group summaries with the SC, as well as key findings from the All-Employee Survey.
- Decide if there are any needed revisions before survey administration, including: suggested edits for necessary wording changes to match culture/demographics of the organization, special interest areas that need expansion through addition of

existing Toolkit modules (e.g., workplace stress), or other requests that the SC members may have. However, it must be emphasized that the survey is a scientific tool that has been carefully developed as a comprehensive assessment tool. Adding additional items is fine but making changes to existing text is not expected to be necessary. <<not sure of sequence here, since bullet above makes it sound like the survey has already been completed>>

- Choose Design Team members (**separate tool yet to be developed**). The group should list their first choices, as well as alternatives, in case the first choices are not able to join the Design Team.
- Hand out a **generic sample agenda** (see Appendix 4, **yet to be developed**), so that the SC can see what a typical SC meeting will be like in the future.

Hold Regular Meetings

After the initial meeting, you should begin to hold regular meetings with the SC at least monthly.

The Steering Committee Training Tool
8-Jun-10

Once all members of the Steering Committee have been selected, it is important to present a formal introduction to its purpose and intended function. This is a guide for said training. There are basic goals:

- A Steering Committee must understand its role in the participatory (PExHP) program.
- A Steering Committee must understand the intervention design process.
- A Steering Committee must be able to evaluate intervention proposals developed by the Design Team.
- A Steering Committee must be able to make constructive recommendations and to provide useful and helpful feedback to the Design Team.
- A Steering Committee must be able to assist in the evaluation of interventions in ways that will provide feedback to the Design Team that can be used to improve/refine the intervention for greater effectiveness/success.
- A Steering Committee must be given the opportunity to discuss and establish its own basic operating procedures.

This guide provides a sample approach to training a Steering Committee. Training necessarily begins with a training needs assessment. It is important that the Steering Committee training program is consistent with the company culture and that each member's training history (e.g.,

type and amount of previous training in management style, interpersonal communication, providing feedback, etc.) is considered. Based upon the information collected during the Key Personnel Interviews, you may want to modify the following steps based on your particular needs and resources.

The following flowchart will help with the training of the Steering Committee.
[insert creation flowchart here when everything is printed out]

<<The following text accompanies the Steering Committee Training flowchart.>>

7. *Welcome and Introductions*

The instructor should formally greet training attendees, providing a brief overview of the purpose of the training, as well as his/her title/qualifications. Depending on the size of your organization, members of the Steering Committee may not be familiar with one another. Ask each member to briefly introduce his or herself.

8. *Module 1: Program Orientation*

After everyone has been introduced, the training should proceed *to Module 1: Program Orientation*. This module should provide a comprehensive overview of the PExHP program and its main objectives, including:

- Unique aspects of PExHP approach (grass-roots participatory approach; workplace changes occur in combination with employee efforts to adopt healthier behaviors)Ergonomics and Health Promotion (how these basic approaches complement each other)
- Long-term sustainability of the workplace health program (employee and management participation is expected to increase over time, with individuals in the host organization gradually assuming responsibility for program administration and management)

9. *Module 2: The Design Process*

The Steering Committee must understand the design process; their role (as well as role of both DT, facilitator). Introduce the Process Wheel (Appendix). Walk SC through each step of a design cycle, explaining what happens in each step of the cycle. Explain why the design cycle usually must repeat before an intervention becomes completely successful.

Explain that, at the beginning of the program, the DT will be coached to develop proposals for interventions which are relatively straightforward, do not demand significant resources, and are easy to implement in a short period of time. Starting out in this way, individuals in both the DT and the SC can learn their respective roles in the creation and development of workplace interventions and what must happen for these interventions to be successful. Early program successes will also build confidence in the program throughout the host organization, and as the program becomes better established it should become easier to marshal resources for future interventions, even when these are more challenging and take longer to implement.

10. Module 4: Evaluating an Intervention Proposal from the DT

The Steering Committee must be able to evaluate an intervention proposal, and if it is unable to approve it as proposed, provide constructive feedback on how it could be enhanced or changed so that it would be approved. This requires the SC to consider how proposals affect other organizational activities, objectives, resources (including personnel – e.g., health, turnover, absenteeism, morale, safety and health climate, etc.), and any potential long-term consequences of not taking action (e.g., increased workers compensation costs).
Members of the Steering Committee are likely to be more knowledgeable about how to construct a sound case for interventions within their organization. Therefore partly as a training exercise, the SC can be asked to identify and prioritize features of a good business case for workplace interventions to improve employee health. These features can be shared with the DT to help guide future proposal development efforts.

As the SC to determine the format of a food business case from the DT. This will typically require tailoring the following four aspects of a typical business case in order to meet the needs of the host worksite:

1) **Cost**: Use of any organizational resource usually has an associated cost. Estimates for the time of employees are relatively easy to obtain while some costs are much harder to estimate (effect of lower morale on productivity). Nonetheless, a strong proposal will show that the costs of an intervention are not unreasonable given the return on investment (see #4, below).

2) **Effectiveness**: Need to be able to show that an intervention is likely to achieve its goals. For example, for a weight loss program to be considered effective, it may be necessary to show that the amount of expected weight lost over the period of the program will be significant enough to benefit health. Related to this aspect is when any benefits will be able to be detected. Many health indicators require long periods to become

evident (lagging indicators, such as cardiovascular health) while others can be considered leading indicators (exposure to heavy biomechanical loads).

3) **Potential Benefit**: This could be either quantitative or qualitative in nature, or both, and the organization should be encouraged to assign an appropriate weighting of the two. Quantitative benefits could include the number of employees who will benefit by the intervention. Qualitative benefits could include improvements in the subjective ratings by employees of the health promotion climate of the organization. According to the website for the NIOSH WorkLife Initiative (http://www.cdc.gov/workplacehealthpromotion/businesscase/index.html):

For individuals, workplace health programs have the potential to impact an employee's health, such as their health behaviors; health risks for disease, and current health status. For organizations, workplace health programs have the potential to impact areas such as health care costs, absenteeism, productivity, recruitement/retention, culture and employee morale. Employers, workers, their families and communities all benefit from the prevention of disease and injury and from sustained health.

4) **Return On Investment (ROI)**. It will be important to be able to answer the basic question of whether or not the intervention, once completed, will be worth the investment. Obviously, this is easy to address when the cost of an intervention is low but will harder to address when the cost of an intervention is high. This is another reason why initial interventions should not demand significant resources --- it will be easier to show a ROI. As an appreciation for the value of qualitative improvements grows over time, making a business case for more costly interventions should become easier.

The SC should be encouraged to bring in outside experts for help in reviewing projects proposed by the DT which are outside their scope of expertise.

11 Module 3: Interacting with the Design Team

To support the design process, the Steering Committee must be able to provide timely and constructive feedback to the DT. To this end, it will be useful to develop a timeline to provide constructive feedback and/or a decision on whether a proposed intervention will be supported, and to make every attempt to adhere to this timeline so that SC review is predictable from the standpoint of the DT.

Even with predictability, feedback which is delayed for long periods of time will undermine the design process. Furthermore, such delays can have a demoralizing effect on a DT, and will undermine program sustainability. When in some cases it becomes necessary for the SC to deliberate for a long period on a more challenging proposal, it will be important that the SC will at minimum regularly communicate to the DT the

status of this decision-making process (e.g., provide a status report about a proposal in time for the next DT meeting).

6. *Planning*

The Steering Committee should have the opportunity to plan how it will operate. For example, how many alternatives must the Design Team present? Develop Agenda for first meeting (?) Overall expectations ... frequency/duration of meetings ...

7. *Program Evaluation/Diagnostic Checklist*

The SC is ultimately responsible for the health of the program. Therefore it will be important for SC to periodically evaluate the overall program, its working relationship with the DT, and the effectiveness of the DT. Shortcomings in any of these areas can signal the need for additional training, and also guide program development. It may be fairly obvious to facilitator when are in need of change, and so a formal evaluation may not be necessary. A diagnostic checklist (TBD) used by the facilitator after every SC meeting can be used to track training needs.

Appendix 1

Co-chair Responsibilities

1. Work with site facilitator in planning upcoming meetings

2. Call meetings

3. Prepare and circulate agenda

4. As the program matures, assume leadership of meetings with limited assistance from facilitator.

5. Prepare meeting minutes for use within the organization.

6. Communicate with a member of the University Research Team regarding questions/problems

7. Promote the overall program and any interventions

8. Set up reliable communication among SC members

   a. Phone, email, etc.

Appendix 2

First Meeting Agenda

TBD

Appendix 3

Process Wheel
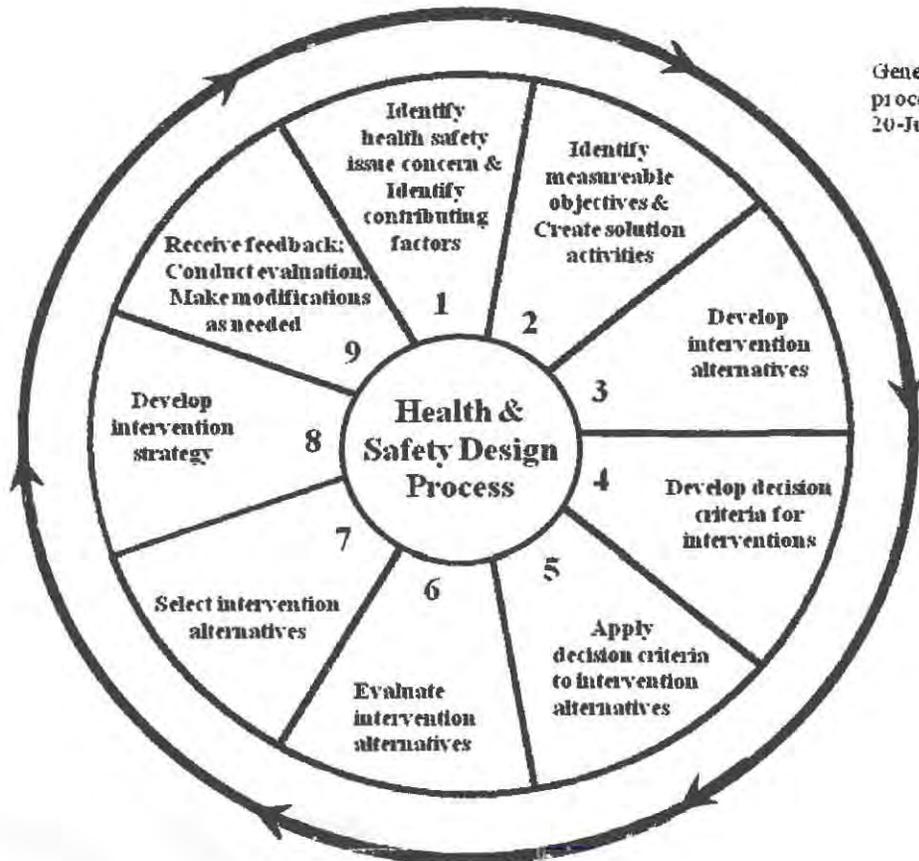
Generic BDS
process wheel
20-Jul-11

Appendix Four

Sample Agenda for Steering Committee Meetings

(To be developed)

Focus Group Guide for Workplace Health and Safety

Purpose: To gather a list of health and safety issues and concerns that will inform the Design Team about a range of health issues shared by workers. The findings will be used to help the Design Team begin to make plans for interventions.

Supplies needed: Flipchart paper and easel, markers, note paper and pens for participants.

Introduction (*5-10 min*):

Our first activity focuses on health and safety in the workplace. This activity is part of a employee health and safety improvement initiative, which is being spear-headed by _____ [name the appropriate individuals, departments, union representatives,etc as appropriate] This initiative will seek to uncover the important health or safety concerns of employees, and address them as comprehensively as possible. For some issues, this may require making some changes in how things are done at [company name] or possibly changing some physical aspects of the workplace. Programs to help people achieve a healthier lifestyle may also be offered to help employees achieve better health.

 For the success of the program, we need your help since you are the experts of this workplace. Today's activity will help me and others involved in the program to learn about your work environment and hear your opinions on what specific things about your job might be affecting your health in both good or bad ways. about it is also important to know how your work may affect the quality of your life outside of work.

This activity will last between one and one-half to two hours, and we have a prepared a set of questions. Sometimes I will ask you to expand or provide more detail to your answers to help me fully understand what you have to say. Please keep in mind that we have a limited amount of time together and that, as facilitator of this activity, I may need to redirect our

focus at times. If you have any additional comments or concerns, please note that this activity is only one of several steps to help get this health and safety improvement project going. In the next few months, there will be paper surveys where you will be given an opportunity to raise health and safety concerns of a more personal or private nature.

Your participation in today is voluntary, and you may withdraw at any time. You may also choose not to participate in specific parts of the discussion if it makes you feel uncomfortable. I will do my best to keep what you say confidential, but we also need your cooperation. Please respect each other's privacy and do not share anything discussed today with others.

Are there any questions before we begin?
Thank you all. Let's begin.

Focus Group Questions:
I would like to start off by focusing on the workplace environment and specific aspects of how the organization works and how change is handled. Later on, I will ask you what you think an ideal workplace at [company name] would be like.

I. Culture and Communication: Let's begin by discussing a few general aspects of culture and communications related to workplace health and safety in your organization.
1. How do employees participate in decision-making in your agency/organization?

2. How do employees know about decisions that get made?

3. If any one of you suggested a change in the workplace at [company name], what would happen next?

Probes used to stimulate discussion, if needed:
- How does a worker go about making a suggestion?
- How are employees encouraged to make suggestions for workplace change?

- What happens after someone makes a suggestion? Does anyone in the organization respond to your suggestions?
- How long does it usually take to see a change being made in response to your suggestions?

II. Work and Health: We've talked for a while about how change happens in this organization. Now we will talk more specifically about the workplace and health. In this portion of the discussion we'll discuss how you think your job affects your health, (in both positive and negative directions) and about any general health concerns you might share in common with your fellow workers.

4. (*15 min*) First, what aspects of work at [company name] seem to HELP you or your co-workers engage in healthy activities, or just staying healthy, while you are at work?

   Probes used to stimulate discussion, if needed:
   - Current wellness or safety programs that are helpful?
   - Other helpful aspects about the physical environment or company policies that promote health?
   - Qualities of the job that make you feel good? Keep you fit?
   - How do the relationships at work contribute to health, if at all?

5. Now I would like to hear your thoughts about which aspects of your work or workplace environment get in the way of being healthy. Are there things about your work tasks or the way work is organized that you feel make it difficult for you to take care of your health or to stay healthy?

   Probes used to stimulate discussion, if needed:
   - Are exposures to temperature, noise, heavy lifting, chemicals or other hazards a concern?
   - Is job stress a concern? What contributes to that? How does this affect your ability to take care of your health?

- What aspects of work seem to prevent you from engaging in healthy activities <u>outside</u> of the workplace?
- How concerned are you about your health after retirement?
- How concerned do you think [company name] is about job safety and ergonomics? About worker health?
- How is [company name] as far as …
  i. work scheduling flexibility, such as balance between home and work
  ii. any communication about health or safety

6. How concerned do you think [company name] is about job safety and ergonomics? About worker health?

   Probes used to stimulate discussion, if needed:
   - Policies that convey concern or lack of concern?
   - Programs and training opportunities (or lack of them?)
   - What ways, if any, do company communications show concern?

Wrap-up and Preparation for Part III:

Thank you very much for your time and thoughtful input to our discussion today. Is there anything else you would like to say that relates to health and/or safety on the job that has not yet been discussed?

[Pause to allow time to think and respond.]

If there are no other new topics to cover, I would like to take a few moments to summarize some of the main points we've discussed today. Please feel free to clarify your thoughts if I say something that is not quite right. [*Use the flip chart to review the main points*]

Now that we have explored various aspects of how the workplace influences health on and off the job, we will be reflecting on our discussion to think creatively about "the ideal workplace."

Next, we will talk about what you envision as the "ideal" workplace. This will (hopefully) be a fun activity in which we will begin to imagine what our workplaces could look like and feel

like if it was a place that made it easy to be and feel healthy. How would it be different from what it is now?

Part III. The Ideal Workplace

1. Imagine everything was ideal here as far as your workplace being safe and your job helping you stay healthy.

> What would the workplace be like?
> How would it be different from now?

2. Thinking back to what you said at our first focus group about how things work at this organization, and about what changes would make this an "ideal" healthy workplace, what steps are needed to get to that point?

Closing (5 *min*):

- Review the next steps of the program; role of Design Team, next Design Team meeting and Steering Committee role.
- Give participants an opportunity to ask questions.
- Facilitator formally declares end of focus group and thanks those present for their participation.

NOTE: *Part III could be facilitated during a follow up Design Team session on the same or on a different day. It will require about 30-45 minutes for the discussion. This is optimal for allowing participants to think more about their own work situation and reflect on the discussion as they do the homework assignment. Alternatively, facilitators can structure a longer meeting (2-3 hours including a break) to complete Parts I and II in the morning, and Part III after the break. If a longer, all inclusive meeting or retreat is desired, it will be important to include a time to allow participants to work independently on the "homework" before opening up a discussion on the Ideal Workplace. The discussion should end by describing what will happen in the next meetings to advance the design process.]*

STEP BY STEP GUIDE: FOCUS GROUP

OVERVIEW

A focus group is an efficient method for gathering information from workers who are willing to share concerns, ideas and experiences about safety and health in a group setting. The opportunity to ask follow-up questions makes it possible for the person leading a focus group to probe more deeply into specific issues. The main reason to conduct at least one focus group is to gather a list of health and safety issues and concerns that will inform the Design Team about a range of health issues shared by workers. Once a list of issues and concerns is generated, then the Design Team can decide where to begin in terms of planning a workplace intervention. Thus, the focus group findings are used to jump-start the Design Team's plans for interventions.

The results of the focus group (usually in combination with results of the All-Employee Health and Work Environment Survey) are also shared with the Steering Committee. Lastly, the list of focus group themes can guide you, as the program facilitator, in regard to planning the types of training the design team might need in order to be in a better position to design and develop workplace interventions that address the issues and concerns that have been raised.

HOW TO PLAN AND RUN A FOCUS GROUP

You need to recruit 6-10 participants for a focus group. Focus groups are not appropriate venues for solving problems or for training and education. Focus group sessions usually last about 1 ½ to 2 hours—long enough to allow in-depth discussion, but short enough to avoid mental fatigue.

STEP 1: Identify the focus group participants

Decide which employees you will potentially reach with new workplace health programs, and make sure these groups are represented in your focus group. If your Design Team will serve as the focus group, you should apply the same criteria when selecting the members of that group. You may be interested in making improvements for all employees or only a specific subgroup of employees. If yours is a fairly large organization, you may want to consider doing more than one group to help assure that you capture opinions of a wide range of employees.

Tips for selecting participants:
- Group participants together who have similar types of jobs, but who are not necessarily familiar with each other. Host separate focus groups for senior level managers, supervisors, and front line workers.
- Avoid grouping supervisors and front line workers together. Front line workers may not feel free to speak openly about their views if "the boss" is in the room.
- Aim for a range of ages and seniority—veteran employees and newcomers.
- Get suggestions from management and other leaders about specific employees who might represent different points of view and who would raise and discuss issues constructively.

You can ask for suggestions for focus group participants during the Key Personnel Interviews.

STEP 2: Customize the questions to suit the needs of the organization

Involve your organization's wellness champion, Steering Committee, or other key employee health leaders when preparing the focus group questions. First explain the main purpose of the focus group and then invite the person or group to review the *Focus Group Guide for Workplace Health and Safety* in the CPH-NEW Toolkit and to suggest any changes that would improve its effectiveness. Point out that the *Focus Group Guide for Workplace Health and Safety* has been used effectively in the past but that it is usually necessary to tailor it to each specific workplace. Ask whether the terminology used in questions is appropriate, if the questions touch on sensitive issues that would result in an unproductive meeting, or if certain topics or terms should be added to make the discussion more relevant.

If you will be designing new questions to replace the questions provided, be sure to limit the total number of question topic areas to 5 or 6, and order the questions in a way that begins with simple questions and leads progressively to more sensitive or complex questions. The reference list at the end of this guide provides resources on designing focus group questions.

STEP 3: Plan the logistics

Select a location that is private, comfortable, and easily accessible for participants. If there are windows, be sure there are shades or blinds that can be lowered for privacy. If possible, select a room with adequate controls for lighting, temperature, and noise so these do not become a source of distraction.

Select a time during the workday that is convenient. For some worksites, lunch time may be best. For workplaces with multiple shifts, try to offer opportunities for all shifts to attend. This may mean straddling the shift change times and paying additional wages to one or two workers to come an hour early or leave an hour late. Or it may point to the need to conduct multiple focus groups to avoid excluding any group of workers.

Offer refreshments appropriate for the time of day—full lunch or snack/beverage.

Obtain supplies needed to facilitate the group and for note taking. At a minimum, you will need a flip chart (adhesive-backed paper is preferable), markers (non-volatile to avoid odor sensitivity), note paper and writing implements for each participant. Using a tape recorder is not recommended unless the focus group facilitator is experienced in qualitative research methodology and has been trained in techniques for protecting the privacy rights of the

participants. Instead, assign a neutral person (preferably not an internal employee) to record notes on the flip chart for all to see during the focus group.

STEP 4: Recruit participants

Invite prospective participants 2-3 weeks in advance of the focus group session. Send the request in writing (letter or email) so that the participant understands the purpose of the focus group, what will be discussed, and the date and time. TIP: Invite 2 more people than your upper limit in case some decline or drop out or there are last-minute scheduling problems — there will always be no-shows. Sample focus recruitment materials are attached at the end of this guide.

Confirm attendance by phone or email to decide whether or not more participants are needed.

Send a reminder to participants about the focus group 2-3 days in advance. Tell participants what time to arrive, location/directions, food, etc. TIP: Make the reminder festive and light hearted. Pitch the group as a break from the routine, a chance to say what's important to their health, to be part of something big.

STEP 5: Facilitate the focus group

The facilitator's role for setting the tone for the focus group discussion is very important. In addition to following the tips below, be sure to arrive early to set up the room with materials, refreshments and signage so that participants feel welcome when they arrive.

DO
- Introduce yourself and the purpose of the focus group. Explain to participants that they have been invited to share their opinions about their work and their health, that you will ask the group to reflect on specific questions, and the group discussion will conclude at (TIME).
- Explain the **ground rules** for the focus group discussion: these are outlined in the *Focus Group Guide for Workplace Health*:
  o Participation in the focus group is voluntary
  o Information will be treated as confidential; individual responses will NOT be identified in summary materials or shared with management
  o Speak as openly as you feel comfortable
  o Avoid revealing personal health information
  o Help protect others' privacy by not discussing details with co-workers
  o Understand that others may not refrain from sharing information outside of the group
  o It's alright to abstain from discussing specific topics if you are not comfortable
  o All responses are valid—there are no right or wrong answers
- Allow time for participants to ask questions, then ask participants to introduce themselves.
- Open the session with a fun, non-threatening, open-ended question; this will enable everyone to develop a comfort level with speaking in front of the group and sharing their ideas.

- Pay attention to non-verbal signals – someone might be sending a cue that she/he is uncomfortable or might have something to say.
- Ask open ended questions, one at a time. Probe when a response is unclear. Ask "Can you say more about…"instead of "Why do you think…" (The latter may make someone feel they need to defend their point of view.)
- Balance the participation by asking, "Who else has something to say?" and "I would like to hear more from ____."
- End the discussion on a positive/constructive note, thank the group for their participation, and remind participants not to disclose specifics of the discussion for privacy reasons.

DON'T
- Read the script questions verbatim; this may come across too stiff and formal
- Finish people's sentences or make assumptions about what is being said by someone
- Permit side discussion
- Take sides – remain impartial
- Share your own opinions (verbally or non-verbally)
- Favor one participant over the others
- Use jargon or technical terms

STEP 6: Summarize the main themes

A few minutes before the session ends, refer back to the flip charts to summarize the main themes of the discussion. Ask participants to reflect on how you've described the main themes and ask if there are any additional points they feel should be clarified and noted. If there is time, ask the participants to try to prioritize the themes that emerged, and ask them to rank order the concerns starting with the one most in need of attention. Thank the group, provide your contact information for follow up if desired, and let them know who they can contact in their organization regarding future worksite health program planning.

After the session, write a summary of the responses to the questions discussed using the flip charts to help with the details. It may also be beneficial for the note taker to write a separate summary which can then be compared with the facilitator's and discussed as needed to reconcile any discrepancies.

Prepare a brief report to be used by the Design Team, Steering Committee, and employee health committee and or company leaders as they define future program planning goals. Be sure to include the following items in your report:
   o Purpose of the focus group
   o Generic description of participants (Note: be as general as possible to avoid revealing information that will make it easy to deduce who was in the group.)
   o Questions discussed (provide the *Focus Group Guide for Workplace Health and Safety* as an attachment to the report)
   o Highlights of main themes discussed

- o Quotes (optional—don't include if it would be easy to trace what was said back to a participant)
- o Implications for future health protection and health promotion programs.

References
http://www.westberks.gov.uk/media/pdf/2/h/How_to_Run_a_Focus_Group.pdf
http://www.unf.edu/dept/fie/sdfs/research/focus_groups.pdf
http://www.managementhelp.org/evaluatn/focusgrp.htm

The Focus Group Guidebook, David L. Morgan, Sage Publications, Inc., 1997
http://www.sagepub.com/booksProdDesc.nav?contribId=501912&prodId=Book6651

Sample focus group invitation

Dear ,

(COMPANY NAME) will be starting a new workplace health improvement initiative that will build on our current (WELLNESS/SAFETY) programs. A key feature of this new initiative is to actively engage employees in identifying health concerns and developing strategies that address both the work environment and individual health and lifestyle.

As part of the process to engage employees, (PARTNER ORGANIZATION) will conduct focus groups with front line employees to hear your views on health and work. You have been identified as an important contributor in these focus groups. While we hope you accept this invitation, the decision is yours to make. Please be assured there will be no penalty if you choose not to participate.

Focus groups will take place on (DATE, TIME) during work hours. The discussion will last approximately 90 minutes and will be confidential. Discussion topics will include certain aspects of health and safety in our organization, including workplace climate and culture, physical and ergonomic hazards, and work processes and social aspects of the job that may contribute positively or negatively to health.

Please reply to (NAME) to confirm whether you are willing to participate. If you choose to participate (NAME or, if appropriate, PARTNER ORGANIZATION) will contact you directly with a follow up confirmation.

Thank you in advance for considering this important opportunity.

Sample focus group flyer

(COMPANY NAME) Front Line Employees and Individual Contributors

JOIN US for a Health and Safety Focus Group

WHO 8-10 Front Line Employees and Individual Contributors employed by (COMPANY)
2 University of MA Lowell researchers specializing in workplace health promotion and ergonomics

WHAT 90 minute discussion about your work and your health. Discussion will be <u>private and confidential</u>.

WHEN (DATE, TIME)

WHERE (LOCATION)

WHY (COMPANY) is starting a new healthy work program for its employees
We need to know what topics and issues the new program should address

COMPANY has started a new health initiative for its employees to make their healthier.

A team of front line employees and individual contributors will be formed in the coming months to lead this program. The team will identify aspects of their work that could be improved with the goal of better health and wellness on and off the job.

(COMPANY) is partnering with the University of Massachusetts Lowell to develop this program. University personnel will conduct the focus groups and help set up the employee team to lead the program. (COMPANY) management will not be present.

Focus group discussions will create a starting list of topics for the new work team.

Your participation is <u>important.</u> Please consider volunteering.

Questions? Contact NAME

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in the New England Workplace

CPH-NEW
Center for the Promotion of Health
in the New England Workplace

Please answer all of the questions to the best of your ability.
Remember that all survey responses will be kept **completely confidential.**

For each question, please either fill in the blank or shade the circle that matches your response like this:

Shade circles like this ●   **Not** like this: ✗ ✓

If you change your mind about a response, please mark an X through the wrong answer(s).

Today's date: ☐☐ / ☐☐ / ☐☐☐☐

YOUR HEALTH

1. In general, would you say your health is:

○ Excellent   ○ Very good   ○ Good   ○ Fair   ○ Poor

2. The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?	Yes, limited a lot	Yes, limited a little	No, not limited at all
a) Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports	○	○	○
b) Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	○	○	○
c) Climbing several flights of stairs	○	○	○

3. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a) Accomplished less than you would like	○	○	○	○	○
b) Were limited in the kind of work or other activities you could do	○	○	○	○	○

4. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a) Accomplished less than you would like	○	○	○	○	○
b) Did work or other activities less carefully than usual	○	○	○	○	○

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5. During the past 4 weeks, how much did pain interfere with your normal work, (including both work outside the home and housework)?

	Not at all	A little bit	Moderately	Quite a bit	Extremely
	O	O	O	O	O

6. These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling.
How much of the time during the past 4 weeks...

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a) have you felt calm and peaceful?	O	O	O	O	O
b) did you have a lot of energy?	O	O	O	O	O
c) have you felt downhearted and depressed?	O	O	O	O	O

7. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting friends, relatives, etc.)?

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
	O	O	O	O	O

8. During the past 3 months, to what extent have you had pain, aching, numbness, or tingling in any of these body areas?

	Not at all	A little bit	Moderate	Quite a bit	Extreme
a) Hand or wrist	O	O	O	O	O
b) Shoulder, Neck, or Upper Back	O	O	O	O	O
c) Low back	O	O	O	O	O
d) Knee	O	O	O	O	O
e) Foot	O	O	O	O	O

9. During the past week, to what extent have you had difficulty sleeping because of any physical or emotional problem?

	Not at all	A little bit	Moderate	Quite a bit	Extreme
	O	O	O	O	O

10. During the work week, about how many hours of sleep do you typically get per 24 hour period?

	Less than 7 hours	7 hours - less than 8 hours	8 hours - less than 9 hours	9 hours - less than 10 hours	More than 10 hours
	O	O	O	O	O

11. How many hours of sleep do you usually need to have good functioning the next day?	Less than 7 hours	7 hours - less than 8 hours	8 hours - less than 9 hours	9 hours - less than 10 hours	At least 10 hours
	O	O	O	O	O

12. How would you describe the quality of your sleep on a typical night?	Can't say	Poor	Fairly poor	Fairly good	Good
	O	O	O	O	O

13. Please indicate how ready you are to make changes or improvements in your health in the following areas.	Not interested in changing	Interested in changing	Currently doing this to my satisfaction
a) Be physically active	O	O	O
b) Practice good eating habits	O	O	O
c) Avoid smoking or using tobacco	O	O	O
d) Lose weight or maintain healthy weight	O	O	O
e) Reduce the amount of stress in your daily life	O	O	O
f) Get a full night's sleep every night	O	O	O
g) Avoid alcohol or drink in moderation	O	O	O
h) Live an overall healthy lifestyle	O	O	O

YOUR WORK

14. For the following questions, please think about your work on your current main job. Assume that your work ability at its best has a value of 10 points.
(0 = you cannot work at all, 10 = your work ability is currently at its best)

	Cannot work										Best
	0	1	2	3	4	5	6	7	8	9	10
a) How many points would you give your current ability to work?	O	O	O	O	O	O	O	O	O	O	O
b) Thinking about the physical demands of your job, how do you rate your current ability to meet those demands?	O	O	O	O	O	O	O	O	O	O	O

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	0 Cannot work	1	2	3	4	5	6	7	8	9	10 Best
c) Thinking about the mental demands of your job, how do you rate your current ability to meet those demands?	O	O	O	O	O	O	O	O	O	O	O
d) Thinking about the interpersonal demands of your job, how do you rate your current ability to meet those demands?	O	O	O	O	O	O	O	O	O	O	O

15. The following questions ask about your experiences at your place of work. At my organization...	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
a) Employees are involved in improving quality products, services, and work processes.	O	O	O	O	O
b) New practices and ways of doing business are encouraged.	O	O	O	O	O
c) You would be taken seriously if you complained about disrespectful treatment.	O	O	O	O	O
d) Respectful treatment is the norm in your unit/work group.	O	O	O	O	O
e) All employee concerns are heard before job decisions are made.	O	O	O	O	O
f) Job decisions are applied consistently across all affected employees.	O	O	O	O	O
g) At my workplace, sometimes we talk with each other about improving our health and preventing disease.	O	O	O	O	O
h) Most employees here are very health conscious.	O	O	O	O	O
i) Supervisors always enforce health-related rules (smoking policies, requirements about medical examinations, etc.).	O	O	O	O	O

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16. How often do...	Never	Occasionally	Sometimes	Often	Most of the time
a) things going on at work make you feel tense and irritable at home?	O	O	O	O	O
b) things going on at home make you feel tense and irritable on the job?	O	O	O	O	O
c) you work mandatory overtime?	O	O	O	O	O

17. Please indicate how frequently you...	Never	Occasionally	Sometimes	Often	Most of the time
a) see a solution to problems and difficulties others find hopeless.	O	O	O	O	O
b) find that what happens to you in your daily life is difficult to understand.	O	O	O	O	O
c) see your daily life as a source of personal satisfaction.	O	O	O	O	O

18. Please indicate how often you have felt this way during the past week.	Rarely or none of the time (less than 1 day per week)	Some or a little of the time (1-2 days per week)	Occasionally or a moderate amount of the time (3-4 day per week)	All of the time (5-7 days per week)
a) I had trouble keeping my mind on what I was doing	O	O	O	O
b) I felt depressed	O	O	O	O

19. In general, I think my job is...		No	Not Sure	Yes
a) pressured		O	O	O
b) hassled		O	O	O

20. To what extent do you agree or disagree with the following statements about your work?	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
a) More and more often I talk about my work in a negative way.	O	O	O	O	O

(question 20 continued)	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
b) At work, I often feel emotionally drained.	O	O	O	O	O
c) All in all, I am satisfied with my job.	O	O	O	O	O
d) Overall I would recommend working with this organization to my family and friends.	O	O	O	O	O
e) I often think about quitting my job.	O	O	O	O	O
f) I will probably look for a new job during the next year.	O	O	O	O	O
g) My job duties often interfere with my ability to comply with safety regulations.	O	O	O	O	O
h) Taking risks is part of my job.	O	O	O	O	O

21. For each statement fill in the box for the answer that best describes your current job.	Strongly disagree	Disagree	Agree	Strongly Agree
a) My job requires that I learn new things.	O	O	O	O
b) My job requires me to be creative.	O	O	O	O
c) My job allows me to make a lot of decisions on my own.	O	O	O	O
d) On my job, I have very little freedom to decide how I do my work.	O	O	O	O
e) I get to do a variety of different things on my job.	O	O	O	O
f) I have a lot of say about what happens on my job.	O	O	O	O
g) I have a lot of say about my work schedule.	O	O	O	O
h) My job requires working very fast.	O	O	O	O
i) My job requires working very hard.	O	O	O	O
j) I am not asked to do an excessive amount of work.	O	O	O	O

(21 continued) For each statement fill in the box for the answer that best describes your current job.	Strongly disagree	Disagree	Agree	Strongly Agree
k) I have enough time to get the job done.	O	O	O	O
l) My job security is good.	O	O	O	O
m) My supervisor pays attention to what I am saying.	O	O	O	O
n) My supervisor is helpful in getting the job done.	O	O	O	O
o) People I work with take a personal interest in me.	O	O	O	O
p) People I work with are helpful in getting the job done.	O	O	O	O
q) My supervisor understands and supports my family and other personal responsibilities.	O	O	O	O
r) I am free from conflicting demands that others make.	O	O	O	O
s) My supervisor is concerned about the welfare of those under him/her.	O	O	O	O
t) In this facility, management considers workplace health and safety to be important.	O	O	O	O
u) I am often required to move or lift very heavy loads on my job.	O	O	O	O
v) My work requires rapid and continuous physical activity.	O	O	O	O
w) I am often required to work for long periods with my body in physically awkward positions.	O	O	O	O
x) I am required to work for long periods with my head or arms in physically awkward positions.	O	O	O	O
y) My job is emotionally demanding.	O	O	O	O
z) My job requires a high level of skill.	O	O	O	O
aa) I am concerned about my personal safety on this job.	O	O	O	O

22. What is your age? (fill in the blank) ☐☐

23. What is your gender?   O Male   O Female

24. What is your racial background? (Mark all that apply)

O White, European Descent

O Black, African American, African

O American Indian, Alaska Native

O Asian, Asian American; includes Filipino, Korean, Chinese, Pacific Islander, etc.

O Other - please specify _____

25. Do you consider yourself Latino or of Hispanic origin or descent?

O Yes: includes Puerto Rican, Cuban, Mexican, Central or South American

O No, not Latino/Hispanic

26. Please indicate the highest grade or year of school that you have completed.

O Less than high school diploma

O High school graduate or GED

O Some college

O College degree (2 or 4 year college)

O Graduate degree

27. What is your current marital status?

O Married or live with partner   O Widowed   O Divorced or separated   O Single, never married

28. Which range best describes your total family income (combination of salaries, wages, investments, and rents)?

O $10,000-24,999

O $25,000-49,999

O $50,000-74,999

O $75,000-99,999

O More than $1000,000

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29. How many years have you worked at this organization? ☐☐

30. How many hours do you typically work each week? (fill in the blank) ☐☐

31. What shift do you usually work?

- ○ First Shift (day)
- ○ Second Shift (evening)
- ○ Third Shift (night)
- ○ Rotating or other

32. What is your level of supervisory responsibility?

- ○ No supervisory responsibility
- ○ Supervisor
- ○ Manager
- ○ Executive

The next questions are about your health and its relationship to work and non-work. Please write your thoughts in the boxes, below.

Text A: If you think there is something about your job or workplace that has a bad effect on your health,

a) what is it about your <u>job or workplace</u> that is partially to blame?

b) what is the <u>bad effect</u> on your health?

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Text B: If you think there is something about your job or workplace that has a good effect on your health,

a) what is it about your job or workplace that deserves credit?

b) what is the good effect on your health?

Text C: If you think there is something outside your workplace that has a bad effect on your health,

a) what outside your job or workplace is partially to blame?

b) what is the bad effect on your health?

Text D: **If you think there is something outside your workplace that has a good effect on your health,**

a) what outside your <u>job or workplace</u> deserves credit?

b) what is the <u>good effect</u> on your health?

Text E: **Thinking ahead two or three years, what would you consider to be an important improvement in your health compared to now? (For example: feeling more energetic, being able to participate in sports/exercise activities, having more restful sleep or fewer illnesses, etc.)**

This is the end of this questionnaire.
Thank you very much for your time and assistance with this study.

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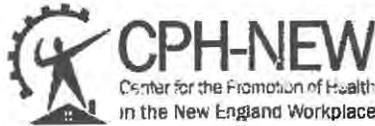
STEP BY STEP GUIDE TO ALL-EMPLOYEE SURVEY ADMINISTRATION

BACKGROUND

1. Concept: this survey is designed for ease of development and administration by the practitioner(s), Steering Committee, and Design Team as a tool to quickly assess major areas of concern for organizations.   Items in the core survey instrument have been selected through extensive validation efforts. The rationale for inclusion of each question group is contained in **APPENDIX I.**

   The items in the survey fall into 6 categories:
   1) Health outcomes. These are aspects of physical and mental health that may be affected by workplace characteristics (as well as non-work) and may help to direct attention to workplace characteristics that could be changed: items 1-12, 14, and 18
   2) Burnout, satisfaction and turnover intention. These are affected by workplace characteristics and can have a substantial impact on productivity and product quality: items 20a-f
   3) Workplace characteristics. These are physical, psychosocial, and organizational characteristics that may contribute, positively or negatively, to the outcomes in 1) and 2), above: Items 15, 16, 19, 20g-h, and 21
   4) Personal characteristics that may affect these relationships and may, in turn, be affected by workplace characteristics: items 13 and 17
   5) Basic demographic information that may affect these relationships
   6) Free text questions that invite survey participants to share more detail about their health and work. These answers add to information from focus groups and interviews and can provide focus and direction to intervention efforts.

2. Goals of the survey:
   a. For the **organization**:
      1) Gather data useful to the organization in improving the work environment, employee health, and productivity
      2) Demonstrate management commitment to improving employee health
      3) Serve as a generator of discussion, in the Steering Committee, Design Team and the body of employees, in the process of developing more effective, participatory interventions
   b. For the **Design Team**:
      1) Gather data useful in identifying problem areas in the workplace and designing interventions to address these problems
      2) Use follow-up data from employees to assess effectiveness of interventions, change/improve interventions, and identify next steps towards sustainability
   c. For the **researcher/practitioner**
      1) Gather pre/post data to help Design Team and assess effectiveness of toolkit
      2) Prepare for hand-off to internal organizational entities at close of project

1. Determine **survey content**
   a. Supply Steering Committee with the All-Employee Survey and Employee Survey Rationale
   b. Emphasize that the Survey has been designed to be a streamlined representative of much longer surveys, that many measures are strongly correlated with physical examination results in other studies, and that a substantial amount of labor has gone into analyzing past results to create a short, useful instrument. Emphasize that any additions risk reduction in response rate.
   c. Assure the Steering Committee that the survey results will be shared within the organization, and not with external audiences (e.g. OSHA inspectors, or parent company). The Steering Committee and Design Team will assist with designing how and to whom the results will be communicated within the organization.
   d. Steering Committee input into survey design
      1) Ask the Steering Committee to identify items that are of most importance to them and that are clearly understandable in the local context. The value of the items must be understandable to the Steering Committee. I.e., each question must clearly assess information that the Committee sees as important
         a) The "Rationale" document helps guide this discussion
      2) Agree on elimination of items that do not pass this stage. The decision to eliminate should clearly address why the reason for elimination is more important than the rationale for inclusion.
      3) Steering Committee proposes new, locally-relevant items that assess important employee attitudes or information. Criteria for these items:
         a) Clearly understandable by and meaningful to employees who will fill out the survey
         b) Protection of employee anonymity; items should not be included that only are applicable to a small (and identifiable) group of employees. A useful rule of thumb: do not collect data applicable to groups that are smaller than 10 employees
         c) Actionable. Items should generate information that could help identify a need for intervention and focus that intervention
         d) Parsimony. The survey length should not be appreciably increased
      4) The tool kit also contains a Supplemental Module—a contingency pool of items that have been validated by the researchers in previous work, or by other researchers. These can be provided to the Steering Committee when discussions identify the need to assess areas not included in the core survey
   e. Revised survey, the core with deletions and additions, is circulated to and discussed with the Steering Committee
   f. Discussions work out remaining issues: wording, placement within the survey, flow of the survey.

2. Determine **survey logistics**

a. Date, time and location of survey. Researchers are currently working on two additions to the survey: a web-based version and an Excel-based scoring sheet.
b. Survey protocol: whether surveys will be filled out in a room, sent home and collected later, or another method. Determine a return/collection method if survey is not filled out on-site. Also determine whether an incentive will be offered and how.
c. Determination of eligible employees (all full and part time, unless the Steering Committee wants to focus on a particular department or area for intervention)
d. Make arrangements for survey administration in another language and/or to employees with low literacy, if necessary. This may require translation and verbal administration.
e. Make arrangements for survey collection from employees that work off-shifts, weekends, or in remote locations, if researchers cannot be available. This may necessitate providing mail back envelopes and stamps.

3. Determine **publicity & outreach**
   a. Decide on/develop appropriate publicity materials
   b. Identify a range of different media and approaches to reach and recruit employees from different areas and levels within the organization. This generally involves several of the following:
      1) Email
      2) Posters
      3) LCD screens, if used
      4) Personal contact by steering committee members
      5) Mailings
   c. Steering committee identifies sends out invitations and instructions for taking the survey to eligible employees.

4. Determine type and intensity of data feed-back and communication that would be most useful (use the feedback template to focus discussion)
   a. Information fed back to Steering Committee and Design Team
   b. Information fed back to employees

STEP 2. ADMINISTRATION

1. Initial Contact with employees gathered to take the survey. Main points:
   a. Introduce yourself, your position on the project, and the purpose of the survey.
   b. Introduce the survey. Emphasize that it is completely anonymous. No names are taken, and the survey content does not include any personal identifiers.
   c. Emphasize that any analyses of the data by groups will not be performed or reported for groups of less than 10 employees
   d. Explain that results will be given back to the Steering Committee, Design Team and employees in aggregated form, with mean values for groups and number of responses in each response

category. No individual results are ever shared. It may be useful to show several slides from the feedback template, to show how average values are reported.

e. Emphasize that participation is voluntary, and that a participant can withdraw at any time.

f. If relevant, point out to the employee that they will be paid an incentive when they turn back their completed survey. If they wish not to answer certain questions, they will still be paid for their participation.

2. Hand out surveys. Answer any questions during the process.

a. Ask if any employee needs a survey form in another language, and provide if requested. Offer to interpret the survey for any worker who might appreciate the assistance.

3. Collect completed surveys, and store for analysis

a. As surveys are turned in, survey administrator will look over the survey to be sure that pages were not inadvertently missed and answer any questions that participants may have.

4. *Incentives (if offered)*

a. *Details of incentives to be worked out with the Steering Committee before survey administration*

b. *If the survey is not administered on site (e.g., remote locations, off shift and weekend employees, or electronic administration), explain the procedure for turning in the survey and collecting the incentive.*

STEP 3. ANALYSIS

1. Completed surveys are returned to the tool kit developers at UMass Lowell

a. First step: compilation of free text results, for quick feedback to the organization

b. **University** personnel then scan surveys, create and clean databases, and perform basic analyses needed for feedback.

c. **Note:** An Excel version of survey score creation and feedback graph creation is under development. Contact UMass Lowell for details.

2. Almost all analyses are simply generation of item and scale frequencies (i.e., number of respondents in each response category of an item) that are requested by the Steering Committee. These may also include cross-tabs to stratify by different areas or demographic groups, if appropriate

a. CAUTION: respondent anonymity requires that no results be generated or presented for a group that has fewer than 10 respondents. For example, if an area has 50 employees, of which 9 are male, the researchers or practitioners should NOT present data broken down by gender

b. In certain situations, organizations may request correlations between different domains. These should be approached with caution, because they can be misleading unless controlled for confounders, using partial correlation or regression techniques. It is recommended that analyses be frequencies and cross-tabs, unless an important reason for more sophisticated modeling is presented. Remember, the purpose of the survey is to create data upon which the Design Team and Steering Committee can base interventions, not to produce detailed research results.

STEP 4. COMMUNICATION AND FEED-BACK

1. Remember: results will be shared with the worksite in aggregate, with no individual results available to employees, the Design Team, the Steering Committee, or management.

2. First feedback to the organization: combined focus group results and free text items from the survey and prepare a summary document. This is a crucial first look at employee reports. Create a document that summarizes the major themes, to serve as a basis for a broad brush look at the organization, barriers to and facilitators of employee health, and potential areas of concern.

3. Two forms of feedback are recommended, depending on the wishes of the Steering Committee and Design Team. These are not mutually exclusive.
   a. Create a simple document that contains tables of response frequencies for each individual item. Scales (combinations of 2 or more items) require a mean score report
   b. Frequencies and cross-tab results are used to generate graphs in Excel, either by UMass personnel or the practitioners. Substitute these graphs for the dummy graphs in the PowerPoint Feedback template, creating detailed notes for the slides that will be shown (as determined with the Steering Committee and Design Team). Flag areas of particular concern or areas that deviate substantially from norms. Include all major data domains for Steering Committee discussion and inclusion/exclusion decisions.

4. Present to Steering Committee. Use these discussions to determine:
   a. Data of most importance, for general presentation
   b. Best data presentation to Design Team and general employee population. Which items are difficult to understand, not actionable, or present a potential compromise of anonymity? [This is a back-up check; all data points that represent fewer than 10 employees should be folded up to a higher level in the analytic steps, above.]
   c. Potential next steps and foci of interventions, from the point of view of the Steering Committee.
   d. Congruence with focus group and free text survey results. In most cases, the survey results should provide more detail to help quantify the qualitative results. If there is non-congruence, delve more deeply into this discrepancy. This may require additional interviews or focus groups.

5. Present to Design Team.
   a. Use these data to focus discussions on selection of intervention foci and potential intervention strategies.
   b. After interventions, a follow-up survey administration will provide data useful to evaluate intervention effectiveness or barriers to success, allowing changes to the approach to improve effectiveness, and laying the groundwork for dissemination to other areas or departments and establishing a sustainable, self-correcting program

Measure	What is Measured	Source
SF-12 (Items 1-7)	Various aspects of physical and mental health (general health perceptions, physical functioning, role limitations due to physical or emotional problems, bodily pain, social functioning, and mental health).	Ware, J.E., Kosinski, M., Turner-Bowker, D.M., Gandek, B. SF-12v2™: How to Score Version 2 of the SF-12® Health Survey. Lincoln, RI: QualityMetric Incorporated, 2002.
Physical Symptoms (Item 8)	Symptoms such as pain, aching, numbness, and tingling in the upper and lower extremities, back, and joints. Indicates the possibility of injury or loss of function.	Generated for this survey
Sleep Items (Items 9-12)	Aspects of a person's sleep, including quality of sleep, actual amount of nightly sleep, amount of nightly sleep required for good functioning, and sleep disturbance due to physical and emotional problems.	Generated for this survey with help of Richard Stevens
Readiness to Change (Item 13)	Employees' interest in adopting various healthy lifestyle practices (i.e., physical exercise, healthy diet, weight loss, stress management, elimination/reduction of alcohol and tobacco use).	*(From a CPH-NEW survey) The original were 'confidence in ability to change', changed to 'readiness to change' with the 3-point response scale, developed internally* -Prochaska, J., DiClemente, C., & Norcross, J. (1992). In search of how people change: applications to addictive behaviors. American Psychologist, 1102-1114. -Prochaska, J. & Velicer, W. (1997). The Transtheoretical Model of health behavior change. American Journal of Health Promotion, 12, 38-48. -Prochaska, J. (2007). The transtheoretical model applied to the community and the workplace. Journal of Health Psychology, 12(1), 198-200.
Work Ability (Item 14)	Employees' current ability to meet the demands of their jobs with respect to the physical, mental, and interpersonal resources they feel they have available.	Ilmarinen, J., Tuomi, K., Eskelinen, L., Nygard, C. H. et al. (1991). Background and objectives of the Finnish research project on aging workers in municipal occupations. Scandinavian Journal of Work, Environment and Health. 17 (Suppl 1), 7-11. Note: Last work ability item (concerned with ability to carry out interpersonal demands of work) is not part of the WAI. It was developed for

		the International Healthcare Professionals Survey and the Survey of Work and Time. Source: J. Barnes-Farrell
		Item wording has been modified for a U.S. sample; wording is consistent with the items as they are being presented in the Health and Retirement Survey (Institute for Social Research, University of Michigan).
Organizational Culture (Items 15a-b)	Assesses employee perceptions of their involvement in decision-making and the innovative ability of the organization.	Organizational Assessment Survey (OAS). Office of Performance Monitoring (OPM). http://www.opm.gov/employ/html/org_asse.asp.
Civility Norms (Items 15c-d)	The extent to which general rudeness (i.e., behavior that violates unspoken rules of mutual respect and courtesy, and displays a lack of regard for others) is tolerated in the workplace.	Walsh, B.M., Magley, V.J., Davies-Schrils, K.A., Marmet, M.D., Reeves, D.W., & Gallus, J.A. (2008, April). Developing and validating a brief measure of workplace civility norms. In J.A. Bunk (Chair), How Rude! Investigating the Complexity of Disrespectful Behaviors at Work. Symposium presented at the annual meeting of the Society for Industrial and Organizational Psychology, San Francisco, CA.
Procedural Justice (Items 15e-f)	Employee perceptions of the fairness of policies and procedures used to make organizational decisions.	Niehoff, B.P., & Moorman, R.H. (1993). Justice as a mediator of the relationship between methods of monitoring and organizational citizenship behavior. Academy of Management Journal, 36(3), 527-556.
Health Climate (Items 15g-i)	The extent to which the people in one's workplace are aware of, communicate about, and are supportive of healthy lifestyle practices.	Basen-Engquist K, Hudmon KS, Tripp M, Chamberlain R. (1998) Worksite Health and Safety Climate: Scale Development and Effects of a Health Promotion Intervention. Preventive Medicine 27, 111–119
Work-family Conflict (Items 16a-b)	The extent to which employees experience difficulty in balancing the simultaneous and conflicting demands of their work and family obligations (i.e., Does the stress of work spill over into one's home/family life? Does the stress of home/family life spill over into one's work?)	Kessler, R.C. National Comorbidity Survey: Baseline (NCS-1). ICPSR06093-V5. Ann Arbor, MI: ICPSR [distributor], 2008-07-01.
Sense of Coherence (Item 17)	The extent to which people view the world as comprehensible, manageable, and meaningful.	Lundberg, O., & Nyström Peck, M. (1995). A simplified way of measuring sense of coherence: Experiences from a population survey in Sweden. European Journal of Public Health, 5, 56–59.
Depression (Item 18)	Experiences of emotional difficulty that are specifically characterized by symptoms such	Radloff LS, The CES-D scale: A self-report depression scale for research in the general population. Applied Psychological Measurement,

	as low mood, lack of energy, loss of interest or pleasure, and poor concentration.	1, 1977, pp.385-401. Shortened version: Turvey, C.L., Wallace, R.B., & Herzog, R. (1999). A revised CES-D measure and depressive symptoms and a DSM-based measure of major depressive episodes in the elderly. International Psychogeriatric Association, 11(2), 139-148.
Work Stress (Item 19)	Whether workers experience their jobs as being psychologically pressured or threatening.	Stanton, J. M., Balzer, W. K., Smith, P. C., Parra, L. F., & Ironson, G. (2001). A general measure of work stress: The Stress in General scale. Educational and Psychological Measurement, 61, 866-888.
Burnout (Items 20a-b)	Feelings of overwork that are characterized by emotional exhaustion and disengagement.	Demerouti, E., Bakker, A. B., Nachreiner, F., & Shaufeli, W. B. (2000). The job demands-resources model of burnout. Journal of Applied Psychology, 86, 499-512.
Job Satisfaction (Items 20c-d)	Whether the feelings that workers have about their jobs and organizations are favorable.	OAS (above); some items developed for this survey
Intent to Turnover (Items 20e-f)	The desire that one has to quit one's job and find a new job with a different organization.	Balfour and Wechsler (1996) Organizational Commitment: Antecedents and Outcomes in Public Organizations. Public productivity & Management Review, 19, 256-277.
Work Safety Tension (Items 20g-h)	Whether workers perceive that working safely is incompatible with performing their job duties effectively.	Dedobbeleer, N., & Béland, F. (1991). A safety climate measure for construction sites. Journal of Safety Research, 22(2), 97-103. Mueller, L., DaSilva, N., Townsend, J., & Tetrick, L. (1999, April). An empirical evaluation of competing safety climate measurement models. Paper presented at the Annual Meeting of the Society for Industrial and Organizational Psychology, Atlanta, GA. Hofmann, D. A., & Stetzer, A. (1996). A cross-level investigation of factors influencing unsafe behaviors and accidents. Personnel Psychology, 49, 307-339.
Job Content Questionnaire (JCQ) (Item 21)	An overall psycho-social assessment of employees' work situation, including work demands, decision-making latitude, variety, control, social interaction with supervisors and coworkers, and perceptions of worker safety. These items identify risk factors for job stress.	Karasek, R. A., Pieper, C. F., & Schwartz, J.E. (1985). Job Content Questionnaire and User's Guide Revision 11. Developed at Columbia University. Information from Dr. Karasek, Dept. of Work Environment, UMass/Lowell, Lowell, MA **except items:** **g, q, t, y, aa**

Guiding the Healthy Workplace Project:
The Design Team Creation Tool

A key component of the CPH-NEW approach to improving workplace health and safety is to establish a framework that will promote active participation and engagement of line-level employees in 1) the identification of health and safety concerns, and 2) in the development and implementation of workplace interventions to address these concerns. This guide describes how the Steering Committee should go about the creation of a **Design Team** that is made up of line-level employees. The Design Team will be asked to collaborate with the Steering Committee on workplace interventions, as depicted in Diagram 1.

While it is possible that an organization may at some point want to establish multiple design teams to better address the health and safety concerns of other levels of their organization, it is recommended here to first establish a Design Team of line-level employees to address the health and safety issues/concerns of the largest portion of the organization's workforce. Even with only one design team active, the health and safety issues/concerns of other groups of employees can be addressed through initiatives of the Steering Committee. Workplace interventions that are initiated by the Steering Committee will benefit from a consultation process with the Design Team. This will also help maintain and promote a collaborative working relationship between the Steering Committee and the Design Team, as depicted in Diagram 1.

This guide describes in some detail how the Steering Committee should go about identifying and recruiting members of a Design Team. Workplaces vary in size, type of work activities, levels of management, demographics and skills of employees, and so forth, and so some of the approaches recommended here may need to be adapted accordingly. The Healthy Workplace Program has built-in process evaluations and feedback mechanisms that can be used to correct or fine tune the functions and make-up of the Steering Committee and Design Team, and therefore is expected to be self correcting over the long term.

The flowchart on page 2 will help in guide the creation of the Design Team:

Establish DT Creation Procedure with SC
- Review organizational chart & make recommendations for line-level tasks
- Establish a reasonable timeline

Organizational Communication
- Convey plan to middle management/supervisors
- Circulate recruitment postings/brochures

Apply Selection Tool

Obtain Management Approvals
- Obtain Management Approvals
- release time

Send Invitations to Candidates

Announce New Design Team
- Include endorsement of high-authority individual
- Provide start-up timeline

1. *Identify the Pool of Line-level Employees*

Line-level employees typically represent the largest number of workers in an organization. Line-level employees typically do not function in supervisory or managerial capacities. The organizational chart can be consulted to help identify this pool of employees.

2. *Selection Criteria*

Members of a design team must be:
- Able to represent, as a group, the full array of line-level jobs and task environments.
- Able to represent, as a group, the demographics of line-level workers (ethnicity, age, seniority, union membership).
- Committed to health and safety and/or improving the workplace.
- Willing to work together with other team members.
- Open to learning new skills (e.g., team brainstorming, a combination of ergonomics & health promotion).
- Able to function as an opinion leader among their peers (respected for their ideas, able to muster coworker support for a project like this).
- Able to meet on a regular basis (pending approval from immediate supervisor).

3. *Set Target Number of Design Team (DT) Members*

Partially dependent on the number of line-level jobs and employee demographics, a DT will ideally have 6-8 members. In cases where regular attendance is not possible (e.g., rotating shifts), DT meetings should have a minimum of 4 members present at a meeting but forming a larger DT so that 6-8 members are present is more desirable. During the start-up period, all DT members should be present for training and group exercises.

4. *Co-Chairs and Facilitator Select Candidate DT Members for review by full Steering Committee*

The facilitator should meet with one or both Steering Committee Co-Chairs in order to make a list of **n** first choices, as well as a list of **n** alternatives. Line-level employees who earlier had participated in the focus group(s) are usually good candidates for a Design Team.

5. *Review candidate members and make final choices (full Steering Committee)*

Use of the **Selection Tool for DT Members** may be helpful in making the final choices (see Table 1).

6. *Obtain Necessary Approvals from Managers and Immediate Supervisors, as Needed.*

An informational meeting for managers and supervisors is recommended in order to inform and gain support for the program. This meeting can be co-chaired by the Co-Chairs of the Steering Committee.

7. *Circulate General Announcement*

A general announcement should be sent to each member of the organization. The announcement should include:
- The endorsement of a high-authority individual (upper management or the organizational owner) and union (where applicable).
- A general overview of what the DT does (see Appendix 1).
A notification that a subsequent invitation will be going out to the potential DT candidates.

8. *Send Out Invitations or Talk to Candidates*

Once the general announcement has been circulated, **invitations** can be sent out to your list of DT members. If individuals decide not to participate in the DT, send out invitations to your list of alternatives. Alternately, personal meetings with one or both Steering Committee Co-Chairs may be more effective at both showing interest in the candidate and in answering questions about the project.

Appendix 1

Design Team Roles, Goals, & Responsibilities

Overview

The Design Team serves as a front-line link between the health and safety problems employees experience on a day-to-day basis and potential solutions to these problems. Regular Design Team meetings provide a means for line-level employees to take an active role in designing workplace interventions to benefit health. Working closely with the Steering Committee and members of the CPH-NEW team, the Design Team helps identify employee concerns, generates proposed changes, and advocates for these changes to improve the work environment.

Members of the Design Team should be able to commit to regular participation in meetings, plus occasional tasks outside of meetings. Supervisor support for members' participation in team activities (release time, etc.) is important for success.

Commitment:

- Meeting schedule: bi-weekly 1 ½ hour meetings initially (monthly when program is up and running)

- November 2010 through Summer 2011

Goals:

- Improve employee health and participation in the workplace

- Strengthen communication between management and the workforce about health and safety concerns and methods for addressing them

- Select issues to be improved and suggest solutions for them

- Protect long term sustainability of the health improvement program

Table 1

Selection Criteria

Members of a design team must be:
- Able to represent, as a group, the full array of line-level jobs and task environments.
- Able to represent, as a group, the demographics of line-level workers (ethnicity, age, seniority, union membership).
- Committed to health and safety and/or improving the workplace.
- Willing to work together with other team members.
- Open to learning new skills (e.g., team brainstorming, a combination of ergonomics & health promotion).
- Able to function as an opinion leader among their peers (respected for their ideas, able to muster coworker support for a project like this).
- Able to meet on a regular basis (pending approval from immediate supervisor).

Diagram 1

Roles of Steering Committee (SC) & Design Team (DT)

Steering Committee
- Invites DT to develop and propose interventions
- Provides **resources and feedback** for proposals
- Develops or extends interventions to managers, supervisors, staff (with help from DT)
- Helps promote & evaluate all interventions

Action & feedback

Action & feedback

Design Team
- Identifies & prioritizes **employee** health issues
- Comes up with ideas for workplace interventions
- Proposes best intervention ideas to Steering Com
- Helps promote & evaluate all interventions
- Helps refine interventions, as needed

PExHP Program Tracking System Quick-Start Guides

DRAFT_5 February 2011

Megan Dove-Steinkamp

CPH-NEW

Table of Contents

The Tracking System allows users to systematically record and track activities associated with health promotion/protection through participatory ergonomics (PExHP).

NOTE: The database is currently available through a wiki site and is accessible by invitation only. If you need to request permission to access the wiki, please contact Sandy Sun at Sandy_Sun@uml.edu.

1. Open your web browser (i.e., Explorer, Firefox).
2. Go to http://www.wiki.uml.edu/t/c/7nVN8lmSnHCOViWFdldMz5. You will be directed to the login screen shown below.

3. Enter your complete email address in the Email field.
4. Enter your email password in the Password field.
5. Click **Submit**. You will be directed to the wiki homepage below. A navigation menu is displayed on the right.
6. Navigate to the Project D folder located on the left.

You will be directed to the Project D page, as shown below.
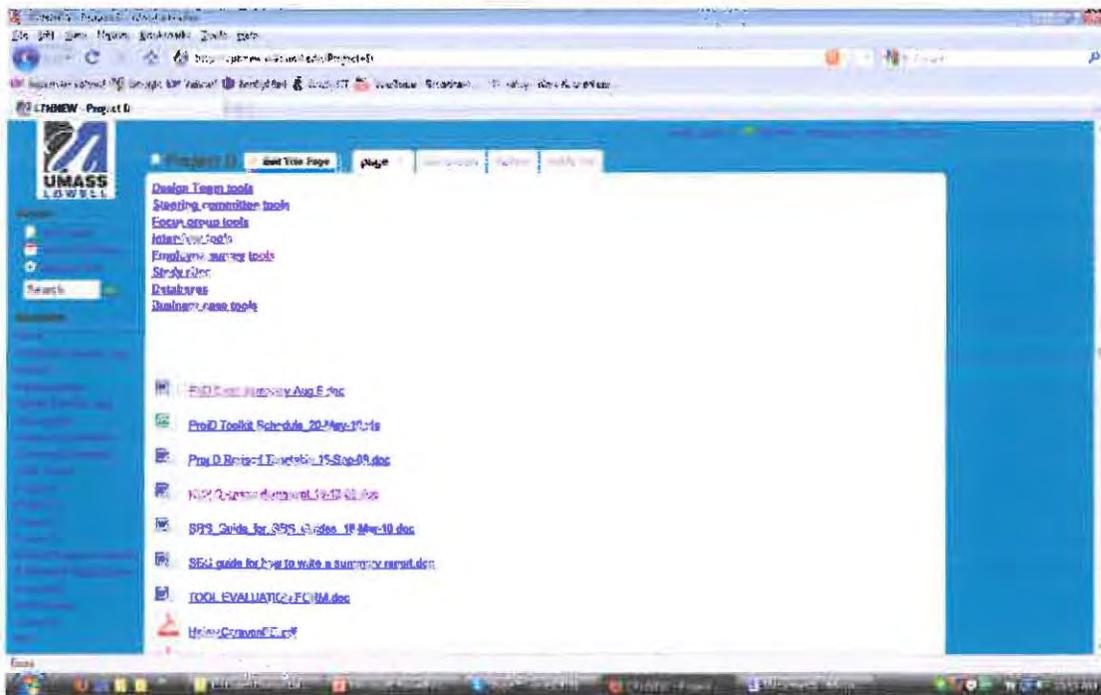
7. Click on the Databases hyperlink located in the upper left of the active window.

You will be directed to the Databases page, as shown below.
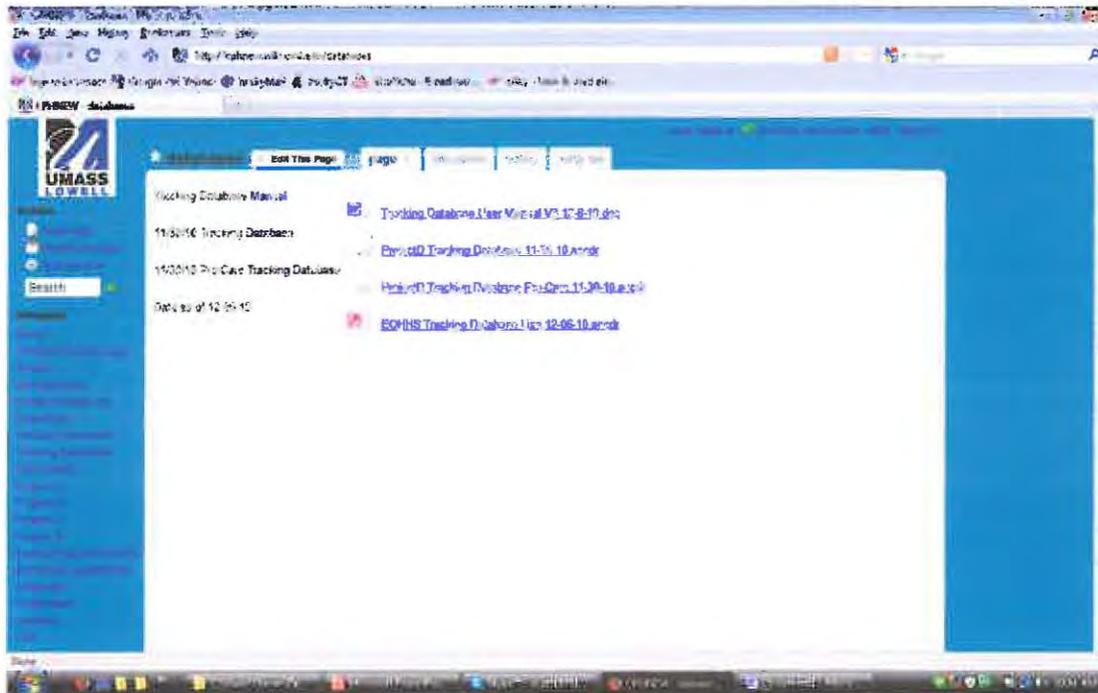
8. Select the most recent version of the Project D Tracking Database, as indicated by the most recent date.
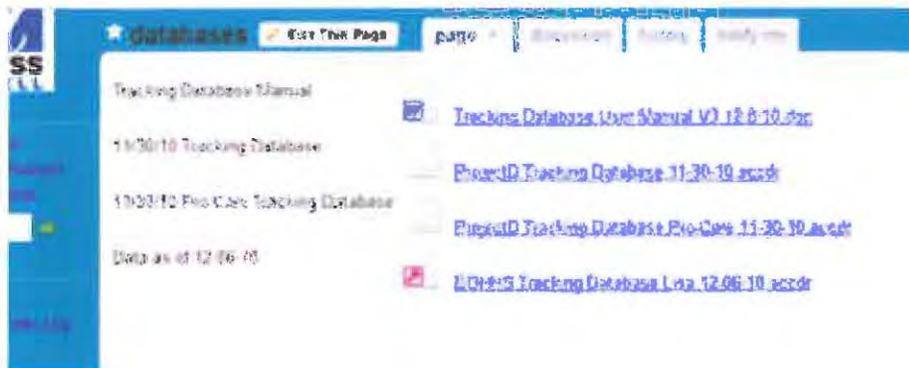
9. Click the hyperlink to download.

10. Save the database to your desktop. Be careful to <u>not</u> change the original filename.

11.The Tracking System icon ( ) and filename (e.g., ProjectD Tracking Database 11-30-10.accdr) should now appear on your desktop.

Congratulations! You have successfully installed the Database!

The Main Menu of the Tracking System presents the user with a choice of 12 action buttons, representing the primary features of the Tracking System. See the Tracking System User Manual for more specific details about each of the System's features.

1. Double-click the PExHP Tracking System icon ( ) on your desktop.

2.

If you receive a Security Notice, click Open.

You will be directed to the Main Menu as shown below.
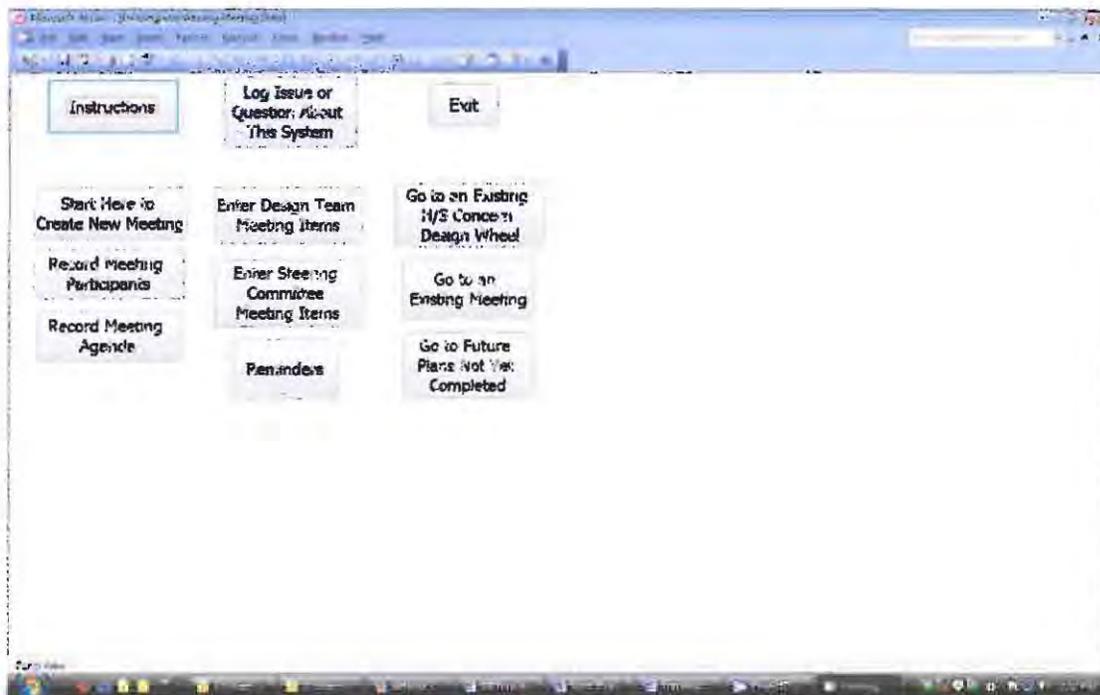
2. To navigate to a specific entry window, click the desired button (e.g., Instructions).

   Refer to the Table of Contents for additional information about each of the features found on the Main Menu.

3. To close the Tracking System, click the Exit button.

Congratulations! You have successfully accessed the Tracking System!

The Instructions button on the Main Menu will direct the user to a digital version of the Tracking System User Manual and Quick Start Guide (available to view as a .pdf files).

1. Click the Instructions button located on the Main Menu of the Tracking System.

2. Select the document of interest.
3. Click the in the upper right corner of the active window to return to the Main Menu.

Congratulations! You have successfully accessed the Tracking System User Manual!

The Log Issues or Questions About This System feature allows users an opportunity to enter information about system issues/questions so that they may be tracked over time and addressed in future versions. For immediate assistance, please email the system developer, Scott Ryan, at Scott.Ryan@uconn.edu.

1. Click the Log Issue or Question About This System button located on the Main Menu of the Tracking System.

Log Issue or
Question About
This System
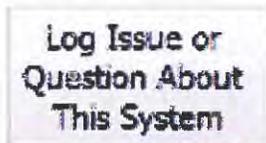
2. You will be directed to the screen shown below.
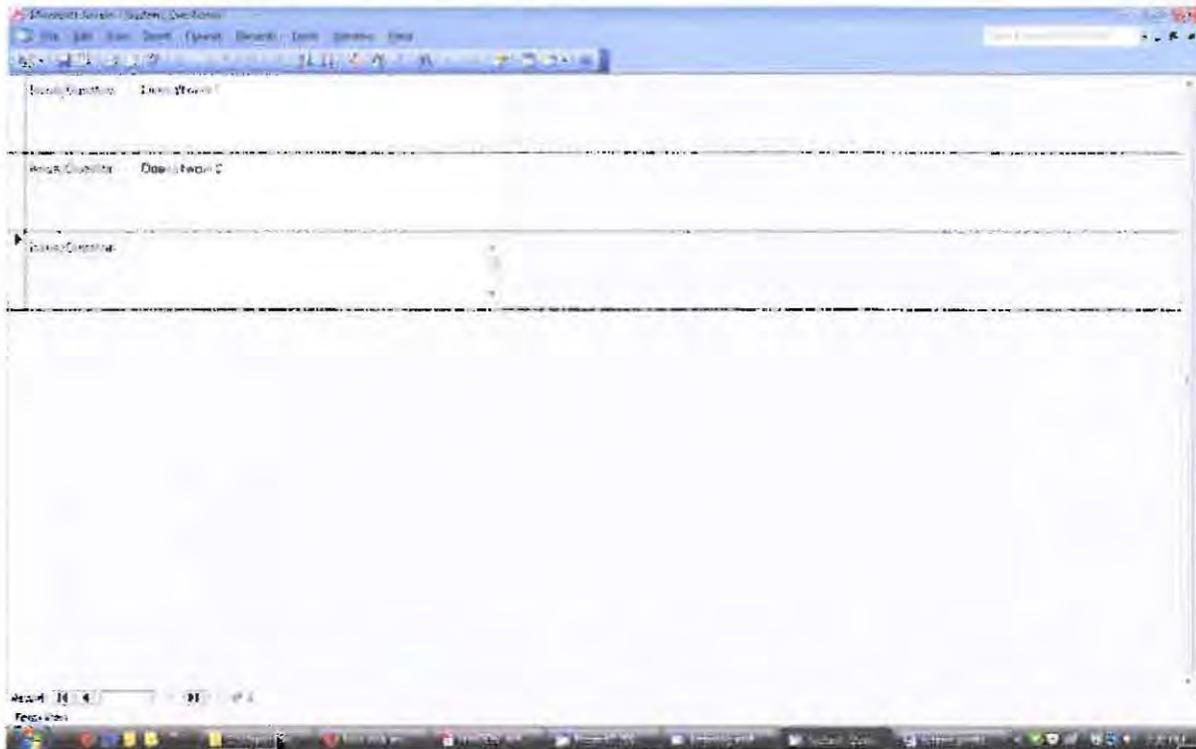
3. If there are existing entries, use your mouse or the Tab key on your keyboard to advance to the next available blank field.

A black arrow (▶) will appear in the left margin to indicate that a field is active.

Issue/Question

If you are searching for a particular entry, you may use the scroll feature located in the lower lefthand corner of the window to advance to the desired field.

Record: |◄| |◄| [3] |►| |►| of 3

Use the scrollbar ˙ located to the right of the text field to view text not immediately visible.

4. To log an issue/question, simply click inside the white text field and begin typing. Your input will automatically save to the database.

Issue/Question

Issues/questions that have been addressed will remain in the log, indicated by a check mark (✓).

5. Click the ▉ in the upper right corner of the active window to return to the Main Menu.

Congratulations! You have successfully logged an issue or question about this system!

The Start Here to Create a New Meeting button is intended as a log in for a single meeting. Information entered via this page will automatically populate all pages associated with this meeting.

1. Click the Start Here to Create New Meeting button located on the Main Menu of the Tracking System.

2. You will be directed to the screen shown below.
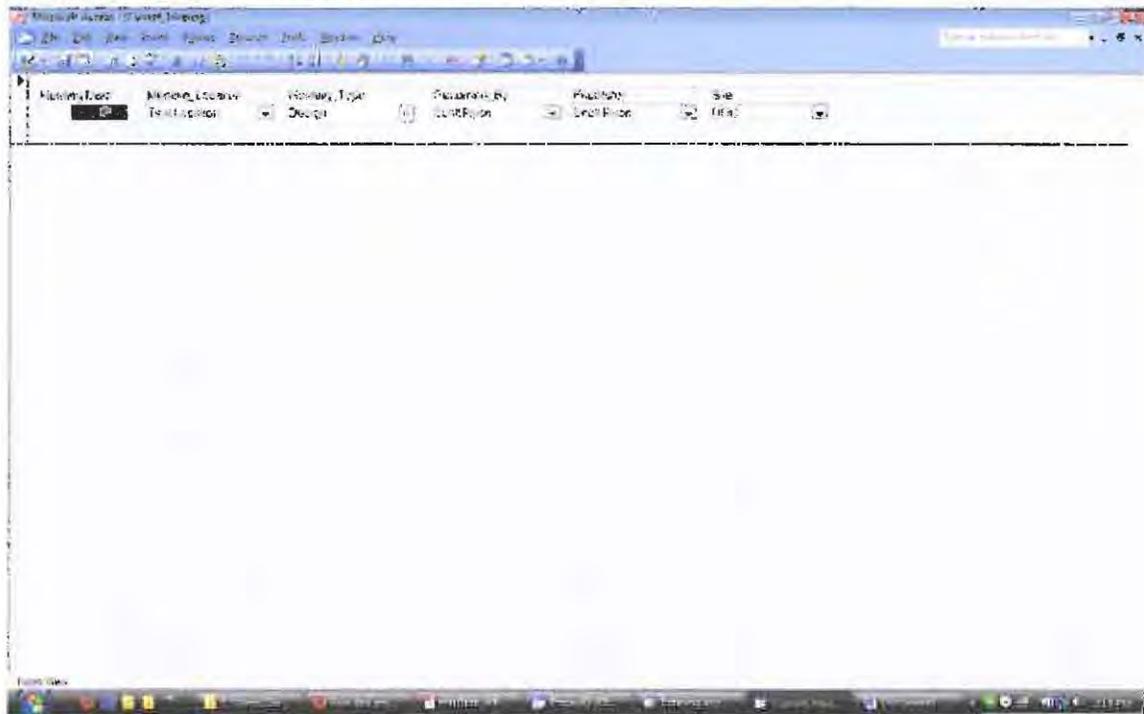
3. Use your mouse or the Tab key on your keyboard to advance to the field, Meeting Date.

4. Click on the calendar icon and select the appropriate date. You may click on the "Today" button to automatically fill in the current date. You may also manually enter the date the meeting occurred, using month-day-year format. Be sure to separate the day, month, and year by either a space, dash, or slash. Years may be entered as either two- or four-digits.

5. Use your mouse or the Tab key on your keyboard to advance to the field, Meeting Location.

Meeting_Location
Test Location

6. Click the arrow at the right to select the appropriate meeting location from the drop-down list. If the site where the meeting occurred is not listed on the drop-down menu, type it in.

7. Use your mouse or the Tab key on your keyboard to advance to the field, Meeting Type.

Meeting_Type
Design

8. Begin typing or use the arrow at the right to select the appropriate meeting type from the drop-down list.

9. Use your mouse or the Tab key on your keyboard to advance to the field, Recorded By.

Recorded_By
Scott Ryan

10. Begin typing your name or use the arrow at the right to select your name from the drop-down list.

11. Use your mouse or the Tab key on your keyboard to advance to the field, Facilitator.

Facilitator
Scott Ryan

12. Begin typing or use the arrow at the right to select the appropriate name from the drop-down list.

13. Use your mouse or the Tab key on your keyboard to advance to the field, Site.

Site
DOC

14. Begin typing or use the arrow at the right to select the appropriate site from the drop-down list.

15. Click the ▣ in the upper right corner of the active window to return to the Main Menu. Your input will be automatically saved.

Congratulations! You have successfully created a new meeting!

The *Record Meeting Participants* feature is intended to function as a log of individuals participating in a specific meeting.

1. Click the Record Meeting Participants button located on the Main Menu of the Tracking System.

   Record Meeting
   Participants

2. You will be directed to the screen shown below. The names of potential meeting participants will prepopulate fields under the heading Name. Names will be presented in alphabetical order.
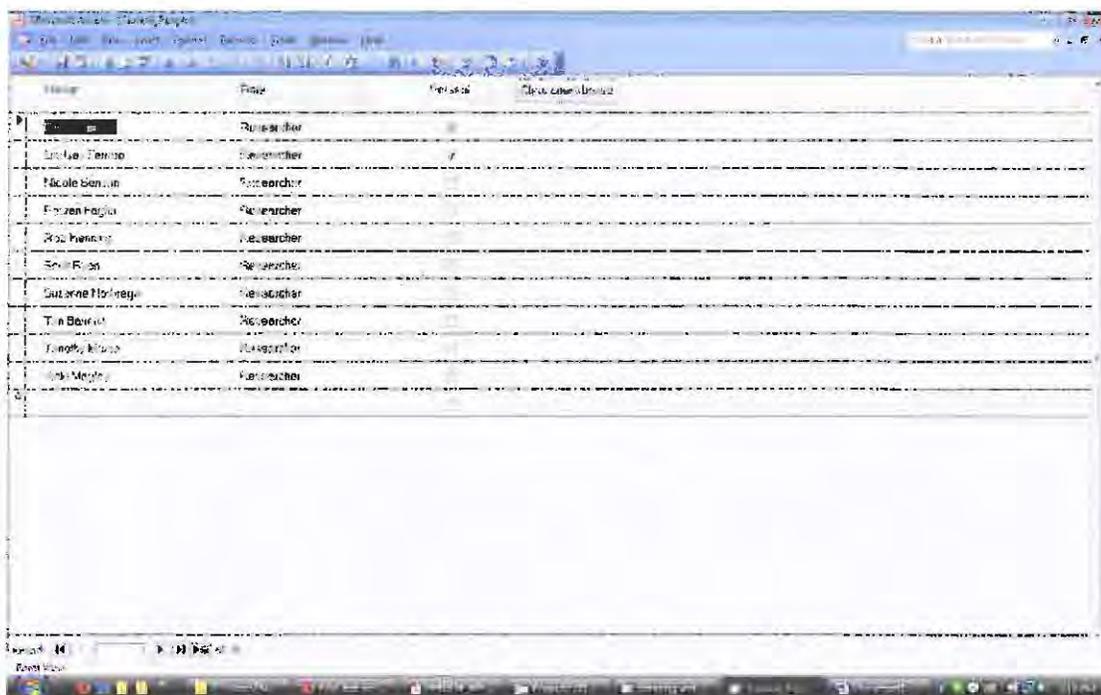
3. Use your mouse to click the Clear Checkboxes button.

   Clear checkboxes
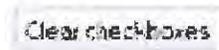
4. Find the name of an individual scheduled to attend the meeting in question.

13

Use the scroll feature located in the lower left corner to search for a particular individual.

Record: I◄ ◄   3 ► ►I   of 3

A black arrow (▶) will appear in the left margin to indicate that a field is active.

If you do not find the name of the person for whom you are searching, advance to the end of the list and type the individual's first and last names into the next available field.

5. Use the Tab key on your keyboard to advance to the field under the column, Role. Select or type in the role of the person whom you are adding.

Role

6. Use your mouse to place a check mark (✓) in the box located under the Present column.
7. Repeat steps 5 and 6 for each individual attending the meeting.
8. Click the [X] in the upper right corner of the active window to return to the Main Menu. Your input will be automatically saved.

Congratulations! You have successfully recorded the meeting participants!

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The Record Meeting Agenda feature provides the user an opportunity to formally list agenda items for an upcoming meeting.

1. Click the Record Meeting Agenda button located on the Main Menu of the Tracking System.
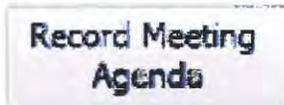
Record Meeting Agenda

2. You will be directed to the screen shown below. Information regarding meeting date, location and individuals recording/facilitating the meeting will appear automatically.
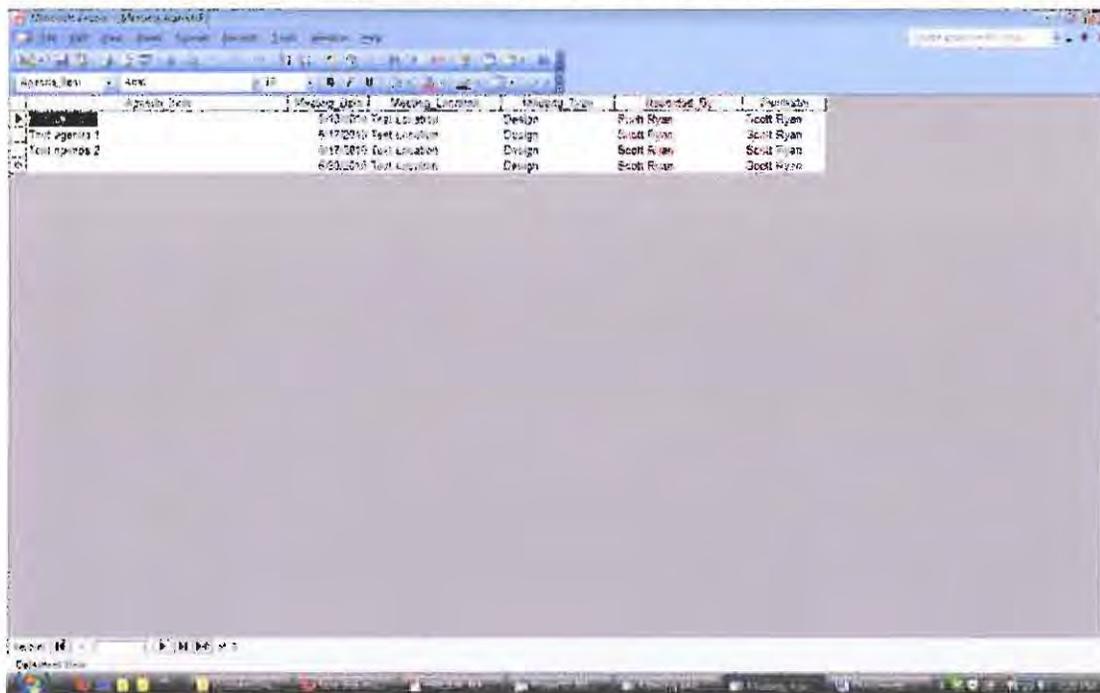
3. Use your mouse to click an open field under Agenda Item. Begin typing information about a single agenda item.

Use the scroll feature located in the lower left corner to search for a particular agenda item.

Record: 14 4 [3] ▶ ▶ of 3

A black arrow (▶) will appear in the left margin to indicate that a field is active.

Use the scrollbar ▾ located to the right of the text field to view text not immediately visible.

4. Repeat step 3 for each remaining agenda item.
5. Click the in the upper right corner of the active window to return to the Main Menu. Your input will be automatically saved.

Congratulations! You have successfully recorded the meeting agenda!

The *Enter Design Team Meeting Items* button on the *Main Menu* will direct the user to the page represented in the above figure. This page is intended to capture details about the Design Team's response with respect to a certain item of interest.

1. Click the Enter Steering Committee Meeting Items button located on the Main Menu of the Tracking System.

2. You will be directed to the screen shown below. Information regarding meeting date, location and individuals recording/facilitating the meeting will appear automatically.

NOTE: There are several windows to be filled up in this content. However, you may not fill all of them. Your decision will be based on how much work has been done with the Design Team to date. Leave items that are not applicable blank or enter "n/a". Each field is described below.

3. Item Name: This field allows you to create/select a meeting-related item.

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Use your mouse to activate the dropdown list of meeting agenda items. You may either use your mouse to select an existing item or begin typing to create a new item. Use brevity when creating new item identifiers; you will have the opportunity to describe an item in more detail in the Item Details field.

4. Item Details: This field allows you to describe an item in greater detail.

Use your mouse to activate this field. You may type information related to the item selected in step 4 directly into this field.

5. Concern: This field allows you to identify concerns associated with a specific item.

You may either use your mouse to select an existing concern or begin typing to create a new concern. To search for an existing concern, use your mouse to either activate the dropdown list or to use the scroll feature located in the lower left corner of the field. Use brevity when creating a new concern identifier.

NOTE: A single item may be associated with more than one concern. Additional fields will appear as you enter a new concern. Use the new blank fields to continue to enter all relevant concerns.

6. Identified By: This field allows you to specify who identified a concern (e.g., team or researchers).

Use your mouse to activate the dropdown list of options. Select the appropriate option.

7. Where in Wheel: This field allows you to specify where this item falls in the design process.

Use your mouse to activate the dropdown list of steps in the design process. Select the appropriate step (1-7) or Unknown.

8. Intervention: This field allows you to associate the item with a particular intervention.

Use your mouse to activate the dropdown list of options. Select the appropriate intervention.

9. Status: This field allows you to update the status of the item.

Use your mouse to activate the dropdown list of options. Select the appropriate status for this item.

10. Item Type: This field allows you to categorize the item.

Use your mouse to activate the dropdown list of options. Select the category that best characterizes the item.

11. Training Provided: This field allows you to describe any training provided with respect to this item.

Use your mouse to activate this field. Type a description of any relevant training that has been Provided with respect to this item.

12. Reflections: This field allows you the opportunity to add comments/questions pertaining to the meeting.

Use your mouse to activate this field. Type any comments/questions into the textbox.

13. Ratings: These fields allow you to provide ratings with respect to several dimensions, including team leadership, team responsibility, team engagement, active learning, program change, and management commitment.

Use your mouse to activate the dropdown list of rating options. Select the rating that best represents the Design Team.

14. Reasons: These fields allow you to provide reasons for your ratings.

Use your mouse to activate the appropriate rating reason field. Type your rationale for the assigned rating.

15. Outside Source: This field allows you to identify external source of information.

Use your mouse to activate this field. Type any relevant source-identifying information.

16. Challenges: These fields allow you to indicate any challenges faced and how they were overcome.

Use your mouse to activate the appropriate field. Type details about challenges and steps to overcome them (respectively).

17. Future Plans: These fields allow you to indicate future plans (and applicable due dates) with respect to the item.

Use your mouse to activate the field. Type respective details.

NOTE: A single item may be associated with more than one future plan. Additional fields will appear as you enter a new future plan. Use the new blank fields to continue to enter all relevant future plans.

18. Action: These fields allow you to keep track of actions that have been taken (and when) with respect to the item.

Use your mouse to activate the appropriate field. Type respective details.

19. Compete: This field allows you to indicate whether an action has been completed.

To indicate that an item has been completed, use your mouse to place a check mark ($\checkmark$) in the box under Complete.

20. Feedback: These fields allow you to keep track of feedback that has been received, including source of feedback, date delivered, and individual receiving the feedback.

Use your mouse to activate the appropriate field. Type respective details.

21. Click the asterisk (   ) on the scroll feature located in the lower left corner to advance to a new record.
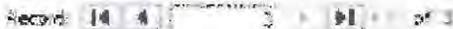
22. Repeat steps 3-21 (as applicable) for all relevant meeting items.

23. Click the [   ] in the upper right corner of the active window to return to the Main Menu. Your input will be automatically saved.

Congratulations! You have successfully recorded Design Team meeting items!

The *Enter Steering Committee Meeting Items* button on the *Main Menu* will direct the user to the page represented in the above figure. This page is intended to capture details about the Steering Committee's response with respect to a certain item of interest.

1. Click the Enter Steering Committee Meeting Items button located on the Main Menu of the Tracking System.
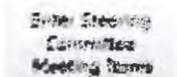
2. You will be directed to the screen shown below. Information regarding meeting date, location and individuals recording/facilitating the meeting will appear automatically.

NOTE: There are several windows to be filled up in this content. However, you may not fill all of them. Your decision will be based on how much work has been done with the Steering Commitee to date. Leave items that are not applicable blank or enter "n/a". Each field is described below.

3. Item Name: This field allows you to create/select a meeting-related item.

Use your mouse to activate the dropdown list of meeting agenda items. You may either use your mouse to select an existing item or begin typing to create a new item. Use brevity when creating new item identifiers; you will have the opportunity to describe an item in more detail in the Item Details field.

4. Item Details: This field allows you to describe an item in greater detail.

Use your mouse to activate this field. You may type information related to the item selected in step 4 directly into this field.

5. Concern: This field allows you to identify concerns associated with a specific item.

You may either use your mouse to select an existing concern or begin typing to create a new concern. To search for an existing concern, use your mouse to either activate the dropdown list or to use the scroll feature located in the lower left corner of the field. Use brevity when creating a new concern identifier.

NOTE: A single item may be associated with more than one concern. Additional fields will appear as you enter a new concern. Use the new blank fields to continue to enter all relevant concerns.

6. Identified By: This field allows you to specify who identified a concern (e.g., team or researchers).

Use your mouse to activate the dropdown list of options. Select the appropriate option.

7. Where in Wheel: This field allows you to specify where this item falls in the design process.

Use your mouse to activate the dropdown list of steps in the design process. Select the appropriate step (1-7) or Unknown.

8. Intervention: This field allows you to associate the item with a particular intervention.

Use your mouse to activate the dropdown list of options. Select the appropriate intervention.

9. Status: This field allows you to update the status of the item.

Use your mouse to activate the dropdown list of options. Select the appropriate status for this item.

10. Item Type: This field allows you to categorize the item.

Use your mouse to activate the dropdown list of options. Select the category that best characterizes the item.

11. Training Provided: This field allows you to describe any training provided with respect to this item.

Use your mouse to activate this field. Type a description of any relevant training that has been Provided with respect to this item.

12. Reflections: This field allows you the opportunity to add comments/questions pertaining to the meeting.

Use your mouse to activate this field. Type any comments/questions into the textbox.

13. Ratings: These fields allow you to provide ratings with respect to several dimensions, including team leadership, team responsibility, team engagement, active learning, program change, management commitment, item progress, communication frequency, and communication to senior management.
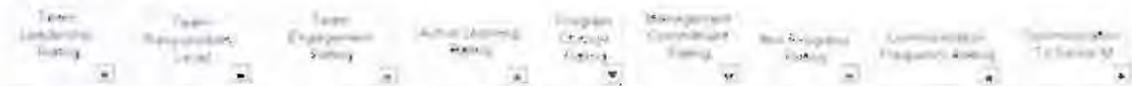
Use your mouse to activate the dropdown list of rating options. Select the rating that best represents the Steering Committee.

14. Reasons: These fields allow you to provide reasons for your ratings.

Use your mouse to activate the appropriate rating reason field. Type your rationale for the assigned rating.

15. Outside Source: This field allows you to identify external source of information.

Use your mouse to activate this field. Type any relevant source-identifying information.

16. Challenges: These fields allow you to indicate any challenges faced and how they were overcome.

Use your mouse to activate the appropriate field. Type details about challenges and steps to overcome them (respectively).

23

17. Future Plans: These fields allow you to indicate future plans (and applicable due dates) with respect to the item.

Use your mouse to activate the field. Type respective details.

NOTE: A single item may be associated with more than one future plan. Additional fields will appear as you enter a new future plan. Use the new blank fields to continue to enter all relevant future plans.

18. Action: These fields allow you to keep track of actions that have been taken (and when) with respect to the item.

Use your mouse to activate the appropriate field. Type respective details.

19. Compete: This field allows you to indicate whether an action has been completed.

To indicate that an item has been completed, use your mouse to place a check mark ($\checkmark$) in the box under Complete.

20. Feedback: These fields allow you to keep track of feedback that has been received, including source of feedback, date delivered, and individual receiving the feedback.

Use your mouse to activate the appropriate field. Type respective details.

21. Response Time: These fields allow you to track whether response times occur as planned.

Use your mouse to activate the appropriate field. Type the appropriate date.

22. Recommendations: These fields allow you to indicate recommendations for Design Team members.

Use your mouse to activate the appropriate field. Type respective details.

23. Resources Provided: This field allows you to indicate whether resources have been provided to address the item.

Use your mouse to activate the field. Type details.

24. Evaluation Measures: This field allows you to indicate plans to evaluate an item.

Use your mouse to activate the field. Type details.

25. Senior Management Approval: This field allows you to see whether senior management has approved proposed action/intervention/solution for this item.

Use your mouse to activate the dropdown list of options. Select the option that best represents the item's current approval status.

26. Click the asterisk (   ) on the scroll feature located in the lower left corner to advance to a new record.

27. Repeat steps 3-26 (as applicable) for all relevant meeting items.

28. Click the ▓▓ in the upper right corner of the active window to return to the Main Menu. Your input will be automatically saved.

Congratulations! You have successfully recorded Steering Committee meeting items!

The Go to an Existing H/S Concern Design Wheel feature has been designed to provide the user with a catalogue of all concerns that have been entered into the system to date. There is exactly one design process wheel for each concern in the list. Items are labeled according to how they were generated: "Design" for items generated by the design team, "Steering" for items generated by the steering committee, and "Reminders" for items entered into that page.

1. Click the Go to an Existing H/S Concern Design Wheel button located on the Main Menu of the Tracking System.

2. You will be directed to the screen shown below.
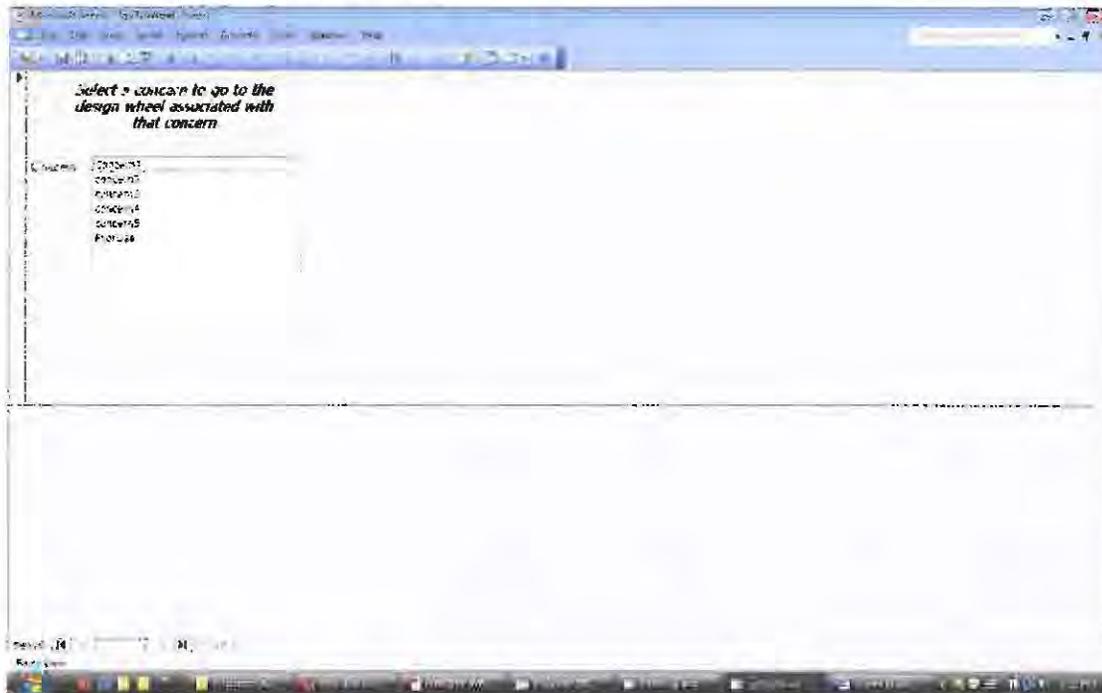
3. Use your mouse to click the concern of interest. You will be directed to the screen shown below.
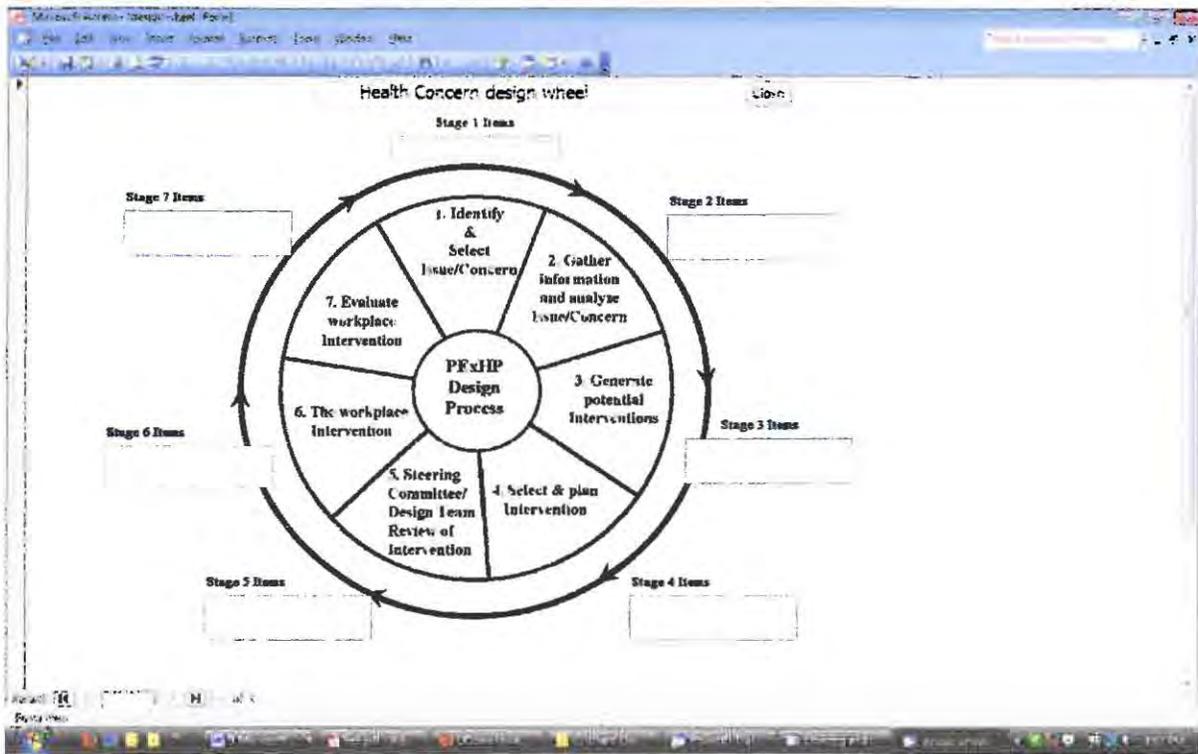
Use the Tab key on your keyboard to advance through fields associated with each of the 7 stages.

4. There are two ways to view item details.

    a. Use your mouse to click on a wedge. You will be directed to the Design Team items page.

    -- OR --

    b. Use your mouse to click on a specific item of interest. You will be directed to the page from which the item was originally created.

5. Click the in the upper right corner of the active window to return to the Main Menu. Your input will be automatically saved.

Congratulations! You have successfully viewed an existing design wheel!

The Go to an Existing Meeting feature presents the user with a list of all meetings entered into the Tracking System. Entries are arranged by date, whereby the first meeting entered appears at the top of the list and the last entry appears at the bottom.

1. Click the Go to an Existing Meeting button located on the Main Menu of the Tracking System.

2. You will be directed to the screen shown below.

3. Use your mouse to click the specific meeting of interest.

Use the scrollbar · located to the right of the text field to view text not immediately visible.

4. Click the in the upper right corner of the active window to return to the Main Menu. Your input will be automatically saved.

Congratulations! You have successfully viewed an existing meeting!

The Future Plans Not Yet Completed page presents the user with a list of all plans (not yet completed) entered into the Tracking System. Entries are arranged by due date, whereby the most time-urgent plan appears at the top of the list and the plan with the furthest due date appears at the bottom. Each plan is associated with a particular item.

1. Click the Go to Future Plans Not Yet Completed button located on the Main Menu of the Tracking System.
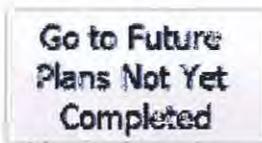
2. You will be directed to the screen shown below.
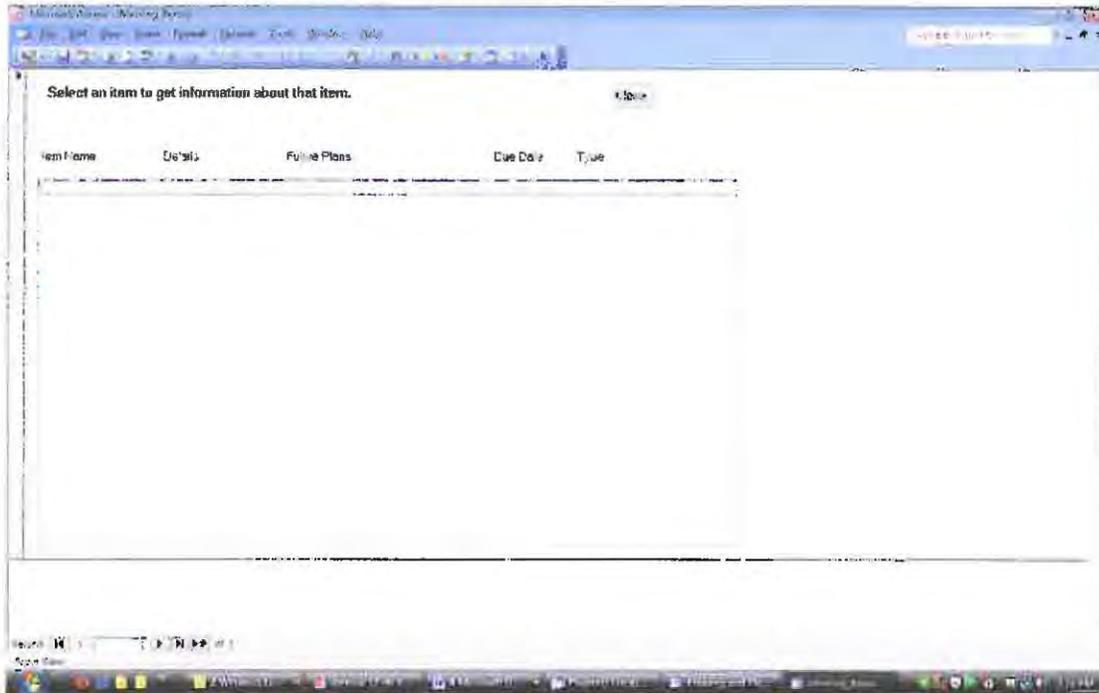
3. Use your mouse to click the specific plan of interest.

Use the scrollbar · located to the right of the text field to view text not immediately visible.

4. Click the in the upper right corner of the active window to return to the Main Menu. Your input will be automatically saved.

Congratulations! You have successfully viewed a future plan!

*The Reminders feature allows users to enter considerations and future plans with respect to **items that do not yet exist** (For items that already exist, users are encouraged to make use of the Future Plans fields available via the Design Team Meeting Items and Steering Committee Meeting Items pages). A reminder is created without an associated source; in other words, the reminder is not associated with either the design team or steering committee.*

1. Click the Reminders button located on the Main Menu of the Tracking System.

2. You will be directed to the screen shown below.
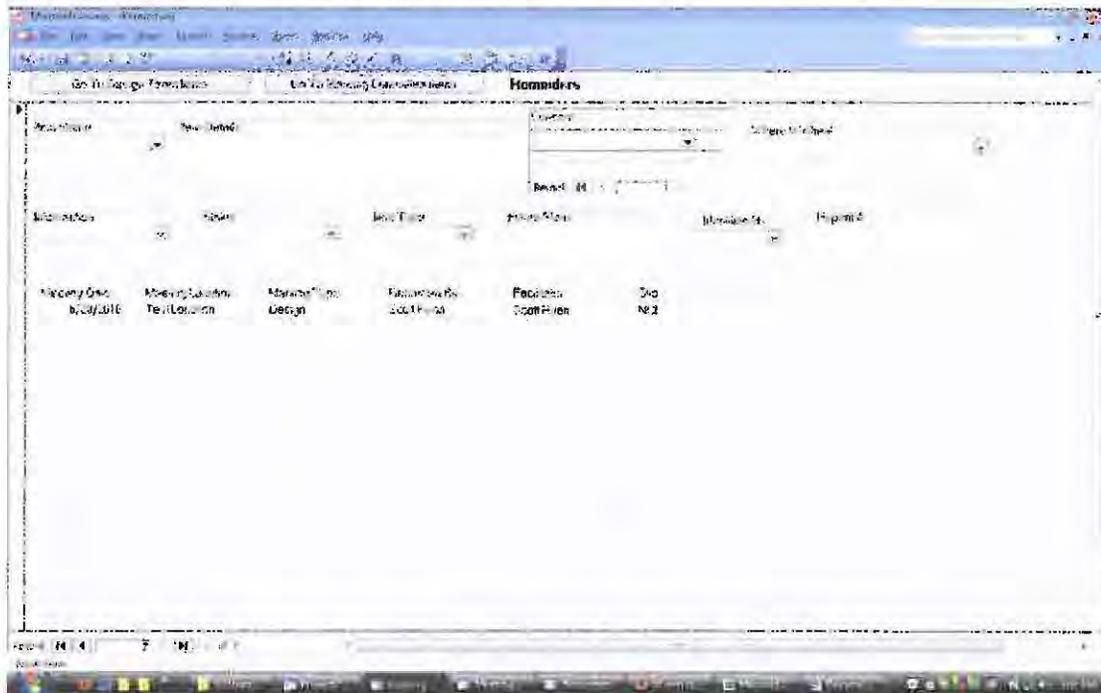
3. Use the scroll feature located in the lower lefthand corner to search for a particular reminder.

A black arrow (▶) will appear in the left margin to indicate that a field is active.

Use the scrollbar located to the right to view information not immediately visible.

4. Click the in the upper right corner of the active window to return to the Main Menu. Your input will be automatically saved.

Congratulations! You have successfully viewed a reminder!

Project D Scientific Presentations

Work, Stress and Health 2011, Orlando

Implementation and Testing of a Toolkit for a Participatory Health Promotion and Health Protection Intervention. *Reeves, D., Warren, N.*

The Business Case Decision Scorecard for Planning Workplace Health Promotion/Protection Interventions. *Robertson, M., Henning, R., Johnson, N., Dove-Steinkamp, M.*

A NIOSH WorkLife Project: Development and Validation of a Multi-Purpose Short Practitioner Survey. *Warren, N., & Dugan, A.*

Field Tests of the CPH-NEW Toolkit: A Grassroots Participatory Program for Workplace Health Promotion/Protection. *Norbrega, S., Erck, E., Henning, R., Warren, N., Robertson, M.*

Development of a Database Tracking System to Facilitate Distributed Communication of Worksite Health Promotion/Protection Activities. *Ryan, S., Henning, R. Dove-Steinkamp, M.*

Getting to Know You: Occupational Health Researchers Investigate Employee Assistance Professionals' Approaches to Workplace Stress

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Acknowledgements

Abstract

Workplace stress is strongly associated with health problems, including cardiovascular

disease. The occupational health field is developing partnerships with a variety of health

professions to prevent and address job stress at the organizational level. A review of

literature for and about employee assistance professionals was conducted to explore their

perspectives on these issues. Results show high awareness regarding the health effects of job

stress and a wide range of approaches to address this problem. EAPs appear to be a potential

strong partner in efforts to prevent workplace stress, but face obstacles to intervening at the

level of the work environment.

Keywords: Stress, organizational intervention, occupational health, cardiovascular disease,

dual client relationship, work environment

Literature Review-EAP approaches to workplace stress

Introduction

Work-related stress, work organization factors that lead to stress, and associated cardiovascular and other diseases are increasingly urgent topics in occupational health. Researchers in these areas from the Center for the Promotion of Health in the New England Workplace (CPH-NEW) recognize that employee assistance professionals (EAPs) are central actors in addressing employee stress, yet the EAP profession is largely unfamiliar to our field. In order to approach EAPs respectfully as potential partners in education and practice, we conducted a literature review to learn about this field's perspectives on job stress.

Background

The National Institute for Occupational Safety and Health (NIOSH) has placed "Work Organization and Stress-Related Disorders" among its main priorities (see NIOSH "Work Organization and Stress-Related Disorders,"

http://www.cdc.gov/niosh/programs/workorg/). NIOSH explains "Job stress results when there is a poor match between job demands and the capabilities, resources, or needs of workers…. Job stress is also associated with various biological reactions that may lead ultimately to compromised health, such as cardiovascular disease." "About one-third of workers report high levels of stress, and high levels of stress are associated with substantial increases in health service utilization."

"The expressions 'work organization' or 'organization of work' refer to the nature of the work process (the way jobs are designed and performed) and to the organizational practices (e.g., management and production methods and accompanying human resource policies) that influence the design of jobs. Organizational downsizing and restructuring, dependence on temporary and contractor-supplied labor, and adoption of lean production

practices are examples of recent trends in organizational practices that have been the subject of increased scrutiny in job stress research." (http://www.cdc.gov/niosh/programs/workorg/, accessed July 6, 2009)

Since 2006, NIOSH has funded CPH-NEW, a partnership between researchers at the University of Massachusetts Lowell and the University of Connecticut. CPH-NEW (www.uml.edu/centers/cph-new) aims to evaluate models for integrating workplace health promotion with occupational ergonomic and mental health interventions. One CPH-NEW project, "Stress@Work," is an education, translation, communication and dissemination effort aimed at various categories of health professionals. This initiative is developing curricula and assisting in training on health promotion-occupational health and safety integration and the relationship between work-related stress and the development of heart disease and stroke. CPH-NEW builds on the work of researchers who have emphasized organizational-level change to reduce sources of workplace stress, rather than individual-level change to help people cope with stress (Karasek & Theorell, 1992; LaMontagne, Keegel, Louie, Ostry, & Landsbergis, 2007; Landsbergis, 2003).

CPH-NEW advisors identified EAPs as a potential category of participants given their responsibilities to employee health. The EAP field clearly addresses organizational-level interventions: the "EAP core technology" described by the Employee Assistance Professional Association includes "Consultation with, training of, and assistance to work organization leadership... seeking to ... enhance the work environment..." and states that "Employee Assistance Programs (EAPs) serve organizations and their employees in multiple ways, ranging from consultation at the strategic level about issues with organization-wide implications to individual assistance to employees and family members experiencing

Literature Review-EAP approaches to workplace stress

personal difficulties." (www.eapassn.org/i4a/pages/index.cfm?pageid=521, accessed March 12, 2010).

In order to better understand EAPs' current perspectives on, and approaches to, workplace stress, we conducted a literature review to address these questions:

1. Does literature for and about EAPs discuss job stress as a concern addressed in EAP practice? If so, is job stress identified as a cause of cardiovascular disease (CVD)?

2. What types causes of job stress are described, and to what degree do these include environmental or organizational causes of stress versus causes rooted in individual employees?

3. What types of interventions are proposed to prevent, reduce, or control job stress, and specifically, how are interventions to change environmental or organizational factors described versus those aimed at changing individual employees?

Methods

Two types of literature were examined: literature for EAPs and literature about EAPs. Interviews with EAPs consistently suggested that the main publications read by these professionals are the *Journal of Workplace Behavioral Health* (formerly *Employee Assistance Quarterly*) and the *Journal of Employee Assistance*. For literature about EAPs, databases indexing peer-reviewed literature, trade journals, and periodicals related to health, employment, and psychology were searched: Academic Search Premier, Business Source Premier, CINAHL, PubMed, and PsychInfo. For both types of literature, search terms included "EAP" and "employee assistance" in combination with anxiety, cardiovascular disease, demand control, effort reward, flex time, flexibility, heart disease, job content questionnaire, job strain, job stress, obesity, occupational health, stroke prevention, and work

organization. Articles were included regardless of publication date. The electronic databases mostly included publications from approximately 1984 through 2007, with a small number of earlier pieces. Articles identified were examined by investigators for substantial relevance to the research questions. One major category not directly relevant to the research questions, critical incident stress management, was excluded.

Results

Themes in literature for and about EAPs were similar and so results from both categories were combined. Responses to the three main study questions generally broke down into the following categories:

1. Literature that names stress as an issue of concern for EAPs to address

      1.a. Some articles name an association between job stress and CVD

2. Literature that names only individual-level causes of stress versus literature that names some environmental or organizational causes of stress

3.a.. Literature that names organizational causes of stress but only individual-level solutions

3.b. Literature that names organizational causes and organizational-level interventions

      3.b.i. Names organizational-level interventions but states that EAPs focus only on individual-level interventions

      3.b.ii. Names organizational-level interventions and states that EAPs do, can, or should include organizational interventions

1. Literature that names stress as an issue of concern for EAPs to address

Several articles for and about EAPs discuss job stress as a concern addressed in EAP practice. Several state that EAPs provide counseling and information on issues including stress ("Employers are Split", 2006; Golding, 2007; Rafter, 2004; Robertson, 2006; Tiffany,

Tiffany, Sinnett, & Sinnett, 1992; Macdonald & Well, 1995), EAPs help people cope with stress ("Employers taking proactive approach to EAPs", 2005), or stress is an important job outcome (Macdonald, & MacIntyre, 1997).

Some go further to present job stress as one of the most common problems or a primary area for EAPs (Rich, 1987; Van Den Bergh, 2000; Yamatani, Santangelo, Maue, & Heath, 1999), a key reason for employers to have EAPs (Lee, 2005; Rich, 1987), or the leading reason that employees contacted a particular EAP (Masi & Jacobson, 2003). In fact, some have suggested that growth in EAPs may be largely due to employer recognition of stress as a workplace phenomenon (Kirk & Brown, 2003).

A few articles state that addressing job stress is actually included in the definition of EAPs (definitions cited in Haaz, Maynard, Petrica, & Williams, 2003; Tiffany et al., 1992). Merrick (2002) states "An EAP is a work-focused programme designed to help employees cope with stress affecting their work." Berridge and Cooper (1993) start from the assumption that addressing stress is obviously part of the EAP function.

Job stress has been identified as an EAP issue in the context of traditional EAP concerns such as alcoholism, drug abuse, depression, absenteeism, and productivity (Etzel, Lantz, & Yura 1995; Haaz, et al. 2003; Masi, 2003; Ramanathan, 1995; von Freymann, 2002). Several state that expansion from a sole focus on substance abuse to issues including job stress was part of the evolution of the EAP field especially during the 1970s and 1980s (Kirk & Brown, 2003; Murphy, 1995). Some authors also connect job stress to occupational safety: high levels of stress can lead to accidents (Ramanathan, 1995), or stress can lead to depression, while co-workers' reactions to a worker's depression can increase his stress and so more accidents (Chima, 2004).

Literature Review-EAP approaches to workplace stress

1.a. Some articles name an association between job stress and CVD

Several articles for and about EAPs name stress as a contributor to CVD. One review of screening and management of CVD caused by job stress discusses the roles of EAPs (Nowack, 2000). In fact, some suggest that concern about CVD could be a principal reason that managers want to address stress (Bull, 1997). Many present this link to overall CVD (Bhagat, Steverson & Segovis 2007; Dolan, 1994; Ramanathan, 1990; Ramanathan, 1995; Robertson, 2006; Shain, 1996). Others specify forms of CVD such as coronary heart disease (Chima, 2004; Clarke & Cooper, 2000; Fielding, 1989; McHugh & Brennan, 1992), heart attack (Kedidjian, 1995), high ambulatory blood pressure and structural heart changes (Felton, 1998), high or unstable blood pressure or high cholesterol (Colligan & Higgins, 2005; Dolan, 1994; Giga, Cooper, & Faragher, 2003; Nel & Spies, 2006). At least one quotes specific study findings on increased risks of stroke- and heart-related disease among men and women with high stress (Lee, 2005). One author challenges this association, skeptically mentioning CVD as one of long list of conditions claimed to be associated with job stress (Reynolds & Briner, 1994).

2. Literature that names only individual-level causes of stress versus literature that names some environmental or organizational causes of stress

Some articles for and about EAPs describe stress as resulting from characteristics, activities, or personal lives of individuals (Macdonald and MacIntyre, 1997; Mendez & Barlow, 2002) and present only individually-oriented wellness, "amelioration" approaches to addressing it (Lee, 2005). Researchers who investigated causes of stress affecting a population of nurses in order to develop recommendations for their EAPs actually excluded measurements of stress related to work. Instead, they focused on family, social roles, and

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individual issues (Howell & Fiene, 2005). One article states that a certain proportion of employees at any given workplace are expected to be troubled, implying that working environments are not a significant contributor. In this view, EAPs help employees manage stress (Fitzerald, Hammond & Harder, 1989). Others state that EAPs can help employees through education, counseling, referrals, and by helping them to cope with relocation stress (Anderson & Stark, 1988; Gaylord & Symons, 1986).

By contrast, a large body of literature for and about EAPs recognizes organizational or environmental causes of stress. This divides into those that, nonetheless, discuss only individual-focused approaches to intervention, and those that include discussion of interventions that focus on the organization or work environment. These two categories are described in the following section.

3.a. Literature that names organizational causes of stress but only individual-level solutions

Several articles for and about EAPs recognize work as an important contributor to stress but offer only individually-oriented solutions. EAPs use assessment, education, and referrals to help people cope with job-related and personal stress (Philips & Mushunski, 1992), since "how we manage stress" is a key to surviving at work (McNally, 1999). Recupero (2003) refers to stress created by the work environment and responds with training in personal skills to recognize and manage stress, such as relaxation training. The article "De-stressing the workforce" (not "the workplace"), describes pressure at work as a source of stress, but presents all individual solutions, including support and counseling provided by EAPs (Cuthell, 2004). Csiernik and Adams (2002) take organizational sources of stress for granted, but examines spirituality and the EAP's role in responding to stress.

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Nel and Spies (2006), Bhagat et al. (2007) and Nakao, Nishikitani, Shima, & Yano (2007) present extensive discussions of environmental causes of stress including globalization, restructuring, and overwork. They include references to the field of the psychosocial work environment including Karasek and Theorell and mention the link of job stress to CVD (Bhagat et al., 2007). Nakao et al. (2007) even uses Karasek's Job Content Questionnaire, a tool used to assess work organization (Karasek, Brisson & Amick, 1998). Bhagat et al. (2007), however, defines EAPs' roles only as helping people cope, and the EAP interventions studied by Nakao et al. (2007) consisted of individual counseling, education, and referral to psychiatric services. Nel and Spies (2006) focus mainly on individually-oriented techniques such as play therapy and the relaxation response. Fronstin (1996) even explains that EAPs offer counseling to help people manage stress and cope with the effects of company downsizing.

Articles about certain types of workplaces describe organizational causes of stress in hospitals such as changes in roles, 24-hour commitment, and role tension. EAPs' roles in this situation are counseling, referral to treatment, and motivation (Howard & Szczerbacki, 1988). An article about the FBI takes for granted that stress is part of agents' jobs involving violent incidents and death. It lists EAPs along with other programs for coping with this stress, but does not mention preventive changes in work organization (Sheehan, 1999). Rich (1987) describes aspects of the press industry that make it stressful, but discusses EAP programs adopted in response to this stress as providing counseling and referrals. One article discusses organizational causes of stress but lists EAPs as a method for addressing this problem by helping individual workers figure out how to solve their own problems (Kedidjian, 1995).

A few articles present a kind of middle ground between interventions focused on the individual and those focused on the environment. They recognize organizational and environmental causes of stress, and discuss interventions that do not attempt to address these root causes but do go beyond individual counseling. These approaches provide organizational support for coping with or adapting to stressful work environments. Some of these authors describe organizational factors associated with stress including economic changes, work hours, staffing, scheduling, time pressures, and work-family balance. They describe EAPs preparing more supportive supervisors and also helping people with family and financial issues (Noelker, Ejaz, Menne, & Jones, 2006), including locating practical information on financial, real estate, and family services (Bromage, 2000; Macalpine, 2003). Nel (2006) mentions on-site training in people skills, conflict management, and other relevant skills to help employees in stressful work environments.

El-Bassel, Guterman, Bargal, and Su (1998) and Pierre (1986) describe the roles of EAPs in addressing workplace stress as building strong social support at the workplace to "short-circuit" effects of stress. Approaches include teaching interpersonal skills, creating formal support networks, encouraging workers to seek people to talk with, promoting the use of resources such as EAPs, and creating after-care systems for employees who have experienced personal crises.

Sprang and Secret (1999) describe jobs that are "demanding, female-oriented, low-paying and emotionally and physically depleting" and therefore stressful. Employer or coworker insensitivity or abusive attitudes towards the distressed employee exacerbate the problem. EAPs can help support and provide information to distressed employees and help employers identify and respond to employees' distress.

3.b. Literature that names organizational causes and organizational-level interventions

Many articles describe organizationally-focused interventions as well as organizational causes of stress. Some cite NIOSH or Karasek (Nissly & Mennen, 2002; Colligan & Higgins, 2005). These are divided between those that describe the particular role of EAPs, however, as mainly focused on the individual, and those that state that EAPs do, or should, intervene at the organizational level as well. (A few articles discuss organizational causes of stress, organizational interventions, and EAPs as a method for addressing this problem, but do not specify their role [Gibson, 1993; Moore, 2001; Blostein, Eldridge, Kilty, & Richardson, 1985].)

3.b.i. Names organizational-level interventions but states that EAPs focus only on individual-level interventions

At least two articles for EAPs and many more about EAPs name organizational-level interventions but state that EAPs focus on the level of the individual. Some argue that organizational interventions are unproven or ineffective and that EAPs can therefore be most effective by focusing on the individual; some that organizational interventions are potentially effective but infeasible or uncommon so that helping people cope is a leading priority; and others that organizational interventions are crucial but best performed by other stakeholders, with EAPs complementing organizational change with individual services.

A brief trade journal article ("Rise in stress boosts EAPs", 2003) falls on the first end of this spectrum, recognizing EAPs specifically as a response to work-related stress but contending that workplace contributions to stress may be overstated. Reynolds and Briner (1994) also argues that organizational interventions are uncommon and unproven. Instead, this author emphasizes employee *perceptions* of work environment problems. The most

important organizational intervention is therefore addressing obstacles that can prevent people from getting individual help in managing their perceptions. MacDonald and MacIntyre (1997) also finds that people's affective reactions to their jobs are more important than actual job characteristics.

Berridge (1993, 1999) reviews a detailed range of work organization changes but explains that barriers to organizational approaches mean that authors still refer mostly to intervention at the level of the individual employee.

Barriers to EAPs leading organizational interventions can include confidentiality. Aggregate data on use of EAP services should be used to help employers or unions target organizational interventions. However, sharing data from small companies or departments could allow managers to identify the employees who have used EAP services. The need to protect confidentiality can also prevent EAPs from taking action to address workplace problems that affect particular employees. These issues limit EAPs mostly to individual advice, information, counseling, and referrals, and potentially to training managers to identify and manage stress (Golding, 2007; Green, 1997).

Another frequently cited barrier is the contracting out of EAP services. Nissly and Mennen (2002) argue that this mostly limits them to individually-focused interventions. The article therefore focuses on EAP-led interventions such as relaxation skills, meditation, biofeedback, fitness, and cognitive restructuring combinations.

A number of other articles discuss organizational interventions including improvements in workload, autonomy, schedule flexibility, and family support services but describe EAPs as working on the individual level (Barrett, 2005; Briner, 2000; Collins & Killough, 1989; Dolan, 1994; Fielding, 1989; Jaffe, Scott & Orioli, 1986; Smith, 1999). For Colligan and

Higgins (2005), EAPs focus on employees' perceptions of stressors and help them to cope, relieve the effects of stress, take responsibility for their stress-related symptoms, and work through issues. Orpen (1984) recommends that EAPs help individuals with stress and refer to psychologists who offer relaxation training. Masi and Jacobson (2003) assessed EAP effectiveness by asking clients how their EAP addressed "their ability to manage work stress." Felton (1998) recommends organizational interventions but suggests that EAPs can help individuals when personal problems further contribute to job stress. A review of worksite depression management mentions stress as a contributor to depression and workplace issues such as unresolved conflict as contributing to stress, but the main role of EAPs is to help depressed employees obtain treatment (Steffick, Fortney, Smith, & Pyne, 2006).

Some state clearly that EAPs' individually-focused approaches are not sufficient to address stress, and that individual counseling must be complemented by a range of organizational interventions to address environmental factors, technology, organizational culture, job design, management style, work load, and work hours ("Causes of workplace stress must be recognized", 1997). Giga et al. (2003) states "Individual person-directed stress management programs that attempt to empower workers to deal with demanding situations by developing their own coping skills and abilities are unlikely to maintain employee health and well-being in the long-term without procedures in place within organizations for reducing or preventing environmental stressors."

3.b.ii. Names organizational-level interventions and states that EAPs do, can, or should include organizational interventions

A body of literature not only recognizes organizational-level interventions for work

stress, but argues that EAP practice is adopting or needs to adopt an organizational focus.

Two key articles, one for EAPs (Shain, 1996) and one about EAPs (Murphy, 1995) provide

extensive historical arguments directly addressing the themes of this review and so are

summarized below. Other articles that discuss these themes are then reviewed.

The article "Employee Assistance and Organizational Change: New Evidence, New

Challenges, New Standards?" (Shain, 1996) proposes that the idea of EAPs as organizational

change agents "has been intimated or discussed in the EAP literatures and EAP conferences

for at least fifteen years. In the case of Industrial Social Work, there has been a history of

efforts to influence the workplace environments from which clinical cases have emerged for

treatment." This author lists references from 1981 that addressed ways for EAPs to affect the

organization and management policy.

   With regard to workplace stress, Shain (1996) argues that EAPs need to understand

recent scientific evidence about the connections between psychosocial hazards and health. He

discusses and illustrates Karasek's demand-control model (Karasek & Theorell, 1992) but

also lists important psychosocial hazards in lay terms (e.g., too much time pressure, duties

that conflict with one another, too little employee influence over what is done, unfair

treatment). This article connects job stress to traditional EAP concerns by showing that

substance abuse potentiates, and home stress exacerbates, the effects of job stress. Although

EAPs probably recognize these connections intuitively, they can make the case to

management more strongly using research evidence. The article proposes that providers

conduct pattern searches for problems that might result from psychosocial hazards, then

provide feedback to EAP Committees or Coordinators, who can use this as input to

management (Shain, 1996).

This strategy involves forming strategic alliances with Occupational Safety and Health and other health professionals, e.g., "One can conceive of a 'working environment committee' struck from the memberships of EAP, OHS and Health Promotion constituencies." They could then make recommendations to management on topics such as communication, division of labor, supervisory practices, sensitivity to needs of minority groups, effectiveness of anti-discrimination and anti-harassment policies, fairness of policies about space, schedules, shifts, physical work environments, and supportiveness (Shain, 1996).

Shain (1996) discusses the issue of internal versus external providers. Some feel that internal providers may not be able to play the role of organizational change agent because they are controlled by management, but in fact external providers can be fired. "This vulnerability of E.A. providers points very clearly, in the view of this writer, to the need for a standard of practice in the field that will make it difficult if not impossible to find a *reputable* practitioner of employee assistance who will agree to forego the role of organizational critic." The author posits a need for leadership in the EA profession to educate about and promote this kind of organizational change.

The article "Managing Job Stress" (Murphy, 1995) presents the full occupational health model of job stress as a framework to describe typical EAP practice: "Historically, EAPs have focused on characteristics of the employee, not characteristics of the job/organization, which may be causing employee stress." "This focus on the individual is evident in the types of stress management programmes offered at the workplace. The most common stress management programmes are those which educate employees about the nature of stress, and change some characteristic(s) of the individual, not the organization." "EAP counselors have not been trained in organizational behaviour, and may not appreciate

the effects of job/task factors and management practices on employee health..." (Murphy, 1995).

Murphy (1995) argues that EAPs provide very limited feedback to management, and rarely regarding characteristics of the job or organization. Human resources (HR) management groups, by contrast, have expertise in job factors and management practices, but focus on performance, not health. Murphy describes NIOSH support for the formation of an HR-EAP collaboration at a large US manufacturing firm that added job stress questions to their climate questionnaire to plan a worksite intervention. Murphy proposes that EAPs focus on interpersonal relationships as well as employee personal characteristics, while the HR management could focus on organizational culture/climate, job/task features, and organizational practices.

Themes discussed by Shain (1996) and Murphy (1995) are further addressed in the articles described below.

EAPs as Part of Integrated Teams and a Holistic Approach

Shain's ideas about "working environment committees" and Murphy's about HR-EAP collaboration have been echoed by others. Lewis (1989) describes workplace stress in the context of occupational health to be addressed by EAPs called occupational social workers. These social workers should be part of an occupational health clinical team, with medical and industrial hygiene professionals and organized labor. Social workers' holistic, integrative approach can address the psychological effects of chemical/physical workplace hazards, and interactions among physical/chemical hazards, work organization and family issues. Eischen, Grossmeier, and Gold (2005) also propose that EAPs lead multidisciplinary intervention teams to prevent workplace violence.

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Stennett-Brewer (1987) and Kirk and Brown (2003) describe EAPs' roles in complementing HR. EAPs should perform Organizational Stress Diagnoses to identify areas of organizational dysfunction. EAPs can take actions to address underlying organizational problems, for example by facilitating problem-solving meetings or consulting for supervisors stressed about difficulties in their roles. Their work should consider organizational factors including effective communication, adequate training and feedback, clear role expectation, and supervisor support (Stennett-Brewer, 1987).

Kirk and Brown (2003) argues that EAP researchers have long recognized a need to address bad work environments, but agrees with Murphy (1995) that EAPs are not usually trained in organizational dynamics or managing the dual-client situation. Therefore, EAPs should partner with other HR divisions. The article refers to ongoing efforts to define each HR division's area and suggestions to re-brand EAPs as Corporate Assistance Programs to better address the individual-organizational interface.

Internal vs. External EAPs

The issue described by Shain (1996) of EAPs internal to the employer versus those contracted externally arises in several articles. Kirk and Brown (2003) describe "slight differences between programs provided by internal and external EAPs," with internal providers reporting more frequent organizational-level interventions and external providers more often addressing family, medical, and legal problems. Ramanathan (1995) argues that internal EAPs are better situated to intervene in the work environment. Bento (1997) also supports internal EAPs, arguing that they are more likely to be successful if they are seen as integral to the HR efforts of the organization, allowing them to propose changes in job design, career planning, and training. Beidel (2005) argues that an internal EAP that is truly

integrated into an organization can help mitigate the stressful effects of major change initiative by being involved directly in planning and decision-making, and provides a series of recommendations for EAP-organizational integration.

Several authors raise territorial issues for EAPs in this context. Kirk and Brown (2003) warn that HR may see EAPs' organizationally-focused efforts as incursions into their territory. Bento (1997) explains "if the people who make decisions in these areas resent the EAP's intrusion in their territory, the results may be personally frustrating to the EAP staff and politically dangerous to the EAP." In addition, the types of organizations that put demands on their employees leading to their need for EAP counseling are presumably the same types that will resist providing the EAP with the resources and flexibility to make needed changes. Similarly, Stennett-Brewer (1987) states "Any stronger attempts by the EAP to affect organizational dynamics on an uninvited basis will risk perception by management that the EAP is an intrusive troublemaker."

EAPs in a Historic Trajectory towards an Organizational Focus

Like Shain (1996), many articles cite changes in the EAP field over previous decades, especially its overall growth and expansion from its original alcoholism focus and the medical model of treatment to a broad range of issues. As far back as 1982, Hayes and O'Connor (1982) proposed EAP involvement in supervisor training on roles and skills to address job-related stress related to role ambiguity, isolation, unclear lines of authority, and other organizational issues. Quoting an earlier social work analysis, Berridge and Cooper (1993) describe EAP history from Stage I of EAPs just identifying and referring problem employees through Stage III: organizational interventions and recognizing systematic cause of problems and Stage IV: serving mainly as organizational development consultant to

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management.

Googins and Davidson (1993) and Midgely (1997) also write that EAPs are evolving towards treating the organizations, rather than individual employees, as their clients. They are increasingly addressing work practices and the work environment to alleviate stress. By the early 1990s EAPs started to address organizational sources of stress, some formally changing into Organizational Assistance Programs (Berridge, 1999).

New roles for EAPs include feeding data back to the organization, convening actors to make policy decisions and strategize (e.g., about provision of child care, work-family policies), influencing policy directly, facilitating collaboration, framing issues, and helping supervisors manage problem brought on by financial downturns or changes in the work environment. (Googins & Davidson, 1993). Midgely (1997) reports that some EAPs now advise companies on ways to change their work practices to reduce stress.

Van Den Bergh (2000) suggests that much recent literature discusses changes in the traditional EAP paradigm of helping the "troubled employee" through referrals and treatment. This article discusses an ecological approach, or goodness of fit between worker and environment, recommending the development of programs and policies to build a caring community at the workplace.

Ethical Conflicts and Contradictions

Problems with the traditional EAP framework described by Shain (1996) and Murphy (1995) are explored more intensively by authors emphasizing the costs and conflicts of this approach. Some authors point out EAPs can be caught in conflict between their roles serving the employer and serving the individual employee (Greenwood, 1997) "...lying as they do in 'disputed territory' between the professional therapists, the personnel managers and the

company financial officers"; Berridge and Cooper (1993) reviews discussions on inherent contradictions between EAPs' role to support profitability and productivity of the company, but also the well-being of employees. EAPs have been accused of being another tool to control deviance and bring employees more fully into the company program, as well as to protect the employer from lawsuits, workers' compensation claims, and conflict with unions. As one illustration, Attridge (2005) explains that EAPs traditionally help companies plan organizational change, e.g., downsizing, to reduce costs. Several sources, mention EAPs as employer methods to defend themselves against stress-related claims (Dolan, 1994; Greenwood, 1997; Keefe, 2005; "Stress risk assessments and EAPs", 2003) or prevent absenteeism (Von Freymann, 2002). Fitzgerald et al. (1989) even argues that it is not in EAPs' interest to address underlying causes of problems.

Some authors present EAPs' current individual-oriented approaches to work stress as actually exacerbating the problem rather than helping to address it. Arthur (2000) argues that EAPs are largely ineffective because they by design do not attempt to prevent or reduce workplace stress, but operate on the assumption that workplaces will not change, and therefore only attempt to reduce the effects of stress by helping individuals to adapt. Another article argues that EAPs can in fact shield employers from knowledge of causes of stress due to confidentiality. EAPs are contrasted with stress risk assessments, which tackle root causes of occupational stress. This article celebrates a model program that, unlike EAPs, uses a counseling service that can "act as an advocate or link with the organization, and to make direct and immediate changes in the workplace, in response to individual needs" ("Stress risk assessments and EAPs", 2003).

A case study of a hospital (Trubshaw & Dollard, 2001) found that stress for nursing

staff results from work speed-up, increased paperwork, reduced staff, and possibly less human contact, and that EAPs form part of the management approach to blaming individual workers instead. This author argues that employing EAPs is a band aid that enables people to remain at work longer under stressful conditions rather than fixing the underlying problems by improving communication and addressing workload and work pace issues. Worse, when one hospital studied had a 1000% increase over 10 years in numbers of employees attending staff counseling services during a speed-up phase, management responded by more stringently investigating overtime and sick leave claims and instituting more authoritarian policies rather than changing the work environment. Data from the counseling service were not even fed back to improve organizational practice and job design. "The naming of a 'social problem rather than a 'work environment problem' as a reason for use of the service further reinforces the notion of individuals being responsible for their own health states and reactions, rather than the responsibility of the hospital management to reengineer the nurse work environment."

Berridge (1999) summarizes EAP practice within a societal context that promotes work stress:

"In the 1980s in Britain, many early programs were of the 'bandaid' type – imposed by a concerned organization on troubled employees to treat the immediate symptoms with little concern for the underlying causes. Where these causes lay within the organization, a fundamental cultural change was often required…. Thus employee counselling represented a tertiary-level intervention, treating employee clients as the inevitable victims or organizational Darwinism in an enterprise culture promoted by Thatcherism."

Bull (1997) repeats the theme of EAPs "…as psychological band-aids, resulting in a wounded workforce which is unable to give of its best." Many US EAPs, in particular, medicalize stress: "Employees are ill and have to be 'treated.'" Counseling could actually undermine trade union or occupational health activities, and, to a trade union, the very existence of an EAP might represent an unacceptably high level of stress in an organization. Robertson (2006) supports this idea: "Companies don't necessarily want to highlight the fact that [staff] can use an EAP because it brings the issue of stress to the fore."

Recommendations for Shifting to an Organizational Focus

Several authors agree that the emphasis on individual programs may actually weaken organizational and environmental change, shift responsibility to employees, and make people cope with stressors without addressing them. Like Shain (1996) and Murphy (1995), these authors respond by recommending changes in the EAP field. Dewe (1994) proposes a paradigm shift in EAP practice to a transactional approach focused on the organization-individual interface and including preventative and organizational change. Findings by Belicki and Woolcott (1996) "…suggest that strategies aimed at modifying organizations, rather than just those directed towards individuals, should be considered when there is a desire to improve employee well being and efficacy." Stennett-Brewer (1987) concludes "…until the organizational dysfunction is addressed, there will be a continual and costly decline in morale, unit performance, and employee well-being."

Gathering and reporting data to the employer is a commonly identified role for EAPs, with an emphasis on protecting confidentiality. Nowack (2000) argues that EAPs need to feed information back to the organization to address work environment factors that cause stress. Donovan (2007) and Barrett (2005) proposes that data on or descriptions of EAP

usage can help organizations identify and address "hot spots." Pitt-Catsouphes, Matz-Costa, and MacDonald (2007) present EAPs as a way to provide data to identify places where people need family-friendly services such as flex time, time off to care for elders and adoptions, gradual return to work, and paid sick leave. Mayer (2001), Feltham (1997), Googins and Davidson (1993), and Megranahan (1990) argue that EAPs need to gather statistical information on workplace trends and stressors and feed it back to employers. In fact, Silcox (2005) describes one company replacing an EAP that did not produce useful data with one that allowed identification of hot spots to target with job restructuring, workload reduction, and other interventions.

Ramanathan (1990, 1995) suggests that EAPs work to form social relationships among employees; advocate on behalf of groups of employees; consult with management and unions on quality of work life, workload, and work organization; and assist in the implementation of the Americans with Disabilities Act. Van Den Bergh (2000) argues that EAPs have the obligation to facilitate "family friendly" services, build peer support, advocate for human HR policies to make employees feel less expendable, promote open communication and collaborative decision-making, and support opportunities for employee education and development. Chima (2004) also proposes that occupational social workers address physical hazards, provide flexible scheduling, and promote other organizational changes to prevent stress leading to depression. Megranahan (1990) primarily emphasizes individual counseling for individual change, but adds "There are likely to be occasions when the problem facing the individual should not be addressed in isolation from their work environment," with methods including "recommendations to the organization that it examines its approach to particular aspects of employee relations."

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Discussion

     We are health researchers exploring possibilities for integrating occupational health with workplace health promotion. This literature review was one component of our efforts to understand the EAP profession's approach to job stress, its causes, consequences, and prevention. It showed that job stress is a major focus of concern for EAPs, and that the association between job stress and cardiovascular disease is well recognized. Although several of the articles reviewed described stress as stemming from personal characteristics, many more described organizational and environmental roots of stress consistent with the understanding prevalent in the occupational health field. Examples include high demand, low control, inflexible schedules, increased workload, and limited participation in decision making, role ambiguity, technological pressures, and job insecurity. Most of these articles also presented organizational-level interventions that can improve the work environment and reduce stress. However, they were split between those that argued that organization level interventions are not, the role of EAPs, and those that argued that EAPs should intervene at the level of the organization.

     Several obstacles to an organizational focus were described. One, the contracting of external, rather than internal EAPs, seems especially common: Estimates from 1995 suggested that over one third of private non-agricultural work sites in the U.S. with 50 or more employers offered EAPs, of which 84% were external, 16% internal, and 5% both (Steele, 1998).

     How visible is the organizational approach to stress in the literature for and about EAPs? We found, on average, about one article per year promoting organizational-level roots

of job stress and/or interventions. As of November 16, 2009, the Google Scholar search engine shows that just six scholarly publications have cited Shain's key 1996 article on the need for a shift to organizational approaches, and that three of these articles have the same first author.

Perhaps most tellingly, a 2009 article on "The Changing Nature and Future of EAPs" (Sharar, 2009) does not explicitly address job stress. This article, presenting "perspectives from four 'thought leaders'" in one of the main journals for EAPs, argues that EAPs need to emphasize health and wellness, but also that their field is experiencing a "drift away from the actual workplace."

Several of the strongest criticisms of current practices are not EAPs (e.g., Murphy (1995)) or are engaged primarily in research and education (Shain (1996), Berridge (1999), Trubshaw and Dollard (2001), Fitzgerald et al. (1989)) and may not understand daily practical constraints faced by the profession. With the exception of describing worksites where EAPs feed back data to the organization, we were unable to identify accounts of organizational interventions led by EAPs. However, we recognize that most work by practitioners in the field is unlikely to be documented in journal articles.

Therefore a key question suggested by this review is whether organizational interventions have in fact become part of EAP practice, at least in some settings, or whether they are limited to recommendations. Addressing this question will require many more conversations with professionals in the field. Our research center began this inquiry, the results of which are outlined in the accompanying article (Nobrega, manuscript under JWBH review).

The structure and organization of the workplace affect people's health directly, and

also affect people's behaviors and lifestyles in ways that in turn affect their health (Punnett, Cherniack, Henning, Morse, & Faghri, 2009). Many of these health effects and behaviors are traditional priority areas for EAPs. Occupational health practitioners are coming to understand the importance of collaborating with other professions to address the exposures and outcomes of common interest (Davis & Souza, 2009). This review has demonstrated that EAPs are not only potential key allies, but that certain leaders in the EAP profession already possess extensive knowledge about work stress and organizational-level prevention. This means that, rather than working to introduce alien concepts into a different profession, occupational health practitioners may do best by seeking partnerships with these leaders and supporting the dissemination of their ideas within their own field. We are especially interested in learning from practitioners who have attempted, successfully or unsuccessfully, to put these ideas into practice and to develop their experiences into practical educational modules for others. We further pursue these themes in the accompanying description of in-depth interviews with practicing EAPs.

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Barriers to Implementation of Workplace Health Interventions: An Economic Perspective

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Running Title

Workplace Health Interventions

Abstract

Objective: To identify insurance related, structural and workplace cultural barriers to the implementation of effective preventive and upstream clinical interventions in the working age adult population.

Methods: Analysis of avoided costs from perspective of health economics theory and from empiric observations from large studies; presentation of data from our own cost-plus model on integrating health promotion and ergonomics.

Results: We identify key avoided costs issues as a misalignment of interests between employers, insurers, service institutions and government. Conceptual limitations of neoclassical economics are attributable to work culture and supply-driven nature of healthcare.

Discussion: Effective valuation of avoided costs is a necessary condition for redirecting allocations and incentives. Key content for valuation models is discussed.

Clinical Significance

A realignment of incentives towards workplace oriented prevention and early disease management will influence clinical care by reducing the burden of morbidity and reorienting treatment more towards organizational and population-based risk factors.

Introduction

This economic evaluation of disease prevention and upstream interventions administered at the workplace is intended to facilitate broader implementation of preventive initiatives and to encourage favorable health outcomes through the valuation of intervention effectiveness. The underlying premise is that modifications of chronic diseases are a function of individual behavior, amenable to interventions in the forum of the workplace, but are also socio-biological consequences of work organization, work demand, compensation, and job security and mobility. Emphasizing the interplay of work life, home life, and individual risk reflects our own affiliation with the Center for Promoting Health in the New England Workplace (CPH-NEW), one of three National Worklife Centers funded by the National Institute for Occupational Safety and Health (NIOSH).

This worklife concept considers biological, socioeconomic, and psychosocial pathways of disease in combination. Content includes ergonomics and aging associated musculoskeletal diseases, work organization and cardio-vascular diseases, and work-family interactions and mental health. The accent on prevention and early chronic disease management (CDM) diverges from customary articulation of the working life concept in Northern Europe, where the emphasis has been on working conditions, protection of leave, and salary replacement for disease or pregnancy[1].

Considerable evidence supports the effectiveness of prevention directed to working cohorts[2], but the divorce of workforce oriented preventive initiatives from conventional group health insurance and financing attenuates available resources. There are nationally idiosyncratic problems of valuing and sustaining investment in preventive programs for working adults in the United States because of the bifurcation of the worker's compensation and group health systems. Insurance companies and the government, the main third party payers, often mediate between and monitor different stakeholders: patients, employers, individual physicians, large group practices, and hospitals. Third party payers have commanding roles in the

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misaligned incentives identified by critics of American healthcare[3]. Accordingly, resource allocation and depletion among adults in their workplaces is a special case of more general health care financing problems. The challenge is to create a viable systems-based incentives approach with an emphasis on the consolidating role of the workplace. Such an approach would utilize principles from traditional neo-classical and behavioral economics to facilitate participation and successful adoption of health interventions. This redirection of insurance reimbursement procedures includes government tax credits and subsidies for prevention and Workplace Health Promotion (WHP) and broader facilitation of workplace organizational change to promote positive effects on health outcomes.

Three types of barriers to more effective and sustainable workplace interventions are:

1. Misplaced Allocations and Incentives
2. Organizational and Cultural Barriers to Implementing Efficient Interventions
3. Systemic Flaws: Supply-driven Medical Care versus Demand-driven Health

1.   Misplaced Allocations and Incentives

- *Defining the Issues*

The primary barrier to implementing preventive and upstream interventions is the misaligned interests of individuals, employers, insurers, service institutions, and government. Consequently, avoided costs from effective workplace oriented prevention cannot be valued in a uniform way. We use avoided costs in the conventional sense, i.e., healthcare costs that are avoided by an occupational safety and health (OSH), WHP, or CDM intervention. Conventional return on investment (ROI) analyses at the company level may insufficiently characterize structural conflicts that separate interests of individuals, firm, insurer, and state (public interest). Measuring cost from the appropriate stakeholder's perspective is a critical component for intervention oriented economic evaluation.

Figure 1 depicts four determinants of improved health outcomes and cost effectiveness in working age populations; an additional fifth sub-category – government tax credits and

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subsidies for OSH and WHP to companies – is added. Conceivably, the alignment of stakeholder interests based on outcomes research and well-structured cost effectiveness analysis (CEA) could produce an Intervention Mixed Constraint Model that would feature comparative options. However, actual alignments suggest conflict as well as overlap.

- *The ROI Problem*

Reported Successful ROI models[4-5] for WHP and CDM appear to be insufficiently convincing for many companies, because benefits from deferred chronic disease costs seem overstated or will accrue to subsequent employers or the government (unless turnover is low). Using a standard business case or ROI analysis, these deferred disease costs vitiate favorably calculated benefit to cost ratios for WHP. If chronic disease avoided costs are subtracted and calculated return is based on worker's compensation claims incidence and costs or ephemeral productivity measures such as lost work time, major capital investments in workplace health are problematic. Furthermore, general trends in improved workplace safety and in process efficiencies have reduced historical occupational hazards. ROI analysis, while useful from a societal perspective, is misleading from a company's perspective.

Even where self-insurance and bargaining power affect some control, there are additional barriers. Employee diffidence reflects worklife concomitants, such as pay and job insecurity, over direct workplace exposure. The worker's compensation carrier recognizes that CDM involves long-term investment, possible compensation for disability, and significant insurance tails. The cycle of worker's compensation insurance involves a highly discounted up front approach to ROI, although capacity for long-term cost sharing between carriers exists. When chronic disease prevention becomes the object of WHP, conceptualizing hazard reduction as an opportunity introduces less straightforward trade-offs. Future costs are routinely approximated through reserves and incidence requires quasi-public reporting and some enforcement, and diseases such as coronary heart disease (CHD) or hypertension exceed these worker's compensation parameters. In most manufacturing and service sectors, group

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health vastly outweighs worker's compensation utilization and costs, and a distribution of medical treatment obligations between group health and worker's compensation carriers for chronic diseases would impose large cost accelerators. Hence, the vigorous defense of carriers against work-related mental health, stress, or heart disease claims. The relationships and varied interests of key stakeholders are summarized in Table 1.

In Figure 2, differing ROI perspectives of major interest groups and their potentially mismatched interests are presented using a demonstration disease, asthma. For employers, disease reduction through controls may not justify ROI if the employee changes employment. Figure 2 illustrates how benefits to an employer or an insurer based on a preventive ROI model can conflict with the capital investment initiatives of hospitals and large group practices whose influence may border on regional oligopoly. From a societal perspective all significant costs and benefits flowing from health interventions share a common weight, regardless of interest group. However, the time horizons of employers and insurers do not coincide. Employers will often pose productivity gains against current prevention expenditures. The worker's compensation carrier's prevention effort is directed to avoiding disability costs that may extend longitudinally, whereas chronic disease can be stipulated. The guardian of long-term social costs, the federal government, is modestly engaged as a leveling stakeholder, but R01 analysis remains important because government can direct tax credits and subsidies for WHP interventions to companies if successful health outcomes elude market forces.

- *The Discounting Problem*

Upstream interventions that engage the active workforce may also upend general assumptions on discounting. Cost discounting presumes that the value of a unit of consumption decreases over time both to individual and society. There are three well-known explanations: 1) individuals discount based on their future mortality; 2) individuals and society prefer not to delay consumption; and 3) marginal gains will decrease in the future due to increases in wealth. Even without aggregating individual and social discount rates, these presumptions are problematic.

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The problems of discounting were recognized by Murray and Acharya[6] who argued against discounting health benefits, although not costs. Workplace health and safety programs may involve deep discounting, since benefits are expected to be frontloaded, and marginal gains are consistently devalued after 'low hanging fruit' have been culled. Contrary to presumption, active members of the workforce cite deferred high function in later working life and retirement as justifying current interventions. The vigorous efforts of working age populations to defend retirement benefits; to balance income, child and elder care responsibilities; to maintain health benefits during retirement; and to participate in union and health and safety activities all indicate that descriptive terms like 'myopia and egoism' poorly characterize behavior. Contrarily, managers may attenuate an original high-level investment when effective programs have realized decreased morbidity and costs. Discounting may be understated for managerial decisions but overstated for workforce decisions.

Application of discounting to interventions in working populations requires contextualizing the organizationally distinct and sometimes conflicting directions of group health, health and safety, and disability managers within the firm and with brokers, and account representatives outside of the firm. Both operating costs and insurance-related cost burdens are diversely segregated by firm sector and size, insurance product, and assumed risk. It makes little sense to regard avoided costs as an encumbered social benefit. Coercion, strategy, and fundamentally different values locate health issues beyond simple marginality, and require extra-market considerations.

2. Organizational and Cultural Barriers to Implementing Efficient Interventions

- *The Group Health Carrier*

Group health carriers share an interest in outcomes research and in transferring costs to physicians and oligopolistic regional providers. Such information may reduce regional practice differences and capital intensive treatments without encouraging upstream prevention. Moreover, when insurers provide administrative services only, avoiding risk, there is little

incentive to reduce capital intensive medical practices. Because costs are generated at the clinical services level, and employers periodically bring their insurances to bid, a fixed reimbursement from the insurer for preventive services is potentially non-competitive[7]. For hospitals and capital intensive specialized practice groups, investments in preventive programs represent potential cost challenges. Horizontally administered services and capital intensive therapeutics are potentially undermined by more participatory and 'educational' approaches that engage different types of service personnel. Incentive realignment modestly influences primary care physicians, although potentially leading to more generous reimbursement. As insurer of last resort and ultimate insurer of the aging workforce, the government's role is complex. Deferring serious illnesses into later life may raise federal health costs, while lowering disability costs in younger individuals. The alignment of stakeholder interests based on outcomes research and well structured cost effectiveness analyses, perhaps, can proceed only within government programs. Furthermore, CEA assumes non-linearity, i.e. the benefit to cost ratio declines as the slope of the relationship is extended. In avoided costs interventions, assumptions of non-linearity may be incorrect, because in working age populations risks are distributed non-uniformly, unlike the classic health economics demonstrations for infectious diseases, where risks are individually uniform.

- *Relationship of the Workplace to Chronic Disease and Aging*

Preventive intervention is encouraged by the aging workforce, increased recognition of links between work status and chronic diseases, particularly CHD, and recognition that health status affects performance[8-9]. An emerging literature links work conditions to individual health behaviors such as smoking, alcohol consumption, and exercise and energy balance[10-11]. Effective WHP programs are expected to address organizational conditions in addition to individual behaviors[12-13], a perspective that escapes the group health orientation.

Upstream worksite interventions suggest several considerations: 1) the continuous improvement ethos seen in product control may provide more successful adaptations than cost-

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driven downstream utilization; 2) attributing work-relatedness of chronic diseases is too often conjectural and conflict-driven; and 3) mechanisms are needed for translating improved health into cost reductions.

- *The Spectrum of Workplace Related Diseases*

That disease categories are not respectful of insurance delineations can be appreciated from Table 2. The category of *Chronic Conditions of Working Life* underscores problems of misallocation of preventive resources. While nerve entrapment disorders and shoulder disease are usually recognized by worker's compensation carriers, musculoskeletal conditions, such as sarcopenia, metabolic syndrome, and reduced metabolic efficiency are nemeses to the current healthcare reimbursement system. Work-related inputs such as job stress, sleep disorders, extended hours, and lack of recuperative time or leisure exercise are addressable at the firm level through WHP, but not within group health and worker's compensation plans. Finally, CDM may align with the workplace for managing existing disease and disease risk: workers congregate; they are accessible during prime hours; and health information can be centrally communicated. Some companies and health insurers offer CDM services, but mitigations include separation from the clinical healthcare system and confidentiality and quality considerations. There is, moreover, no simple mechanism exists for valuation on and reimbursement through the premium structure.

- *Individuation versus Group or Participatory Activity*

The conventional marginal utility approach of calculating distributive effects at the individual level appears limited, even obsolete, when adapted to working populations at the group level. Intervention research introduces the importance of participatory group consciousness and activity in effecting health risk reduction in communities[14] and in workplaces[15-16]. Egoism and altruism, applied to the avatar of 'economic man', overlooks the important role of participatory organization in effecting workplace change and potential change in individual health behavior. The logic of calculating distributive effects at the individual level is

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dispersed by health self-efficacy (HSE)research evidence that changes in health behavior in a single domain becomes generalized and that demands are likely to be collective or social not individual[17].

It is unnecessary to invoke the Viennese ghosts of Böhm-Bawerk and Victor Adler to resurrect psychological and industrial democratic visions of value that diminish the utility of individually-based models for assessing working populations. The argument of 'moral hazard' presumes that cost is driven at the individual level by an informed or irrational search for intensive life sustaining technology. However, for serious diseases, intensiveness and cost of care are often unrelated or inversely related to health outcomes[18-19]. Weinstein et al.[20] have documented that the historical surgical pattern in Medicare regions, not morbidity, drive increased rates of spinal fusions and associated increases in discectomies and laminectomies. Effective workplace conservative programs featuring ergonomic job redesign and accommodation to chronic disability[21] seem to occur in a different universe.

Workers do not select expensive and ineffective treatments because of 'gold-plated' benefits and 'Cadillac plans'. It is a misconstrued model that places decision-making and cost burden on the patient. The alternatives are not prevention versus intensive interventions. Reducing ineffective intensive interventions occur largely outside of effective prevention. Stated another way, we can assume counterfactual partial nulls.

- *Productivity and Workplace Health Promotion*

In an often articulated view, preventive health investment can be rationalized at the level of the firm through increased productivity[22]. The argument that more effectively utilized human capital comes from improved health status has sometimes lead to highlighting short-term gains in productivity, rather than longer-term impacts on chronic disease reduction[23-24]. Cost effectiveness information on OSH and WHP interventions feature inconsistent and/or non-comparable definitions of effectiveness[25]. Traditional measures of productivity -- lost work time, medical and worker's compensation claims, unit output -- are useful but approach health status

and chronic disease indirectly. Productivity arguments and the supposition that improved health status lowers medical costs are undercut by evidence that medical costs in this system of contesting interest groups have supply-driven escalators that operate independently of health status.

Still, many of the cost effectiveness arguments for WHP seem to show advantages for program participants[25]. Chapman[5] performed meta-analysis on 42 epidemiological studies, combining 537,319 employees, averaging for 3.6 years follow-up. In 20 of the 42 studies, absenteeism decreased by an average of 30%. Health care costs decreased on average by 21.8%. Sixteen studies with CBAs reported positive ROI: every $1 spent returned $5.67 – range, $3.40-$7.88). Controlling selection and short-term efficacy are problematic; positive effects appear more modest when economic metrics, such as reduced group health costs, are weighed[26].

3. Systemic Flaws: Supply-driven Medical Care versus Demand-driven Health.

Arguments about misplaced incentives are illustrated by CHD where there are recognized effective preventive interventions: dietary change, exercise, control of blood pressure and lipids[27]. The Framingham study confirms that a significant long-term downward trend in CHD mortality has been influenced by emergency care but modestly affected by non-acute invasive cardiology[28]. Nevertheless, over the past two decades, the growth of invasive procedures has been geometric, despite limited evidence of improved survival[29]. Ryan et al.[30] described how substitution for surgery by less costly stenting escalated healthcare costs due to volume appreciation.

In a supply driven system, a concave demand curve would be anticipated. The output of procedures should be reduced under conditions of imperfect competition, even accepting that there are regional health care oligopolies, hospitals and medical groups, sustained by insurers. Almost the opposite has occurred, with growth in invasive procedures and extensive regional variations unsupported by outcomes evidence[31]. If utilization is detached from clinical severity

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or demand, any resource reallocation resulting from effective upstream workplace interventions is unlikely to reduce costs, and a preventive infrastructure has built-in competitive disadvantages. This conflict is unlikely to be resolved by mutual efforts limited to employees and labor organizations, business groups, and worker's compensation carriers.

The valuation problem has additional workplace ramifications that include productivity measures and time allocation for staff indirectly providing preventive health care. Valuing avoided costs from successful interventions is essential for determining ROI but is insufficient to control costs under current conditions. It is necessary but not sufficient for successful worklife interventions.

- *Future Research Directions for Valuing Avoided Costs*

Some comprehensive multi-component health promotion programs and other relevant wellness interventions have produced positive health and financial outcomes, particularly for comprehensive multi-level interventions [5,25,32-33]. As noted, improved methods for determining ROI/CE are required. The current paucity of "accurate" data on intervention effectiveness, outcome variables and assumptions, differences in study designs, and intervention costs complicate inter-study comparisons and hinder development of standardized methods for appropriate ROI or CE models[34].

The workplace is not a homogenous entity. Differences between large and small and medium-sized enterprises that employ 50% of the working population, and between sectors must be addressed in any research design and analysis of interventions. Economic evaluation models require specification to these size and sector characteristics, as well as to workplace culture.

Particularization of cost evaluation to each stakeholder is a critical step in an economic evaluative for aligning incentives. Table 3 delineates some alternative cost estimates for each stakeholder[35-36]. This choice model necessarily reduces to several key questions:

- Who is affected?

- On whose behalf decisions are made?

- Whose health would gain and who would be paying for it?

The answers determine relevant health outcomes, allocated resources, and measurement tools. Economic characterization of intervention effectiveness requires tracking several major outcomes groups.

These include:

- Health outcomes: intermediate endpoints such as bio-markers, case-defined incidence reduction, and modulation of severity or disease natural history accounting

- Economic outcomes: productivity losses; absenteeism and diminished performance, productivity improvements; turnover rates; labor replacement costs

- Insurance impacts: group health care costs, workers compensation medical and indemnity costs, and disability payments

- Time profile of disease costs: immediate versus lagged effects

Identifying mitigations that effectively align incentives to different stakeholders requires a determination of impacts, beneficial as well as adverse, on each of the stakeholders, further stratified by the type of intervention. Mitigations include insurance reimbursement procedures, and government WHP tax credits or subsidies to employers. A valuation model must algorithmically create a pay-off matrix for all stakeholders for each intervention. Absence of such constructs undermines statutory prevention efforts based on health insurance, either in wellness or upstream administrative articulation.

From the employer's perspective, policy making requires ROI or Cost-Benefit Ratios that convert outcome variables into monetary units. From a societal, governmental, or insurance company perspective, CEA or Cost Utility Analysis (CUA) are the relevant measure for resource allocation[35-36]. Metrics coming from these approaches would help prioritize systematically scarce resources for prevention and WHP. The ROI business model may not work for very small firms

and for OSH interventions that do not significantly enhance productivity. Changing workplace practices that improve OSH will require legislation, perhaps as government subsidy to smaller firms. The types of productivity growth expected in some non-manufacturing sectors may also vitiate the argument for direct investment in OSH.

To effectively tailor interventions, economic and non-economic variables that explain efficacy variation from interventions require analysis and granular data tracking at the individual level. Introduction and refinement of a surveillance component at the facility level pre-supposes relevant outcome and economic data collection.

This type of facility-oriented surveillance is an implicit aim of NIOSH's National Worklife Initiative. In a CPH-NEW intervention research study of nursing homes, a net-cost model was applied to a series of WHP and OSH interventions[37]. A key ergonomic intervention was a no-lift program (NLP). Economic analysis was used to supply valuation of efficacy to several important intervention components. The goal was to identify program features and organizational and management changes, deemed essential for improving outcomes. Some conventional WHP activities seemed to enhance injury and disease reduction components of the NLP. Despite site variability, net savings from the NLP intervention were greater when the NLP and WHP were combined[37]. Since the NLP intervention entails capital investment with organizational and training elements, adding more individualized WHP involves a different type of cost, whose inclusion is central to valuing intervention effectiveness. Both the micro level basis for a "business case model" for OSH interventions and the macro level basis for reducing health care costs and improving prevention are served by recognizing appropriate organizational determinants and employee characteristics.

Steering people towards more effective choices (e.g. increasing participation rate) shares natural affinities with behavioral economics. Aligning incentives for different stakeholders by getting "prices right" follows the reasoning of neoclassical economics, the

presumption being that markets efficiently allocate resources without government interventions, and that consumers make utility-maximizing rational (appropriate)choices. Without resort to dynamic or instability contingencies, neoclassical models fail to account sufficiently for cost and performance in the healthcare sector. Choice and transparency, alone, will not sufficiently empower the public. Behavioral economics challenges the assumption of rationality and supplements the traditional financial incentives of "prices" with principles from behavioral sciences[38-40]. Thaler and Sunstein, the authors of "Nudge", describe how people can be gently maneuvered into doing the right thing by organizing decision context through services of "Choice architects"[38]. Small, seemingly insignificant detail can impact individual behaviors. Since, there are systematic biases in patterns of thinking, targeting those biases can enhance intervention effectiveness.

Limited data on intervention effectiveness and costs for WHP and CDM programs hinders prevention, but also solicits interdisciplinary collaborative interventions that integrate economics research with prospective studies at company or institutional levels. Steps include:

1. Develop a model in a structured format based on a systems approach with appropriate study design to ensure internal validity.

2. Enumerate the variables and drivers or functions of effectiveness (e.g. participation rates).

3. Induce behavioral change with respect to the different stakeholders, based upon the principles of consumer economics/behavioral economics, health economics, industrial organization etc.

- *Summary: A call for Interdisciplinary Research Collaboration*

The demand for evidence-based outcomes from workplace prevention and upstream health interventions invites rigorous research and an appropriate framework. Intervention and outcomes research will be insufficient, if divorced from valuation mechanisms, and if structural barriers are not dismantled. The reallocation of current incentives cannot be accomplished

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without imposition on insurers and public payer prerogatives. Resolution at the firm level is unfeasible. Without alterations in tax and tax credit structures, sufficient capital investment in work design is improbable. While insurers may impose some expectations for workforce health in the fully or partially insured firm, their approach is contingent and excludes the largest corporations that often set trends and dominate consensus business health groups. Moreover, implications for hospitals and capital intensive group practices are adverse: disease reduction would put upward pressures on unit costs. The federal government, large health systems, or large purchasing groups could alter these relationships, but not in the current environment. Direct investment by employers in long-term maintenance of workforce and chronic disease prevention is essential, but not sufficient. For now, the linking of intervention research with valuation models seems a necessary pre-condition for fundamental resource re-allocation.

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Table 1. Understanding Stakeholders Interests: Shifts in the Reimbursement of Prevention

	Employers	Employees	Insurers: Workers comp	Insurers: Group Health		Health Care Providers: Hospitals, Labs, Capital Intensive Groups	Health Care Providers: Primary Care Physicians & Nurses	Government
Key Concerns re: WP Prevention	• Large cap-ex • Not realizing full financial benefits • Pricing methodology of premiums • Benefits are long term • Productivity gains may be limited	• Large occupational hazards • Negative health outcomes • Inadequate interventions • Asymmetric information on occupational hazard risk • Requires out of pocket expense for medical care and wage loss • Productivity gains may not translate to higher wages	• Seek more control over Work risk management • Companies unhappy about rising premiums • Rising Workers Comp Claims expenses	• Shift of financial risk to physicians • Potential losses on fixed reimbursement payment schemes	**Key Concerns re: WP Prevention**	• Decreased utilization of facility • Less procedural intensive treatment • Transfer of funds to community based resources • Seek adequate revenue from routine screening and prevention	• Potential losses on variable reimbursement payment schemes • Incentive system might be skewed more towards treatment rather than prevention and promotion	• Implications for Government's share of Health Care Costs
Implications for Insurance Reimbursement	• Reimburse intervention programs • Identify conditions for intervention	• Reimburse programs for effective life style changes • Develop measures of program/intervention success	• Mechanisms for cost sharing	• Use of outcomes analysis to reimburse utilization • Economic and econometric measures for linking cost and outcome • Translation of risk reduction into rate structure	**Implications for Insurance Reimbursement**	• Recognize safe and effective practices and improve public health and safety regarding medical management decision • Shift from procedure centered care	• Develop methods for reimbursing treating physicians involved with prevention programs • Enhance primary care physicians' role	• Direct investment in prevention and promotion • Outcomes related databases and small area data for working age population • Develop reimbursement models based on CUA and/or other outcomes models

Table 2. The Spectrum of Work Associated Disorders

Exposure Specific Disorders — mixed or etiology specific		Chronic Conditions of Working Life		Conditions Suitable for Workplace Disease Management	
Disease	**Workplace Exposure**	**Condition**	**Workplace Intervention**	**Disease**	**Management**
Asthma	Intrinsic and multiple extrinsic agents	Hip and Knee Arthritis	Job design and age-adjusted work	Diabetes Mellitus	Glycemic and treatment monitoring
Bladder Cancer*	Dyes, ingested carcinogens	Obesity	Workplace design/ diet and exercise	Colon Cancer Screening	Colonoscopy screening
CTS	Biomechanical factors, vibration	Metabolic Syndrome	See above and disease management	Hypertension	Ambulatory and static BP monitoring
Chronic	Dusts and fumes, smoking	Sarcopenia	Job design and age-adjusted work	Mental Illness	EAP services
Contact Dermatitis	Multiple irritants and sensitizers	Coronary Heart Disease	Organizational and workplace redesign	Skin Cancer	Dermatologic screening
Hearing Loss	Noise, co-factors	Stroke	See above	Hyperlipidemia	Blood tests and health promotion
Parkinson's*	Heavy metals, host factors	Dysthymia/ Depression	Work organization and time flexibility	These interventions presume the usefulness of the workplace as a setting for disease screening and monitoring	
Low Back Pain	Biomechanical strain, host factors	Reduced cognitive Performance	Work organization, noise- repetition control		
MCS	Multiple agents	Loss of trunk stability/coordination	Job design and age-adjusted work		
AML	Benzene, Ionizing radiation	Rotator Cuff/ Impingement	Conditioning, job redesign, retraining		
Lung Cancer	Smoking, radon, workplace carcinogens*,	Entrapment Neuropathy	Diet and exercise, job redesign		
* Rare Disease or Decreasing Exposure Risk		Sleep Disorders	Work organization		
		Soft Tissue Disorders	Job design and age-adjusted work		

Table 3. Cost Perspective

Employer: Costs of investment on equipment and labor for the interventions; productivity changes; absenteeism and presenteeism; costs for employee turnover; changes in Workers Comp Claims (self-insured); group health costs (self-insured), short and long term disability (self-insured); changes in premium paid to insurer (if not self-insured), tax incentives for capital purchases.

Employee: Out of pocket expenses; uncompensated lost work time; opportunity cost of care giver; return to work issues

Insurer (Workers Comp): Cost incurred on Workers Comp Claims for medical care; cost incurred on claims of lost work time (indemnity)

Insurer (Group Health): Covered cost of incurred medical care

Insurer (Disability): Short and long term covered costs

Government: Covered costs in medicare and medicaid

Societal Cost: All of the above costs excluding double counting and transfer payments(taxes and subsidies)

Figure 1. A New Paradigm for Insurance Reimbursement

Vision: A New Paradigm for Workplace Interventions

Improved Health Outcomes

Disease Management

Interventions

Interventions

Prevention

Promotion

1. Reformed Insurance Reimbursement
2. Govt. Tax Credits for Wellness to Employers

Improved Cost Effectiveness
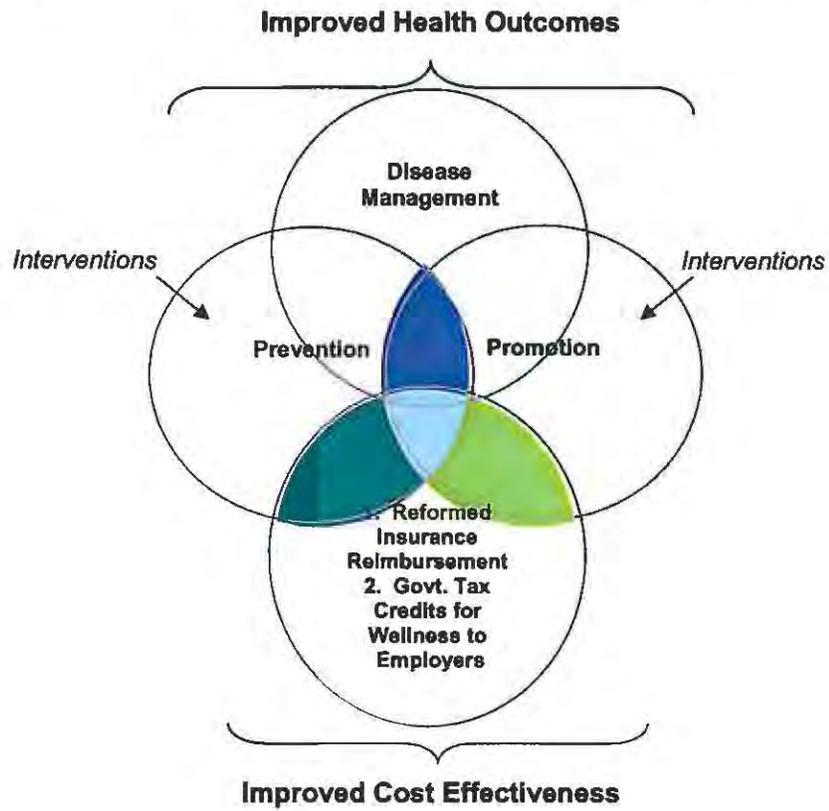
Figure 2. Competing Interests and Cost Allocation

Intervention and Reimbursement
Incompatibilities: work related asthma

	Employee/ Patient	Current Employer	Future Employer	WC Carrier	Current Group Health Carrier	Future Group Health Carrier	Clinician	Capital Intensive Provider	Medicaid/ Medicare
Asthma Claim Accepted	Red	Red	Green	Green	Green	Green	Green	Grey	Blue
Asthma Claim Denied/or Unrecognized	Red	Red	Red	Grey	Red	Red	Green	Grey	Blue
Interventions									
Engineering Controls	Green	Red	Green	Blue	Green	Green	Red	Red	Green
Asthma Case Management	Green	Green	Green	Green	Red	Green	Blue	Red	Green

Costs	Benefits	Neutral	Mixed Picture
Red	Green	Grey	Blue

Lawrence Community Connections will complete the following work:

Play a leading role in the planning and design of the community outreach work

Provide overall leadership to the project and research design with Ms. Grullón's continuing role as co-Principal Investigator.

Plan and implement an outreach campaign through local ethnic media to promote the contractor-based health and safety intervention program.

Directly recruit three construction contractors to the intervention program.

Participate in designing recruitment materials for the intervention program.

Collaborate in writing journal articles and preparing and delivering conference proceedings about the research results.

The City of Lawrence Community Development Department will

Recruit contractors to the contractor-based health and safety intervention program through in-person outreach and distribution of recruitment materials through Community Development, Inspectional Services, and other City offices related to contractors, building, and development.

Provide overall project and leadership through participation in the project's Steering Committee.

Build relationships and share resources through participation in the project Networking Committee.

Participate in outreach activities designed to feature local services in discussions with City residents and local contractors.

Chapter 38

Implementing Programs and Policies for a Healthy Workforce

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January 5, 2010

Occupational medicine has infrequently addressed chronic diseases that are not directly related to work. Yet health problems that accompany normal aging, such as cardiovascular disease (CVD), degenerative osteoarthritis, and depression, may also be influenced by the psychosocial work environment and other job exposures.[1-3] Occupational medicine has not yet tapped the full potential of using the workplace as a venue for prevention of chronic non-occupational diseases and for promotion of overall health and well-being.

The concept of Working Life involves designing and implementing workplace programs to prevent chronic diseases or their complications.[4] The continuum of approaches encompasses those that are traditionally part of workplace health promotion as well as those of occupational health, although it is the genuine integration of these that makes the whole greater than the sum of its parts. Working Life programs may include:

1. Worksite health promotion and disease management programs that promote healthy lifestyles or encourage compliance with appropriate clinical treatment, including direct provision of medical care, screening, and clinical services.
2. Programs that mitigate or prevent chronic disease processes influenced directly by work, such as ergonomics programs and reorganization of work processes to reduce job stress.
3. Programs that address aspects of work affecting quality of life, such as government or employer accommodations for sickness and family leave, child welfare and child care, continuing education, transportation, and housing.

Historical Concepts of Working Life
The Working Life concept is not new to the occupational health field in Great Britain and the United States. In 1830, the British physician Charles Turner Thackray published a masterpiece of occupational medicine that described the effects of urban industrial life on the newly-developed working class population of Leeds, England.[5] Thackray's world has very little in common with the urbanized workforce of developed countries today. However, his areas of interest affirmed the linkages between occupational medicine and both general medical care and public health. His concerns included controlling dust-related diseases in mines and tuberculosis in milliners, as well as child development in working families.

In the United States, there was much public health activism in the early 20th century that emphasized the relationship among work, socioeconomic status, and morbidity and mortality. Both Alice Hamilton[6] and Isaac Rubinow[7] discussed the high rates of death and disease in working families compared to those more well-off, who could afford a healthy lifestyle, including good nutrition, access to medical care, safe and healthful working conditions, and adequate leisure time.

The simplest component of work organization is working hours. Some of the earliest interventions by occupational health physicians in England and the United States involved limitations on the workweek and prohibitions of child labor. Over the past 100 years, the average workweek has been reduced dramatically. However, the most recent pattern has been a gradual increase of working hours. In 1900, the average workweek in manufacturing in the United States was 53 hours. During the Great Depression, the average workweek for production workers in

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manufacturing decreased to 35 hours. During World War II, it increased to 45 hours. From 1977 to 1997, the average workweek for full-time workers increased from 44 to 47 hours. There were further increases until 2007, when an economic recession began.

In Sweden in the 1970s and 1980s, there was a broad-based effort to alter work organization and work role based on principles of health and quality of life and reflective of social democratic traditions. This has differed from the United States, where market theory presumes the moral hazard of generous social welfare interventions and the prerogatives of corporations within workplaces. It also differs from some liberal and Marxist traditions, which presume a necessary relationship among technology, division of labor, and work roles. Work structures -- and therefore work-life accommodations -- should be similar at equivalent levels of development in industrial countries. The Scandinavian model has put less emphasis on deterministic laws and a greater emphasis on managerial choice in designing work organization as well as work and non-work relationships. Much of this was reflected in the Swedish Work Environment Act of 1978, which placed equal emphasis on the physical and psychological health of the workforce and involved labor organizations in the design of work conditions.[8] In Denmark, similar programs addressing quality of work life were influenced by the European Health and Safety Directive of 1989.[9]

In 2003, Sweden and Denmark had high ratings for quality of work life and for workers' self-assessment of their impact on decision-making. These and other Scandinavian countries also ranked high in other priorities, including training opportunities, avenues for professional development, and job security. However, Sweden, in particular, has since experienced dramatic reduction of working-life initiatives and elimination of its federal occupational health research institution.

The European Union (EU) has introduced a cross-national emphasis on common concerns such as disability and employment as well as aging of the workforce. For example, it has established more generous retirement and disability benefits and an earlier age of retirement than in the United States. These policies are thought to account for the higher unemployment in Europe among older age groups: 45 percent of adults aged 55 to 64 in the EU are employed, compared to 59 percent in the United States. In the EU, only 9 percent of people aged 65 to 69 work outside the home, compared to 30 percent in the United States. In addition, 20 percent of EU workers leave employment because of "working life" issues such as illness and family responsibilities.

The EU also focuses on transnational health and safety regulations. For example, its physical hazards directive emphasizes transnational standardization of tools, exposure standards, and disease surveillance, although management of work-related diseases and injuries is left to the individual companies or national worker-protection programs. In contrast, in the United States, weaker governmental protections and employer provision of health insurance has led to more investment in Working Life programs by the private sector than by government.

Work-life (or work-family) imbalance refers to the adverse effects of work demands and stress on family life and health.[10] In the United States, it assumes a sustainable equilibrium, at least partially controlled by workers who can personally recalibrate this equilibrium. However, in Europe, it has been presumed that stability in working populations can only be maintained by

legal protections and interventions by a welfare system. These differing traditions are reflected in legislative protections. In the United States, there is no a federal law requiring paid sick days or paid maternity leave. (However, the pending Healthy Families Act would require employers with more than 15 workers to provide their workers with 1 week of sick leave annually.) In contrast, Norway provides 96 weeks and Denmark 52 weeks of paid maternity leave.

The European Foundation for the Improvement of Living and Working Conditions ("Eurofound") conducts surveys and makes policy recommendation throughout the EU to develop a balance between family life, personal commitments, and working time.[11] The Eurofound has identified three key areas for policy development: career and employment status, health and well-being at work, and career development. Work-life balance features the reconciling of work-family conflicts, especially with progressive policies concerning child-care, working time, and parental leave.

Because economic level, technology dissemination, and divisions of labor are somewhat parallel in countries with similar levels of industrial development, there are some common themes between Europe and the United States in the concept of Working Life. The situation in the United States has some particular emphases or distortions because of the more limited role of government in determining working conditions and work-life considerations, such as child care. Employers also play a greater role in the subsidization of health care. Therefore, there has been a particular emphasis on more individualized aspects of work-life balance, such as flexible working hours, especially in companies where retention of a skilled workforce is paramount. There has also been an emphasis on health promotion and lifestyle changes that may improve health status and lower costs of medical care.

In the United States, the concept of Workplace Health Promotion (WHP) encompasses two core approaches that are sometimes in conflict. The more common approach envisions health and the prevention of chronic disease as largely a function of individual behavior and adverse lifestyle choices or dispositions. The focus is on individual responsibility and lifestyle change -- improving diet, exercising, losing weight, and stopping smoking. The workplace is seen as a venue where programs can be developed and implemented, and wage-and-benefits systems can be the source of incentives. Typical services may include influenza immunizations, blood pressure and serum lipid measurements, and disease-awareness events. Assessment and tracking services may be offered onsite by vendors, or on-line. Sometimes WHP may include Employee Assistance Program (EAP) services, disease management (such as for medication compliance), and cancer screening services.

A second approach to WHP envisions health as a reflection of individual behavior, social and family factors, and environmental conditions, including work quality and reward. Some factors are therefore outside individual control, requiring strategies that involve the nature of work and social considerations, such as family responsibilities. There may be an emphasis on organizational relationships at work, job stress, accommodations for older workers, and roles for employees in making health decisions. It is understood that the workplace influences health, such as by the physical and psychosocial organization and design of work, with particular attention to job stress, cardiovascular disease, and depression.

Most WHP practice in the United States has been based on the first of these two approaches, the individualized perspective. However, limited personal resources often affect the capacity to make lifestyle changes, especially for low-wage workers. Organizational culture and managerial initiatives on health are complicated and their success is influenced by both organizational size and available resources. The term *culture of health* is sometimes used to describe WHP initiatives that go beyond a focus on individual workers.

In practical terms, these two approaches to Working Life and behavior change are contained in the unifying concept of productivity. The concept does not, however, bridge the apparent distinctions, as it has meant a variety of things, including units of output/cost and the skill and decision-making qualities of a workforce. A general scheme is detailed in Figure 38-1.

Theories related to Integration of Work and Non-work Life

The Socio-Biological Model: A social gradient predicts morbidity and mortality.[12] The effect is not limited to all-cause mortality; it includes many chronic diseases, such as cardiovascular and cerebrovascular disorders. Occupation and Working Life represent a major component of the health gradient observed with social hierarchy, education, and income.[13] During midlife, social inequalities exert their greatest effect on health.[14] Possible explanations for this finding include the extent of social network and support, high demand and low control at work, imbalance between workplace effort and reward, and traumatic life events, such as unemployment.[15-19]

Incorporating these concepts, some experts oppose the conventional sociological view of fixed external constructs with the concept of the "psychosocial environment," meaning the social and structural range of opportunities available to the individual to meet core human needs: well-being, productivity and positive sense of self.[20] They take the perspective of health self-efficacy -- that a positive experience of self relies on one's social environment[21]. In this context, work and non-work life are critical components of a communitarian whole. While this form of analysis may appear "soft" compared with the biomedical exposure-based perspective of traditional occupational medicine, stress effects on the individual worker involve both intrinsic physiologic components and extrinsic combinations of factors that cannot be physically measured directly.

At the core of these models are the two major stress models, the Demand-Control Model[22] and the Effort-Reward Imbalance Model[23] (see Chapter 14). Their application to the broader concept of Working Life also has come from the expansion of the model of high demand and low control to home life. Low control at home predicts coronary artery disease in women (although not in men); it appears to result from a lack of material and psychological resources.[24] A more conventional way of looking at work-family conflict may underestimate important interactive effects, with women's representation in the workforce being amplified in work where there are significant time demands, limited economic rewards, and limited job control.

Stages of Life: Working Life has been indirectly addressed in epidemiology through the Stages of Life concept,[25] which refers to biological, behavioral, and psychosocial influences that occur over the life course, including past-generational and genetic patterns. A key concept is that there are critical periods, after which there may be irreversible adverse health effects. Although the

major emphasis has been on early childhood exposures, there is also a "chain of events" concept which addresses critical adult-life stages. For example, job loss can lead to family strain, physical abuse, and divorce. Adverse events in critical or physiologically sensitive periods may be linked, either additively or by triggering a critical health event. The quality of health risks and composition of working life demands vary in different age groups. In younger workers, child-care and financial concerns may predominate. Later in life, family responsibilities may shift to elder care and personal management of chronic diseases. Implicit in this concept is the interaction among broad national and social trends, the workplace and the family, and individual health.

Aging and Work: Because clinical expression of chronic diseases begins to increase in the fourth decade of life and because the workforce is aging, there has been an increased public health focus on work and aging. The fraction of U.S. workers older than 55 is increasing from 13 percent in 2000 and 17 percent in 2010 to a predicted 19 percent in 2050.[26] In 2010, 48 percent of the U.S. workforce is female, with the largest aggregate increase in the 55-to-64 age group (which will increase by 25 percent in the next 10 years).

The term *age management* explains adaptive accommodations and corrections for aging workers in the contemporary industrial workplace. It presumes that control of personal, organizational, and biomechanical risk factors in the workplace can accommodate age-related changes in physical function. The combination of longevity and altered economic conditions has made older workers (age 55 and older) the most challenging aspect of workforce management. Critical elements of the Working Life concept are preservation of physical and mental capabilities in older workers and necessary accommodations to changes in physiological functioning and the greater need for chronic disease management.

As workers age, clinical symptoms increase and their functional capabilities decline. For example, as people age they lose muscle strength and have an increased prevalence of musculoskeletal disorders. However, progression of diminished function with age is not uniform. In one study,[27] among Finnish municipal workers older than 45, exercise capacity -- a strong predictor of sustained employment -- declined by more than 20 percent over 5 years, compared to an expected annual decline between age 30 and 70 of less than 1 percent. Over 10 years, one subgroup experienced a 50 percent decline in isometric trunk strength and spine mobility after age 45 -- more than four times the comparison rate. Trunk strength and function appeared to be especially predictive of work capacity in the fifth and sixth decade. Targeting interventions to workers with the most marked decline in musculoskeletal function mirrors community health interventions where the greatest yield comes from addressing problems in those at highest risk.

Working Life in Relation to Occupational Health and Safety

A focus on a healthy workforce and worker well-being requires a different perspective on employee health and safety than that of traditional occupational health and safety protection programs (Table 38-1).

For a long time, there has been a separation between those concerned with control of hazardous occupational exposures and resultant health risks and those concerned with reduction of

individual and community health risks primarily through behavioral change.[28,29] Labor unions and occupational health specialists sometimes regard workplace-based health promotion programs as a diversion of scarce resources from investment in safer equipment and work processes. By emphasizing a focus on a few high-risk workers, the WHP approach can distract attention from the occupational health needs of all workers.[30-32]

In contrast, some employers and WHP advocates attribute most morbidity, such as musculoskeletal disorders, to individual worker characteristics, such as obesity and lack of physical fitness, or to non-work activities and community exposures. This perspective recognizes that (a) risk factors for chronic disease and measures to maintain high function and effectiveness of workers, are not confined to the workweek; and (b) a high functioning safety culture cannot eliminate all injuries or chronic diseases.

Work organization and Working Life issues also affect the treatment of individuals with chronic disease. The issues are not simple, however. The effect size of the significant differences in CVD associated with cholesterol control are still mediated by socioeconomic position -- and presumably its work hierarchical components.[20] There are several countries where lipid levels are not altered by the socio-economic gradient.[33] In the United States, extensive pharmacological intervention with statin drugs has had a greater effect on reducing serum cholesterol than in the United Kingdom.[34]

Company size and profitability are also important factors.
The largest -- often multinational -- employers have been the most effective in reducing safety hazards, often because they have more resources available. These employers often have the best Working Life policies and programs, such as flexible employment hours, as well as onsite WHP services, exercise facilities, and healthful food. The richest and most technically innovative employers and sectors may attract highly talented workers for whom lifestyle programs are important. However, large multinational employers often relocate many workers on short notice, suggesting that their dominant concern may be short-term performance rather than long-term employee health.

In many larger companies, WHP activities, administered either through vendors or company programs, have replaced traditional occupational health functions such as those of occupational health nurses. For example, the provision of services such as vaccinations, hypertension screening, and health counseling is often performed by insurance company personnel, human resources department employees, and/or health-and-fitness contractors.

Different conditions may apply for smaller employers or employers chiefly engaged in the manufacturing sector, where hiring and termination are less fluid and where the focus is on retention of healthy workers throughout their working lives. For these smaller employers, more utilitarian goals may be more suitable, such as reduction in risks for musculoskeletal disorders, cardiovascular disease, and diabetes, and provision for the impacts of major life events. Therefore, choices of employers that stimulate and engage workers in the short term may differ from those that reduce health risks of workers over decades.

Workplace Health Promotion in the United States

Since an estimated 300,000 to 500,000 deaths occur in the United States annually due to obesity and inactivity, and 400,000 due to smoking,[35] core WHP programs typically focus on physical inactivity, overweight/obesity, and smoking cessation. Many programs also address stress, mental health problems, and substance abuse; coronary artery disease, cerebrovascular disease, and hypertension; diabetes; osteoarthritis; and malignancies related to lifestyle factors, such as lung cancer.

A 2006 survey found that 62 percent of responding U.S. employers offered wellness initiatives and 15 percent planned to do so in the near future.[36] Many respondents were providing education, decision-support tools, integrated disease management, and coaching to employees.

Numerous companies and unions have developed their own WHP programs. For example, General Motors and the United Automobile Workers have collaborated on the Lifesteps program, which has involved more than 40 percent of eligible households.[37] In the 1980s, IBM offered "A Plan for Life," which featured tracking of blood pressure, serum lipids, body mass index, and cigarette smoking. A voluntary health assessment survey was coupled with courses offered either onsite or offsite with tuition assistance. One-half of the course participants stopped smoking, compared to one-third of those who did not participate in any courses.

Pitney-Bowes, notable for its emphasis on workplace design and ergonomics, has added to its occupational medicine program with full-scale primary care clinics and some specialty services at its largest sites in order to reduce medical costs, improve worker access to medical care, and improve patient compliance with prescribed medications. The company has also increased compliance by reducing requirements for use of generic drugs and by establishing parity of mental health benefits. It has dramatically reduced costs, mainly by more effective utilization.

A number of private companies have attempted to standardize WHP programs through use of a uniform checklist format, as reflected by draft standards and measures for the *Wellness & Health Promotion Product Suite* from the National Center for Quality Assurance.[38] For example, there has been widespread use of the Health Risk Assessment (HRA) to assess the health of individual workers and persuade them to alter their behaviors. The HRA consists of a questionnaire, a risk-projection calculator, and a short narrative of health recommendations.

One reason for the particular interest in WHP in U.S. workplaces is the cost of employer-sponsored plans that provide access to health care. Workers with at least three common behavioral risk factors, such as smoking, inactivity, obesity, and alcoholism, are 50 percent more likely to be absent from work than employees without equivalent risk factors.[39] However, there is much variation in how WHP programs affect worker health[40] and uncertainty about whether they reduce health-care costs over the long term. HRAs without individual health counseling or coaching generally have not led to changes in health-related behaviors.[41] A review of 42 epidemiological studies with a total of over 500,000 participating workers who were followed for an average of 3.6 years, found that, in almost half of the studies, worker absenteeism decreased by an average of 30 percent and health-care costs decreased by an average of 22 percent.[42] Other researchers have challenged the quality of studies that have evaluated WHP outcomes and argued that costs can be decreased more with targeted disease-management programs.[43] In

general, WHP programs have been more successful in sustaining smoking cessation and blood pressure control than other lifestyle changes.

Several programs have attained high participation rates by providing monetary incentives, which have ranged from $20 to complete surveys and HRA forms to several thousand dollars if health goals are met.[44] Provisions of the Health Insurance Portability and Accountability Act (HIPAA) restrict the use of health status as a determinant of incentives or penalties; incentives are legal if they are tied to physiological goals as part of an overall employee policy. Some argue that incentives are a necessary part of a successful WHP program.[45] Because participation rates in WHP programs can reflect different levels of involvement and are not a surrogate for successful changes in health behavior, measures of performance and health and/or work outcomes, such as reduced lost work time, are also important and are sometimes characterized as development or refinement of baseline WHP programs.

In general, WHP outcomes can be divided into three related categories: participation, quantitative outcome targets, and achievement of individual outcomes. Two examples are shown in Table 38-2. The setting of outcome targets is a critical means of assessing effectiveness and is highly tied to the use of incentives. Quantitative targets are based on national norms, which have been set by the NIH or consensus health organizations. They leave less to interpretation and avoid the costs of individual counseling. In contrast, if incentives are used, there is a tendency to enrich people who are fit already and to further discourage the involvement of those who are least healthy by setting unreachable goals and increasing penalties. In addition, even modest success in one lifestyle behavior is often a "gateway" change that will encourage other results. There are also more refined outcome considerations. For example, moderate overweight (BMI = 25-29), which does not increase cardiovascular disease risk without other risk factors, may be a achievable goal for obese people. In addition, people who participate in weight-loss programs who do not reach desired weight-loss outcomes are also less likely to increase their weight than non-participants. Given the difficulties in evaluating health promotion programs, some have suggested use of less formalized qualitative methods of assessment, such as focus groups and interviews.[46]

The efficacy of establishing programs in selected settings or for a short term needs to be balanced against long-term effectiveness in achieving program goals and desired outcomes. The RE-AIM list of criteria[47] can assist in setting priorities for public health interventions:

> Reach a high proportion and representative sample of employees;
> Effectiveness in achieving intended outcomes with minimal negative effects;
> Adoption by a high proportion and representative sample of workplaces;
> Implementation with fidelity to original model while minimizing unintended consequences; and
> Maintenance of program for at least 6 months.

Regarding public policy in the United States, national legislation has focused on insurance premiums. Some individual states have provided a mixture of incentives and assisted services.[48] In particular, certain states have developed cooperative programs with the Centers for Disease Control (CDC). For example, Maine and CDC have developed WHP programs on physical

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activity, nutrition, tobacco, cancer control, asthma control, cardiovascular health, diabetes prevention and control, and breast and cervical health.

Other Programmatic Initiatives

Participatory Ergonomics: *Participatory Ergonomics* (PE) programs engage teams of workers in designing work stations and in participating in other work-process interventions in ways that will directly affect their jobs.[49]. Workers can be similarly engaged in the design of WHP programs.[50] The process resembles the European "health circles," in which workers are engaged as subject-matter experts in changing organizational structure to improve physical and psychosocial working conditions, with positive impacts on employee health, well-being, and absenteeism.[51-52] A successful PE program includes:
1. Identifying problems by passive and active surveillance;
2. Identifying possible solutions;
3. Evaluating solutions and piloting and improving approaches;
4. Implementing tested solutions;
5. Evaluating effect and assessment of costs; and
6. Developing long-term sustainable programs with an iterative approach, including identification of the next problem focus, involvement of medical management, and diffusion to new departments and facilities.

Enlarging the PE program to cover WHP areas involves three steps that mirror successful occupational health and safety committees:[50]
1. Identifying key leaders or "champions;"
2. Communicating the implementation plan and projects throughout all tiers of an organization, with specific messages to different levels of management and workers; and
3. Designing and implementing of training programs customized for each level of the organization.

Different strategies are needed to engage managers and employees, because WHP is more popular among managers and more acceptable to salaried than hourly workers. However, the largest obstacle to PE programs has often been inadequate commitment by management. An effective steering committee should include all key workplace groups, including mid-level managers and supervisors, recognizing that immediate supervisors approve and arrange release time for members of a design team.[53]

Life-style and work organization options: Employers can offer flexible working arrangements in the form of part-time, casual, and telecommuting work. More proactive employers can provide compulsory leave and a strict maximum on work hours, and they can foster an environment that encourages employees not to continue working after regular work hours.

Work-life integration varies by country and by occupation. In general, only highly skilled workers have work-life benefits in their contracts, whereas unskilled workers almost always have only bare-minimum legal requirements in their contracts. Compared to the United States, the EU has gone much further in assuring work-life balance, such as with laws on parental leave and

non-discrimination against part-time workers. However, a study of companies in Great Britain found that less than 5 percent offered flexible work hours or leave policies beyond national requirements, although more than 25 percent offered stress counseling.[54]

In the United States, there is some support for parental leave. According to the Family and Medical Leave Act, any "eligible" employee is entitled to 12 weeks of leave for needs of an immediate family member (spouse, children, or parents) or medical reasons during a 12-month period.[55]

Initiatives by non-governmental organizations: The National Center for Quality Assurance (NCQA) is a non-governmental organization that has pursued national standardization of workplaces and vendors through wellness and health promotion standards. It relies on established checklists and assessment tools and has established a scoring system based on a set of universal criteria, such as engagement of employers or plan sponsors, privacy and confidentiality, encouragement of wellness and prevention, health appraisal, self-management tools, health coaching, and measurement of effectiveness. The NCQA approach begins with the presumption that, without strong management commitment and central decision-making, programs will be ineffective. It focuses on a limited set of recognized adverse health behaviors -- smoking, insufficient exercise, and overeating -- associated with the most prevalent chronic diseases. It is oriented towards large companies and organizations that can either directly provide resources or pay for services of outside vendors. It excludes most Working Life program components that involve the quality of specific work or a specific work organization.

The American Heart Association (AHA) has endorsed worksite wellness programs in order to reduce morbidity and lower health-care costs.[56] Its program includes public-access websites with PowerPoint presentations and supportive materials. Primary program components include tobacco cessation; physical activity and exercise; stress management and stress reduction; screening for hypertension, increased body mass index, hypercholesterolemia, diabetes, and mental health problems; nutrition education; weight management; and cardiovascular disease prevention.

The AHA supports the use of instruments for readiness to change and motivational assessment. Its program, which is developed for all people, regardless of age, gender, or ethnic, cultural or intellectual capacity, focuses on health behaviors -- but not working conditions.

The AHA recommends the following steps to promote cardiovascular wellness in the workplace:
- The president or chief executive officer appoints an internal wellness program coordinator or wellness promotion staff member to be available to employees for consultation.
- The employer identifies procedures and develops activation plans to handle health emergencies of employees at work.
- The employer offers training in cardiopulmonary resuscitation (CPR), first aid, and/or the use of an automatic external defibrillator (AED).
- The employer offers a confidential hotline for alcohol and other substance abuse problems.

- The worksite is defined by supportive social and physical environments that facilitate healthy lifestyle choices.

While the AHA aims to reduce heart attacks and strokes, its overall program focuses on broader behavior change of workers.

Integration of WHP with Occupational Health

Barriers to successfully integrated health promotion and disease prevention programs include the multi-factorial nature of health, the long-term evolution of chronic diseases, the greatest risks being present in lower socioeconomic groups, the long-term commitment necessary for sustainability, and job insecurity of many workers.

The Institute of Medicine proposed an integrated employee health program for NASA.[28] Its recommendations focused heavily on integration of worksite health promotion and occupational health and safety service delivery and incentives.

There is a potential contradiction in WHP programs, because of the differing nature of individualized and group-based programs. Successful community-based health programs that advance behavior change emphasize individual responsibility, but also group and individual involvement in setting goals and implementing programs. The external imposition of goals and incentives, even if implemented at the individual level, represents a variation of this approach, with less established outcomes. The integration of occupational health and safety with health promotion as part of the Working Life concept should represent an effort to increase the level of ownership and control of health programs by the active workforce.

One of the most comprehensive analyses of the Working Life concept emerged from the Robert Wood Johnson Foundation's Commission to Build a Healthier America.[57] The report noted the importance of health status to secure employment, the greater impacts of health problems on workers of lower socioeconomic status (SES), and the highly adverse health effects of job loss. It addressed the conventional occupational health focus on the physical conditions of work, as well as the psychosocial aspects and the organization of work. The report provided a work-centered perspective on health that differs from conventional WHP and individual behavioral profiles. Key issues included:

1. Work schedules: Important considerations include shift work, overtime work, and the time consequences of holding multiple jobs. Sleep deprivation and impacts on family relations are key themes. The flexible hours and telecommuting of higher-paid employees are different than the time needs of low-SES workers.
2. Commuting: Out of 134 million U.S. workers outside the home, 120 million commute to work. Time duration of commuting is directly related to low back pain, reduced leisure exercise, and obesity.
3. Work-life balance: Since 1970, family work time has increased by 11 hours. The report recommended flextime, schedule variation, and breastfeeding policies.
4. Control at work, demands and decision latitude: The Commission paid heed to the effort-reward and strain models of chronic disease, noting that employees at different

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organizational levels have marked disparities in opportunities for skill utilization and self-efficacy, which may explain much of the SES difference in health status. This was extended into the concept of "organizational justice."

The report also addressed racial and gender discrimination, the need for a supportive work environment, income and other work-related resources, leave time, elder care responsibilities, and health insurance. (See Figure 38-2.)

In 2004, NIOSH launched the WorkLife Initiative (WLI), which seeks to establish effective workplace programs to sustain and improve worker health.[58] It focuses on identifying and supporting comprehensive approaches to reduce workplace hazards and promote worker health and well-being. The premise of this initiative is that comprehensive practices and policies that consider both the physical work environment and the organizational work environment, while also addressing personal health risks of individuals, are more effective in preventing disease and promoting health and safety than each approach taken separately. Another key goal is overcoming the many translational issues that now prevent state-of-the-art research findings on occupational health and safety, health promotion, and chronic disease prevention from promptly benefiting workers -- regardless of workplace size, work sector, or region. The WLI also recognizes the need to develop a culture of work-life balance. Specific recommendations on program content and policies are available at http://www.cdc.gov/niosh/worklife/essentials.html.

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Table 38-1: Some of the differences between traditional and integrated approaches to employee health and safety.

Program Theme	Traditional Measures	Integrated Work Life
Hazard control	Unitary performance standards	Accommodation to age, gender, and anthropometry
Productivity	Absenteeism, workers' compensation costs	Performance, well-being
Implementation	Problem-focused, solution-driven measures	Iterative, participatory
Cost metrics	Medical costs	Economic outcomes
Health care model	Treatment focused/group health	Prevention/behavior focus
Medical model	Occurrence of individual diseases	Group risks
Health metrics	Morbidity and costs	Positive health markers
Interventions	Single-risk focused	Multiple-risk focused
Management systems	Segregated programs	Integrated programs

(Source: Institute of Medicine, 2005)

Table 38-2: Illustrative Examples of WHP Outcomes

	Participation	Quantitative outcome target	Achievement of individual outcomes
Weight loss	Completing Health Risk Assessment Attending weight-loss group	BMI <25	10% decrease in baseline weight
Physical activity	Completing Health Risk Assessment Purchasing gym membership	150 minutes per week	Walking program

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Work-based strategies to improve health
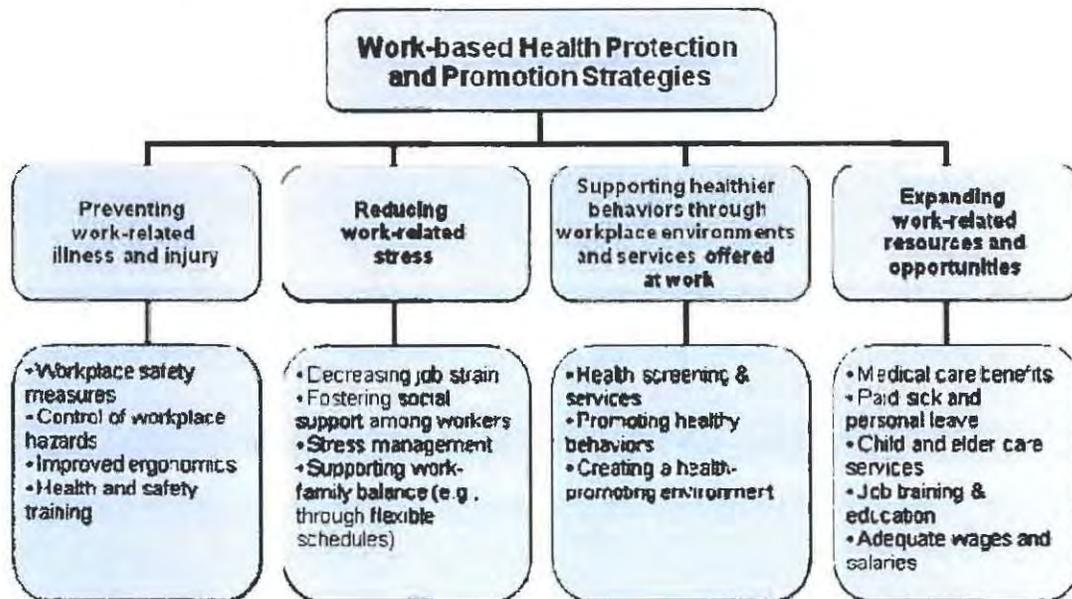
Figure 38-2: Work-based strategies to improve health

(Source: Robert Wood Johnson report.)

Figure 38-1. Working Life and the Productivity Argument
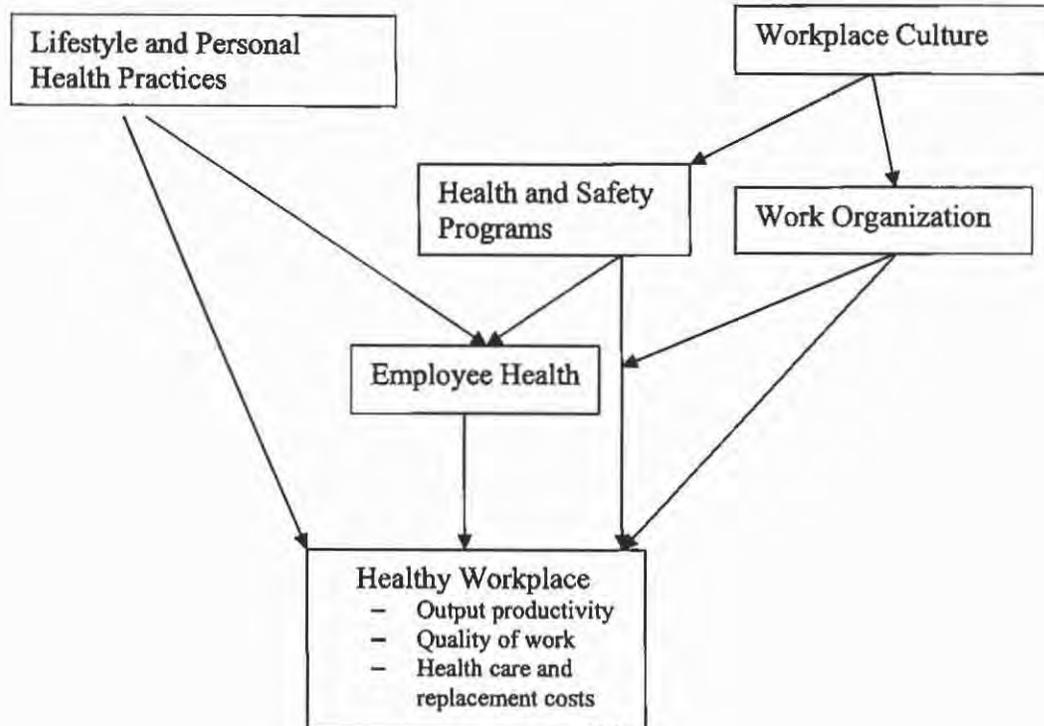
Editorial Manager(tm) for Health Promotion Practice
Manuscript Draft

Manuscript Number:

Title: Health Promotion Site Selection Blues: Why did things go wrong when it was done so right?

Article Type: Peer Review Article

Section/Category:

Keywords: worksite health promotion, participatory, ergonomics

Corresponding Author: Dr. Martin Cherniack, M.D., MPH

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Manuscript Region of Origin:

Abstract: Purpose: Companies were recruited for an intervention study comparing different approaches to integrating health promotion with occupational health and safety.
Design: More than 1200 national accounts were reduced to 14 "most ready" companies, 4 being selected as priority sites. A follow-up study was directed towards highly ranked companies that decided against participation.
Setting: A major insurance carrier assisted with a structured and hierarchical site selection of its clients.
Subjects: Eight public and 6 private companies were selected as most likely to participate. Their work forces varied between 950 and 64,000 employees.

Measures and Analysis: Selection criteria included use of a 21-item checklist that included measures of health care burden and costs, financial exposure to risk, confidentiality protections, flexibility for employee participation, and organizational readiness.

Results: At all four priority sites, senior management decided against participation. Surveyed negatives included employee time, participatory involvement, anticipated lay-offs and cost constraints, and potential new program costs.

Conclusion: A highly structured insurance-driven process for determining corporate readiness for participatory health promotion produced contradictory results.

To: The Editor
        Health Promotion Practice

From: Martin Cherniack, MD, MPH
        Professor of Medicine
        University of Connecticut Health Center

Re: Submission of Manuscript

Dear Editor:

We are submitting for your review a manuscript, *Health Promotion Site Selection Blues: Why did things go wrong when it was done so right?* It describes methodology used to identify a handful of American companies that were culturally most likely to take part in a study of health promotion and workplace health related interventions that would be designed through active participation of the workforce. The approach, which was partnered with a major national workplace insurer, proved to be notably unsuccessful. The complex selection process and its feedbacks and a later follow-up study to understand reasons for non-participation are explored in the manuscript. Hence, the elliptical title.

We thought that *Health Promotion Practice* would be interested because of the integration of academic investigators with insurance company risk control and case workers, and with health and safety personnel at the plant level. The paper also explores our best understanding of practical barriers to workplace programs based on empowerment and participation, and suggests mechanisms for more successful future approaches.

We hope that you share our interest in this particular orientation towards working age populations.

Health Promotion Site Selection Blues: Why did things go wrong when it was done so right?

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Introduction

The Center for Promoting Health in the New England Workplace (CPH-NEW) is a federally funded research and outreach intervention center, tasked with integrating workplace health promotion (WHP) with occupational health and safety (OH&S). Initial interventions have had a musculoskeletal focus (Cherniack et al., 2008). A core project, Health Improvement through Training and Employee Control *(HITEC)*, compares professionally administered WHP and ergonomics program with a program designed and developed by the workforce with assistance from professionals. *HITEC's* premise is that linking WHP and workplace OH&S programs will positively affect individual health and the work environment, and will be measurable by variables reflecting health status and program costs. A key feature of *HITEC* is the supplementation of survey-based assessment with direct measurement of change in both the individual and in the work environment. Quantification of physiological change work processes are expected to detect change before long- term endpoints, such as injury or disability, can be recognized. A second goal of *HITEC* is the collection of integrated health care data that can be evaluated through economic metrics. A third goal, shared by all CPH-NEW projects, is primary reliance on participatory structures.

Because project objectives involve reallocation of healthcare resources, such as cost-shifting towards prevention, the study was jointly developed with a major North American worker's compensation and liability insurer. Candidate companies from the insurer's national accounts were targeted for the following reasons: claims managers and risk control specialists knew management policies and company safety and health cultures; they had data bases on the nature, frequency and severity of workplace injury;

and the insurer's interest in eventual commercial implementation provided a novel platform for research to practice conversion, and rate structure revision. The participation of workforce, management, study team and insurer, while requiring special protections for corporate and participant confidentiality, also offered a representative participatory format for incentivizing workplace change.

A complex and multi-level site selection process, described below, began in the late spring of 2006, and continues. What was conceived as a sophisticated best practices selection process, geared at companies most motivated towards this type of participatory intervention, met with surprising patterns of resistance from upper management in late stages. The process and the reasons for resistance, explored below in a post-hoc analysis, follow.

The Logic for Participatory Programs

The premise of HITEC is that the linking of WHP and OH&S programs will positively affect individual health and the work environment, that objective and subtle measures of health status and program costs are both necessary and possible, and that outcomes may differ between participatory and top-down programs. The last of these points, the centrality of participation merits introductory explanation. Koelen and Lundstrom (2005) observed that even when a management is supportive and has an avowed organizational commitment, effective change in behavior will be compromised in the absence of worker control over both personal circumstances and the physical environment. Construed under the general classification of empowerment, these participatory concepts include both psychological and social elements. The more individualized psychological categories include recognition of associations between

individual behavior and outcomes or *health locus of control* (Wallston et al., 1976; Wallston, 1991), and recognition that specific actions produce intended outcomes, or *perceived self-efficacy* (Schwarzer and Fuchs, 1996). The ability to act on the environment to prevent personal harm has a specific cast in the workplace, where external demands, control of time, and adaptability are influenced, if not determined, by organization at the worksite level (Laverack and Wallerstein, 2001).

The interest in participatory groups reflects experiences from what has been called community-based participatory research (CBPR) (Krieger et al., 2002; Israel et al., 1998), and the work of labor and management joint health and safety committees (Ochner and Greenberg, 1998; Eaton and Nocerino, 2000). Some issues that complicate translational research generally, such as context and external validity (Glasgow and Emmons, 2007), are especially relevant in the work environment, where economic constraints and essential differences in economic security and autonomy are structural and essential.

In addition to more customary CPBR activities, such as in data collection, and intervention development and evaluation, the participatory process was intended to create new sustainable administrative structures. The psychosocial conditions of work, such as decision latitude and supervisor and co-worker support, are mediators of psychosocial strain affecting mental, cardiovascular, and musculoskeletal health, and programs empowering participant decision-making over workplace factors that affect mental or physical health can reduce psychosocial strain and its negative health consequences (Vezina et al., 2004). Gunnarsdottir and Bjornsdottir (2003) argue that changes in work organization that increase workers' autonomy and decision-making ("job control") can

improve health in and of themselves, by promoting creativity and recognition or reward

for good work, providing consistent and constructive feedback, enhancing interpersonal

workplace relationships, and structuring healthier schedules. Multiple health indicators

have improved following a health-motivated, multi-faceted, program that promotes

institutional change (Anderzen and Arnetz, 2005). A recent review summarized the

potential health benefits of organizational interventions with increased worker

participation in decision-making, including better communication, improved support and

feedback (Michie and Williams, 2003).

Methods

Design of the HITEC Project and Implications for Site selection.

In order to compare a more traditional site with an experimental participatory site,

several selection criteria were essential. These included the following:

- At least 2 sites per employer, so that that the matched interventions would occur at parallel and non-contaminated locations.
- Sites that were sufficiently large and stable (>300 employees) so that there would be at least 150 participating employees per employer per intervention arm, assuming a combined participation and turnover rate of 50%..
- Locations compatible with the study travel budget and logistics
- A roughly equal gender distribution, within broad job title categories, i.e., clerical and production
- Agreement to provide group health information with personal identification protections
- Availability during working hours for WHP and OH&S activities
- Evidence that both sites could benefit from an intervention

Basic selection occurred at the insurer's seven regional offices and final lists were

assembled by a senior executive group with representatives from medical, accounts, and

risk control. An enlarged steering committee consisting of the study team and regional

and national staff from the insurer made final choices. Selection instruments were

developed by a joint university and insurer study team. The selection process is

presented in Figure 1, and is further described below.

Site Selection

A site solicitation worksheet was sent out from each of the insurer's regional offices to key known client health and safety personnel to gauge general interest. Responses were not definitive of status but were a secondary weighting tool used for quantitative assessment. In a parallel process, risk control screened the national accounts list of approximately 1200 companies by two criteria: 1) sufficient plant size for study power, and 2) sufficient worker's compensation claims activity. Using this information, each regional accounts group was advised to develop a list of 7-8 most amenable companies.

The next phase of selection was based on a 21-item check list, developed as an adjunctive tool to rank the most amenable companies. The checklist (see Table 1) was a key variables list based on common data fields for national accounts and further interviews with representatives from accounts, medical, risk control and underwriting. Before application, the checklist was reviewed and refined by the senior executive group. It included 6 domains: 1) company characteristics (4 items), 2) health care costs and severity of disease and injury (4 items); 3) insurance domains such as data transparency and availability, insurer stability, and level of financial exposure (5 items); 4) confidentiality and privacy for employees (2 items) ; 5) employee time flexibility for on-site participation (3 items); and 6) workplace culture and openness to change.

The checklist incorporated cell-index factors (1-5 scale) and weighting factors (1-10). The weighting process followed the "trade-off model", suggested by Chapanis (1996). Multiple combinations of weights were tested to verify that ranking would not change from any modest variations in weights and cell-index factors. The reason was to

stabilize across item weights while allowing for full flexibility in the assignment of cell-index factors regionally. Regional accounts executives were encouraged to conduct further sensitivity analyses to assure the rank stability, but it was understood that they would likely rely on a recommended weighting system. A possible top score was 605; the actual range was 341-513.

With application of the checklist, 50 companies that had been selected for detailed review required reduction to 12-14 companies. Fourteen companies were defined as "most ready"; eight were public companies and 6 were private. They ranged in size from 950 to 65,400 employees. A 4-part screen was then applied by the senior executive group foe further reduction.

1. Stability of the insurance contract for they study duration
2. Existence of a functioning health and safety committee
3. Labor-management relations that were non-adversarial; and no current or impending lay-offs
4. A company culture amenable to workforce participation and working with the insurer and study team.

The underwriter then reviewed each account to confirm that the company carried sufficient direct (non-insured) risk so that successful interventions would provide direct cost savings. In a final session, the regional account executives and the broad steering committee met to choose 4 companies—two initial choices and two back-ups.

Customized Approach to the 2 Target Companies

The targeted companies were approached with preliminary focused discussions between the account executive, insurance broker, and management representatives from health and safety and human relations. Prepared materials consisted of power point presentations; dossiers on company worker's compensation costs and severity of injury and disease; and background materials on health trends, and the economics of early

intervention. There was a detailed timetable for probable time allocations on the part of employees and management. The structure of design teams and experience-based problem scenarios were provided to explain participatory processes. Preliminary efforts were also made to outline architecture for an integrated data base for group health, worker's compensation, and disability management. Presentations stressed flexibility and opportunities for site specific modifications, adopting research-to-practice themes advocated by Glasgow and Emmons (2007).

There was considerable elaboration of the difference between the participatory site and the matched 'professional' site or 'traditional site'. While exposure assessment, personal testing, questionnaire administration and the approach to integrated health data were identical for both study arms, the professional site was designed around a more conventional approach to WHP with an orientation towards musculoskeletal health, personal behavior change, and performance optimization. The ergonomic program was additive. The HITEC approach assumed that existing WHP programs with their HRAs, incentives, and use of outside vendors would continue with additional emphases on aging, musculoskeletal health, and increasing participation and sustainability. Other additions were recommendations on ergonomics and organizational culture, and enhanced quantitative assessment. Where a basic WHP program was lacking, the plan was to introduce a best practices commercial program.

The participatory site had a different emphasis with an extensive upfront investment in developing internal design teams. It was based participatory ergonomics (PE), drawing from the experience of the study team, and using empowerment models that draw from small group formats. The suggested model was a **joint worker-**

management facility team, growing from an established health and safety committee or worklife team. The suggested representation was 1) at least 50% workforce representing various job functions and levels of responsibility; 2) safety/health/medical personnel; 3) human resources; 4) a representative with fiscal authority; and 5) a member of senior management. The **joint worker-management facility team** was expected establish smaller **design teams** organized by related work areas and/or job functions, using a sociogram approach to identify workplace opinion leaders. These design teams would have initial training on musculoskeletal health issues, and would independently develop priorities and approaches for prevention/intervention. A facilitator from the study team would assist. The study team would also be available to assist in a formal implementation plan following a needs assessment, but final logistics would belong to the joint worker-management facility team, pending fiscal and managerial review. The joint worker-management facility team would suggest additional evaluation mechanisms and site and job-specific measurable goals, beyond core study measures. Effectiveness of the group process would be assessed by an expert in qualitative methods.

Because of anticipated concerns about conflicts with collective bargaining or policy constraints, such as mandated safety or work rules, and because of concerns that joint worker-management teams might recommend non-feasible structural changes, presentations to management emphasized a gradual approach, stipulating that final decisions on implementation would rest with senior management. A proposed decision tree is demonstrated in Figure 3.

Results

Follow-up on Failure to Engage

After lengthy preparation and strong enthusiasm from health and safety personnel, employee relations and brokers,each of the priority sites elected not to participate. The reasons for management resistance, when stated of interest was high and WHP was an organizational goal, was the object of further evaluation. Companies were assessed in two ways: 1) qualitatively by formal debriefing with key insurer personnel, especially the account managers, and 2) quantitatively by distribution of a follow-up survey to key company personnel. Reasons for resistance observed by the insurance carrier are grouped below in Table 2. They are simply listed; there is no attempt to rate or prioritize items.

The two highest ranked employers participated in an interview administered follow-up survey conducted by insurer representatives. Employers responded to an extensive survey, with queries grouped by insurance/cost considerations, confidentiality, internal acceptance, logistical issues, work culture, project content, and costs. They were asked to rate the issues from strongly positive to strongly negative in relation study involvement, and then to rate the extent of the impact on the decision not to participate (no influence, moderate influence, major influence). Results are presented in Table 3. One employer did not list any of the items as "strongly positive". For the other employer, the items that were rated as both **strongly positive** and **having a strong influence on the decision** were:

- Current volume and costs of group health claims
- Considering a change in group health carrier

The current volume of costs of workers compensation claims was rated as "moderately positive" and a major positive influence by one company. In response to an open ended question, the main *advantages* described by the two companies were cost

reductions, wellness and workers compensation improvements, and reduced employee turnover. The main *disadvantages* were time and cost of participation.

Discussion

Leaving aside idiosyncrasy, the resistance encountered by HITEC may indicate general problems facing integrated WHP. There were differences between stated organizational readiness and acceptance from health and safety and human relations personnel as opposed to views of senior managers, line supervisors, and legal departments. Consequences are not circumstantial. Even if introduced independently from OH&S and organizational interventions, the core interventions of WHP – lifestyle change, early disease detection, improvements in mental health, and sometimes improvements in quality of life and services – inhabit a middle ground between policy recommendations and purely personal action, and presumes some personal empowerment.

Rejection of this experimental WHP program does not cast its shadow fully on more traditional programs. The structured intrusion from the insurer and the investigative team infringed on management prerogatives, threatening dissemination of results. Nevertheless, the two key features of HITEC – integration of WHP with OH&S, and direct workforce involvement in program selection and development – carry little threat of adverse public exposure.

None of this obviates integration. The worksite can be a channel for the delivery of interventions designed to reduce chronic disease among adult populations (Abrams et al., 1994; Glasgow et al., 1995). However, conventional WHP, absent interventions in workplace organization and OH&S, often seems to plateau. A review of 316 studies that

evaluated WHP programs found positive results for weight control; borderline positive results for nutrition, exercise and cholesterol management; and weak results for health risk appraisals (Glasgow et al., 1993). Detailed analyses of intervention components show equivocal success in changing lifestyle characteristics such as dietary habits or physical activity (Dishman et al., 1996; Glanz et al., 1998; Heaney and Goetzel, 1997). Problematic outcomes from broad-based WHP resemble workplace back injury prevention. When limited to lifting training (as opposed to ergonomic interventions), benefits are short-term (Karjalainen et al., 2001; Koopman et al., 2004). Sustainability is another concern for WHP programs (Booth et al., 2001). There is a recognized disparity between the willingness of many workers to accept health and safety activities directed at workplace hazards and their acceptance of employer sponsored health promotion activities (Aldana and Pronk, 2001). The workplace has situational conflicts and barriers, whose resolution requires novel institutional solutions (Melhorn and Gardner, 2004).

Difficulties with Participatory Programs

Other investigators have noted particular barriers with participatory programs. Harden et al. (1999) in their review of WHP programs in the United Kingdom observed that actual work environment interventions were rare; although many programs cited participatory interventions through mechanisms like wellness coordinating committees, evidence that these were well developed was largely absent. Only about 20% of companies enlisted the workforce in program development or in program evaluation. Health targets were invariable set by epidemiologic criteria rather than by solicitation. In a study of Irish workplaces adopting the *'Healthy Heart at Work'* program, a well organized and accepted program that relied on interviews, phone follow-up and focus

groups failed to meet its own benchmarks for independence and sustainability (McMahon et al., 2002). Thus, it is an open question whether program adaptability, which has been cited as the key issue separating evidence of effectiveness from practice, can be facilely introduced into the workplace (Glasgow et al., 2003).

There also appears to be a gap between often exemplary participatory programs in OH&S and their extension to individual health-related activities. Describing WHP in Finland and Sweden, Johansson and Partanen (2003) noted the central role of labor organization in traditional workplace OH&S, but also the defensiveness of contemporary labor organizations towards WHP given loss of economic and political power. Urlings et al. (1990) noted that an effective behavioral model required assessment of management's readiness to change, as well as awareness of the workforce. The participatory approach has had a long accepted place in workplace ergonomics (Haines and McAtemney, 1995; Wells et al., 2003). However, as Haslam notes (2002), when behavior change is introduced as a substitute for physical change, participatory programs will often resist. Their cautionary conclusions are drawn from team directed ergonomics. Insufficient time, competing work demand, ergonomic need, lack of organizational support, and sustainability compromise these acknowledged benchmarks of workplace participoation (Bohr et al., 1996; Hignett et al., 2005; Moore and Garg, 1997).

HITEC company recruitment underscores a generic problem with acceptance of participatory programs. Even in community participatory models for behavior change (Abrams et al., 1990), the most effective interventions involving diet, exercise and smoking cessation have had restrictive and episodic participation. The challenge for workplace investigators is to better identify barriers and develop convincing formats even

when full program outlines remain unclear. It seems likely that a multi-media and multi-level approach will be necessary. Another need is for better tools to address organizational readiness so that a tailored strategy can be developed. Landsbergis (2003) noted the interplay of organizational and individual factors in the modern workplace in his call for the professionalization of organizational research. His examples are the changing demographics and time and benefits requirements of an increasingly female workforce, and lean or more flexible work organization, which while offering more latitude in work content, also increases job strain by circumscribing decision making authority. He cites Fisher and Belkic (2003) that the most aggressive individually-based cardiovascular disease interventions have yielded few improvements when exposure to stressful workplace structural factors, in this case in municipal transportation, were unattended. The present study suggests barriers that inhibit employers from committing to large-scale and/or long-term health promotion intervention projects, even when subsidized by a federal grant and even despite deep concerns over group health and workers' compensation costs and workforce aging. While some barriers identified by HITEC may have been more related to research issues than the interventions, i.e., independent publication of results and time filling out surveys, other barriers were more generic, i.e, time for participatory teams, and ergonomic interventions. What appears to be needed is a clearer articulation of benefits versus costs of highest value interventions, and of how to manage organizational change in relation to WHP. The structural issues of rising health care costs and the aging workforce are in any case going to increase the foreseeable future.

A Preventive Approach

Although alterations in rate structure are sometimes posed as essential to prevention, programs introduced by insurance providers may be resisted. The insurer's role in addressing worker health problems typically appears compensatory rather than preventive. Preventive consultation and organizational candor may be restrained by periodic re-entry into the open insurance market. A more positive business case for participatory WHP programs may be required given the limited impact of worker's compensation costs on total health care cost burden. As an example, the proposed experimental participatory WHP approach can be rationalized as an extension of established total quality management (TQM) practices. Worker health is construed as an "upstream" factor that requires management oversight, thus mimicking Demming's pioneering recommendation that the quality of upstream materials be carefully managed to assure quality in production processes. By this model, the limited compensatory focus of conventional OH&S can never adequately address individual health variation. Management may therefore be more willing to adopt an experimental WHP program that engages small teams of workers in health promotion, consistent with the quality circles in TQM. Small teams in quality circles are empowered to identify sources of variance in quality, and then propose and test solutions for control, often requiring changes in work organization. Participatory ergonomics, a core approach of the present experimental WHP program, evolved from quality circles when their scope was expanded to include worker training on applying basic ergonomics principles to improving work processes.

Conclusion:

A highly structured insurance-driven process for determining corporate readiness for participatory health promotion produced contradictory results, suggesting the inability

of some management divisions to embrace a novel integration of OH&S and worker involvement.

Epitaph: Other Approaches to Recruitment

The description of barriers encountered by HITEC in its structured recruitment is meant to be illustrative; it does not foreclose the effectiveness of a different approach. In fact, there is a happy ending, as HITEC has engaged committed company partners in both the private and public sectors. These agreements have been more the result of personal and professional reputation and relationships, where there has been a history of joint-labor management committee structure around ergonomics and health and safety, and where there is experience with the benefits and limitations of conventional WHP. The story is interesting, but different.

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Figure 1. Selection Process

Regional Accounts

3b Screening of 1200 National Accounts

Risk Control

4 50 Sanitized Basic Documents

3a Additional Risk Checklist

Executive Group

2 Completed Checklist for Mapping

Underwriter Review

5 15 Company Short Lists

6 Setting of Price List for Insurance Plans

Study Team

1 Development of Checklist

Combined Steering Committee

7 Risk Direction

2 preferred and 2 second choices

Figure 2. Proposed Structure of Design Team

UConn Consultation and Group Facilitation

Other Information Resources

Design Team

Steering Committee

Management

Implementation

1

Table

DOMAIN	ITEM	DESCRIPTION	WT
PHYSICAL CHARACTERISTICS = 4	Company Size	≥2 sites @ >150 employees per site	2
	Company Characteristics	Mixed salaried and hourly workforce/varied job tasks	2
	Facility Location	Drive and return to sites within 1-day	6
	Site Independence	Site sufficient for content independence	8
HEALTH CARE COSTS AND SEVERITY = 4	Health Care Costs	Premiums and costs near sector norm	10
	Health Care Burden	Incidence and prevalence at sector norm	5
	Job Injury and Illness Rates	Rates at sector norm (≤1SD from mean)	5
	Serious Medical Conditions	Confidential consult on serious health problems	6
INSURANCE CHARACTERISTICS = 5	Stability of Insurance	WC insurer stable for 5 year study	2
	Group Health Data Availability	Available de-identified group health data	8
	Work Comp Data Availability	Availabile of worker's comp data	8
	Loss Sensitive Account	Potential for direct cost savings	7
	Record Transparency	Availability of health records for analysis	4
CONFIDENTIALITY MAINTENANCE = 2	Confidentiality Maintenance	Identified data restricted to study PI	3
	Restricted Use of Health Info	New data excluded from non-study use	4
FLEXIBILITY FOR PARTICIPANTS = 3	On-site Work-Time Allocation	Provide onsite time for annual survey	5
	On-site Exposure Evaluation	Worker available exposure monitoring	4
	Participatory Process Time	Onsite time for design teams	8
WORKPLACE CULTURE = 3	Accommodation to Change	Openness to change	10
	Adherence to Study Terms	Willingness to accept intervention	10
	Active Safety Committee	Joint labor/management activity	5

Table 1. Explanation of Screening Criteria

1

Table 2. Reasons for non-Participation Cited by Insurer
- Time and resource demands
    - o Release time for employees for study participation
    - o Time demands on a middle management already running lean
    - o Expectation that employee sponsored initiatives would lead to more costly incentives
- Legal and administrative concerns
    - o Documentation of exposure related health problems would be used in collective bargaining
    - o Study findings would be discoverable and might lead to legal liability
    - o Management would be legally captive to joint labor-management recommendations
- Business climate concerns
    - o Difficult economic conditions lowered the priority for study participation
    - o Expected reductions in management personnel would compromise continuity
    - o Insufficient resources to implement structural changes
- Insurance issues
    - o Discovery of unrecognized hazards would increase insurance premiums
    - o Resources were already committed to insurers and vendors and ergonomics and health promotion programs
    - o Exposure to non-insured potential costs to small to justify extensive interventions
- Efficacy
    - o Concern with negative results, given time and efforts
    - o Worksite Health Promotion already in place without clear cut further advantages
- Company culture
    - o Philosophy that it is more cost-effective to be an industry follower rather than a leader
    - o Threat to traditional corporate anonymity
    - o Concern with adverse publicity by a government agency (NIOSH)

Table 3. Reasons Cited by Employer for non-Participation
The factors that were rated as **both "strongly negative" and also a major influence** in the decision not to participate by **both** employers were:
- Publicity or public exposure of the company
- Anticipating lay-offs or other major personnel changes
- Interference in normal routines from onsite study team
- The four-year duration of the study
- Time required for participation in health promotion activities
- Time required at participatory site
- Interruptions in production and sales
- Possible costs for instituting health promotion
- Possible costs for ergonomic and work design change
- Unseen or unrecognized costs

Additional negative factors that were rated as both strongly negative and a major influence by *just one* of the companies were:
- Access of insurer to group health and disability records
- Access of study team to group health and disability records
- Other concerns with privacy of company decision making
- Concerns from the health and safety staff
- Time required for on-site questionnaires and testing
- Time required by management personnel
- Time required by health and safety personnel
- Time required by production supervisors
- Current business climate
- Risk of alarming workforce on health risks
- Employees unlikely to take part in sufficient numbers

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WORKPLACE INTERVENTIONS AND CHANGING PATTERNS OF CARDIOVASCULAR DISEASE

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Short running head: Workplace interventions and changing patterns of cardiovascular

disease

Key words: cardiovascular disease, workplace, occupational health, cardio-toxins,

"psychosocial environment", intervention studies

Abbreviations:

BMI	Basal Metabolic Index
CEA	Cost Effectiveness Analysis
COs	Correctional Officers
CPH-NEW	Center for the Promotion of Health in the New England Workplace
CUA	Cost Utility Analysis
CVD	Cardiovascular Disease
DALY	Disability Adjusted Life Years
EAPs	Employee Assistance Professionals
EU	European Union
HITEC	Health Improvement through Employee Training and Control
HRA	Health Risk Assessment
HWE	Healthy Worker Effect
ICD	International Classification of Diseases
IHD	Ischemic Heart Disease
JCQ	Job Content Questionnaire
MDPH	Massachusetts Department of Public Health
MSH	musculoskeletal health
NIOSH	National Institute for Occupational Safety and Health
OECD	Organization for Economic Co-operation and Development
SMR	Standardized Mortality Ratio
UCONN	University of Connecticut
UML	University of Massachusetts Lowell
WHO	World Health Organization
YLL	Years of Life Lost

Outline of section headers

Total paper word count: 8,600

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ABSTRACT

Introduction

Traditionally, cardiovascular disease (CVD) has been a secondary object of emphasis in workplace-based exposure studies. Reasons include the rarity of "pure" environmental cardio-toxins, assumptions relating to the Healthy Worker Effect (HWE), and wariness towards macro-social risks that appear tied to socioeconomic development. An evolving "psychosocial environment" approach to CVD has focused on contribution of job control and other risk factors to social variations in CVD incidence. Intervention targets include organizational climate, overtime or shiftwork, interference between work and family responsibilities, emotional labor, racial or gender discrimination, and violence at work.

Estimating the Level of Risk

International comparisons of CVD mortality do show that the concentration of risk follows the distribution of national income and its segregations of wealth, education, and income, and show, therefore that no model can fully disentangle risk attribution. However, in developing industrial economies, the contribution of CVD to disability and death in prime working years exceeds that in the wealthiest countries, and the CVD mortality gradient that works against manual workers is resilient across national boundaries.

Designing Interventions in the Macro-social Context – CPH-NEW

Our current workplace intervention studies in the United States (Center for the Promotion of Health in the New England Workplace – CPH-NEW), adds to the "psychosocial environment" approach with attention to the physical environment and workplace design ("macro-ergonomics") measuring interventions in physiological and

quantitative terms. Current intervention populations include nursing home workers and correctional officers. Outreach programs are directed to cardiologists and Employee Assistance Program staff.

INTRODUCTION

In industrialized countries, the influence of the workplace, or more generically of the composite elements of working life on cardio-vascular and other chronic diseases, has influenced several major currents in occupational health research. Social and behavioral factors – income, mobility, educational level, work and family inter-relationships – have been particularly emphasized, along with work organization and mismatch between rewards and demands. Two major architects of research in the work and cardiovascular disease field have coined a term, 'psychosocial environmental', to capture this relationship between organizational work environment and "needs of well being, productivity and positive self experience", that accent development of chronic disease. (Siegrist et al. 2004).

The Center for Promotion of Health in the New England Workplace (CPH-NEW) is one of two new American research centers funded by the National Institute for Occupational Safety and Health (NIOSH) in 2006. Its mandate is to develop and evaluate interventions that will integrate the more traditional occupational health emphasis on environmental and physical exposure with worksite based health promotion and disease prevention through social and behavioral approaches (Figure 1). It is based on the premise that the linking of health promotion and workplace health and safety programs will positively affect individual health and the work environment and that those effects can be objectively measured in terms of health status and program costs. While much of the emphasis is on musculoskeletal health (MSH), there is an implicit recognition of the relationship between the integrity of the musculoskeletal and cardiovascular systems (Bernaards et al. 2007; Lund et al. 2006). The center's *Education, Translation,*

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Communication, and Dissemination Project is specifically directed to public health and medical practitioners to inform them on the relationship between workplace factors and job stress and cardiovascular disease and stroke (Table 1). Furthermore, one of the cohorts under study, correctional officers and corrections healthcare staff in the United States prison system, have been the object of study because of imputed high stress and elevated quantitative cardiovascular risk factors (Harenstam et al.1988; Philliber 1987). This integration of contextual and life history factors as critical components of workplace disease is not, however, without controversy and presents particular challenges to many occupational health investigators. In general terms, concerns with workplace organization and equity and with the effects of the work environment on premature expression of chronic disease are rather mainstream interests for current occupational health researchers, labor representatives and policy makers. In particular, cardiovascular disease and mortality in early retirement are native concerns of work stress and hazard pay compensation. Nevertheless CVD has been a secondary object of emphasis in most workplace-based exposure cohort studies. There are six evident reasons: 1) CVD is so prevalent in the general population that more distant or widespread causes (e.g., societal discrimination based on race or gender, environmental noise) are more difficult to recognize through epidemiologic study than more immediate risk factors; 2) exposure to chemical cardio-toxins (TNT, Hg) is relatively uncommon and plays a small attributive role in CVD; 3) SMRs for CVD in large occupational cohort studies are presumed to show a cardio-selective 'healthy worker effect' (HWE); 4) variegate regional patterns of CVD pathology may dilute any hazard-specific equivalence of toxic workplace exposures; 5) there is limited acceptance of CVD in worker compensation systems, even

for stress-related attribution; and 6) macro-social risk attribution to factors involving national wealth and workplace culture tend to elude specific interventions. These critical concerns inform our discussion of workplace intervention research broadly, and initiatives underway within CPH-NEW, specifically.

INTERNATIONAL DIFFERENCES IN CVD MORTALITY AND THE PROBLEM OF EQUITY

Where "validated" health status and quality of life surveys are applied, they show large differences in disease patterns among regional groupings. This is true for economically and demographically congruent regions, such as is compiled by the World Bank and WHO (Yusuf et al. 2001), and between comparable countries within regions. (Graziano 2005). The complexity of the relationship between proportional mortality and outcomes indicators of CVD, such as Years of Life Lost (YLL) and Disability Adjusted Life Years (DALY), is captured in Figure 2. In developed European countries, here represented by Italy and Sweden, and in the United States, cardiovascular disease accounts for 15-25% of all deaths, which represents an increasing proportion of deaths in the context of an overall declining age-adjusted CVD mortality rate. In low and middle income countries, here represented by Brazil, Indonesia, China, and Turkey, the proportion of mortality due to CVD may crudely resemble more developed countries, but must be weighed in the context of adjusted CVD mortality rates that are 2-3 times higher, thus contradicting the appearance of parity in CVD mortality proportions. The observation that a higher percentage of YLL occurs in more technically advanced countries has a reciprocal meaning: in less developed economies, lower life expectancy and competing causes of early death are the source of this relative non-congruence. As Graziano (Graziano 2007)

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has noted, between high and lower income countries, the causes of CVD differ in significant ways, with the latter societies having greater actual and proportional mortality in the <60 year age group. These include factors that are less common in industrialized countries: the residua of heart disease from infection and malnutrition, higher rates of smoking and consumption of dietary fats, and poorer access to specialized treatment. These relationships are perhaps better characterized in Figure 3. In the richer industrial countries, more than 80% of mortality from CVD occurs after the age of 60, while death in prime working years is considerably more prevalent in lower and middle income countries. Accordingly, the years of life spent with a CVD related disability in less wealthy countries is higher than in the more technically developed states. Except for South Africa, where mortality in the <60 year age group is over 50%, the impact of cardiovascular adjusted disability follows general patterns of national wealth. International comparisons between the broadest categories of disease and the broadest strata of age are necessarily descriptive and, possibly, ecological. The next level of specific comparison includes countries having comparable income levels, where major employment classifications can be assessed between strata. Kunst and the EU Working Group on Socioeconomic Inequalities in Health have documented large variability in inter-class comparisons in ischemic heart disease (IHD) mortality in OECD countries and the United States (Kunst et al. 1998, 1999). When mortality rates from all causes are compared between manual workers and other workers during the 4th and 5th decades of life, the unfavorable differential for manual workers varies by as much as 150% between countries, and in Switzerland and the Mediterranean countries it approaches parity. When the reference groups consist of professional and administrative workers, the differences

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are even greater. However, when the comparison is restricted to ischemic heart disease mortality, the adverse ratios for manual workers are uniformly elevated and much of the between country difference is leveled.

This suggests that within approximate levels of income and development, occupational status has a particular resilience in predicting death from cardiovascular disease. Because the concentration of risk also follows the distribution of national income and its segregations of wealth, education, and income, no model can fully disentangle risk attribution. However, these observations add weight to the conclusions of Marmot et al. (2001) that the steepest social gradients in health are observed at two stages of the life course -- early childhood and midlife, and employment status and quality of work exert strongest effects on health during this midlife period.

CARDIOVASCULAR DISEASE IN EXPOSURE-BASED OCCUPATIONAL HEALTH STUDIES

It is something of a tradition in occupational medicine that CVD has generally not been included in the exposure-based diseases. Through the first 6 editions of Hunter's, '*Diseases of Occupation*', from 1955-1978 (Hunter's 1955-1978), there are no annotated reference to CVD as an occupationally related disorder. A number of workplace agents have been studied as possible cardio-toxins, and a summary of major studies is presented in Table 2. Among the most potent toxins, there was a small increase in IHD mortality (ICD-9 410-414) for tetrachlorodibenzo-p-dioxin with risk concentrated in the most exposed cohort (Steenland et al. 1999). Current attributable risk, however, appears to be negligible. Similarly, the studies on 7000 inorganic mercury millers and miners by Boffetta et al. (2001), while showing an elevation in non-ischemic heart disease, also

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show quite low SMRs among the pooled national workforces (SMR 0.77) for IHD. Carbon disulfide exposure in the viscous rayon industry posed a clear historic hazard although there is no longer a measurable effect that that appears detectable with various biological markers (Swaen et al. 1994; Drexler et al. 1995). While the risk may remain in industrial environments with less exacting exposure control, even there controls are described as effective (Tan et al. 2004). There is little reason to implicate workplace chemical agents as principal or co-factors in CVD.

SOME OBSERVATIONS ON EMPLOYMENT AND CARDIO SELECTIVITY

It is widely assumed that a pattern of low attributable risk from exposure-specific workplace hazards is amplified in cohort mortality studies where CVD mortality is invariably less elevated than targeted diseases, particularly occupational cancers. In fact, presumably lower mortality rates from cardiac disease and stroke have served as an indicator of the overall health and selectivity of the workforce. The cardio-selective effects of employment should not be overstated, however. In Table 3, nine cohort mortality studies are presented, several of them conducted by fellows of the Collegium Ramazzini. Two derived from dioxin and chloro-phenol exposed populations but can be seen as more general health and disease characterizations of the chemical industry (Kogevinas et al. 1997; Steenland et al. 1986). Table 3 also includes three prominent studies of asbestos-related mortality (Dement et al. 1983; Seidman et al. 1986; Hodgson et al. 1986) and the Canadian workers study on low-level ionizing radiation exposure (Ashmore et al. 1998). The last of these is sufficiently large and equivalent in its gender representation, that it can be viewed as a characterization of two separate cohorts. Turning to the service sector and potentially high stress jobs, the table includes studies of

police workers (Violanti et al. 1998) and firefighters (Baris et al. 2001). In these last two studies, there is no exposure-specific analysis of the work environment, but because of baseline physical fitness selectivity, these cohorts may also be analogous to prison workers, a group that is further discussed below. Perhaps the most striking finding is the general congruence between cardiovascular mortality and all-cause mortality (Figure 4). Because of different ICD applications and inclusiveness, some studies report ischemic heart disease only (ICD-9 410-414) while others include other cardiac diseases (ICD-9 410.0-429.0), hypertension (405.0-409.0), atherosclerotic conditions (ICD-0 440.0-441.0) and stroke (ICD-9 430.0-438.0). The patterns remain much the same, despite the differences in disease classification. Only in the amosite asbestos workers, where the SMR for all cause mortality is 150, is there a notable difference between all cause and cardiovascular mortality, and in this one case the SMR for cardiac disease remains the highest (SMR 120) for any cohort.

Leaving aside issues of 'psycho-social behavioral risk', other assessments from industrial countries ascribe a much higher proportion of work-related risk to physical and structural environmental factors, including shiftwork, noise, and vibration exposure, with an additional strong contribution from sedentary work. Olsen and Christiansen (Olsen et al. 1991) concluded that 16% of male and 22% of female CVD was due to these preventable workplace factors. In Finland, Nuriminen and Karaljainen (Nurminen et al. 2001), addressed the extrinsic risks of the workplace with similar conclusions, attributing 12% of CVD risk to shiftwork and noise. Several of these factors are included in Table 3, which includes an estimate of overall attribution to CVD mortality. This is presented more graphically in Figure 5. However, factors such as noise and shiftwork (McNamee et

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al. 1996; Tuchsen et al. 2006; Knutsson et al. 2004) overlap with organizational and control factors, even if they are more formally hazards of the physical environment. The concerns with small particles and second-hand smoke exposure carry the same concerns in the workplace that they do in the ambient environment (Torén et al. 2007). The contribution from these factors to risk of CVD death in working populations, while not insubstantial in selected cohorts, remains relatively modest.

LIFE COURSE, WORKING LIFE AND CARDIOVASCULAR RISK

Michael Marmot and his colleagues (Marmot et al. 2001) have accumulated perhaps the most concentrated historical record of the effect of social inequalities, particularly in their workplace components, on health and chronic disease, including cardiovascular disease. In their studies of British civil servants, Marmot et al. (1997) used a job content and an effort reward model (Siegrist et al. 1996) to assess coronary heart disease initial event risk. Other independent variables included age, height, other personal factors (smoking, BMI, exercise, cholesterol and hypertension), and social support. For both men and women, social support contributed very little to the risk gradient for initial cardiac event. Work and age were the predominant contributors and dominated the individual risk profile. The implication is that as much as 50% of the differential in risk of ischemic heart disease may be explained by differences in work organization and demand. This parallels the findings of Kunst et al. (1998) on the differential in cardiovascular mortality between manual and non-manual jobs. The study by Kivimaki et al. (2002) of 4570 industrial workers was even more dramatic in its findings: by combining the psychological and physical components of job strain, a 2-fold risk of cardiovascular mortality was identified within the same country and industry. Extreme work-related

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events may carry a greater toll. Vahtera et al. (2004) studied the effect of downsizing and noted a 1.5 to 2 fold increase in cardiovascular mortality in the workforce, depending on the extent of job loss. This again highlights the importance of conditions of work in predicting cardiovascular outcomes.

The current "psychosocial environment" approach to CVD has focused on the contribution of job stress risk factors to variations in CVD incidence. More recent work by Chandola et al. (2005) on the metabolic syndrome, a complex of pre-morbid findings linked to cardiovascular disease, has reinforced these associations with workplace risk at an earlier point in the chronic disease cascade. Over 14 years of observation, job stress was associated with a greater risk of developing metabolic syndrome in an exposure-response pattern that remained robust following adjustment for occupational status (a measure of economic level) and for personal health behaviors. This effect was independent of baseline obesity. On the basis of these observations, it is often assumed that a work environment that offers options of experiencing a level of control over work produces favorable effects on health and well-being whereas the opposite is expected in individuals confined to a more restrictive job design.

There are clear associations between stressful working conditions and the occurrence of acute and chronic cardiovascular events (Schnall et al. 2000; Hall et al. 1993; Karasek et al. 1988; Kristensen 1996; Theorell et al. 1996; Westerholm 1998). Perhaps the most consistent body of workplace-based research links workplace stress to hypertension (Din-Dzietham 2004; Adams et al. 1998) and to angina (ischemic coronary disease) (Chandola et al. 2005). Continuous cardiovascular monitoring has shown the existence of "masked hypertension" at work with a return to normal blood pressure in a clinical setting (Belkic

et al. 2001). Acute events such as heart arrhythmia have also been traced with continuous monitoring and related to occupational stress (Jorna et al. 1993). Other identified risk factors are also important sources of work stress although with less direct mechanisms for cardiovascular disease. These include organizational climate (Clarke et al. 2002) overtime or shiftwork, interference between work and family responsibilities (Gold et al. 1992; Lipscomb et al. 2001; Niedhammer et al. 1996; Rosa et al. 1995), emotional labor (Abraham 1999; Brotheridge et al. 2003; Totterdell et al. 2003), racial or gender discrimination (Jackson et al. 1996; Kessler et al. 1999; Krieger et al. 1996-1997; Landrine et al. 1995; Schultz et al. 2000), and violence at work (Lipscomb et al. 1992). There is additional evidence that poor physical and mental working conditions affect the rate of aging and functional capacity both during and after employment, decreasing elder mental and general health (Cifuentes 2002).

The large variety of risk factors also means a multiplicity of intervention targets. The risks of inundation and dilution are deterrents to intervention projects where job control is a principal outcome.

MEASURING THE RELATIONSHIP BETWEEN THE WORK ENVIRONMENT AND CVD

One limitation of the 'psychosocial environment' approach falls under the domain of measurement. Occupational medicine traditionally places a high priority on reproducible and accurate measurement of exposure and, where possible, individual dose. Measurement of blood pressure, blood sugar and lipids either at the workplace or in the clinic may seem to offer a sturdier platform than survey-derived psycho-social determinants. This introduces the issue of instruments for workplace evaluation of the

psycho-social work environment. Two models have come into general use for assessment of this relationship between individual, psychological and work sociological factors – the job-strain model and the effort-reward imbalance model. Both models belong to a progressive social tradition of empowerment and change. The Job Content Questionnaire (JCQ) of Karasek (1979) is the most commonly used measurement instrument of the demand-control constructs, with a valuing of the effect of skill development, autonomy, and support at work. More abstractly, resolution of the dilemma of physical and organizational demand without reciprocal power in the workplace can be imagined as broadly as a democratic sensibility. As is widely known, the model has multi-factorial contingencies so that the risk of high demand, for example, is counterposed by the ability to actively control work content. The pattern of high demand and low control (job strain) has carried a particular adverse cardiovascular risk (Schnall et al. 2000; Stansfeld et al. 2002).

With the effort–reward imbalance model, Siegrist (1996) assumes a "distributive justice" institutional perspective, where the labor contract is a reciprocal exchange of work and demand (effort) in return for income, job security, social mobility, and esteem. The "effort-reward imbalance" is designed to measure the symmetry or asymmetry of the relationship. In addition to non-equivalent or asymmetric exchange, particularly when rationalized by local labor surplus, there is a more personal domain, the assessed difficulty in coping with work demands, called 'overcommitment'. While somewhat different in their approaches to strain and reward, the two models are substantially complementary (Stansfeld et al. 2002; Bosma et al. 1998).

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Despite their utility and the progressive nature of their traditions and current focus, elimination of work-related health inequalities, skepticism remains due to problems of application, a more frequent use within wealthy countries, and the localized and particular characteristics of individual workplaces. There is, as well, a concern that the overlap with a lifestyles or workplace health promotion approach replaces a direct responsibility of the employer and the government (quantifiable extrinsic exposure) with a more diffusely shared liability, and a liability with very different levels of access to power and instruments of change.

CPH-NEW AND CHRONIC CVD INTERVENTIONS

The Center for the Promotion of Health in the New England Workplace (CPH-NEW) is a collaborative research-to-practice initiative led by investigators from the University of Massachusetts Lowell (UML) and the University of Connecticut (UCONN). The Center's research goal is to evaluate the feasibility, effectiveness, and economic benefits of integrating occupational health and safety with health promotion interventions to improve employee health. There is a strong emphasis on workplace occupational ergonomic interventions and on worker involvement. Outcomes of particular interest include musculoskeletal health, mental health, and cardiovascular health. The general approach is to pay greater attention to the physical environment and workplace design and organization ("macro-ergonomics") and to quantify physiological function that predicts disease and is susceptible to intervention in the short-term, e.g., sarcopenia, exercise reserve, and power generation.

CPH-NEW has three core projects: one which involves reduction of manual patient handling with two types of wellness programs in a chain of more than 200 nursing

homes; a second which compares professional top-down health and promotion and worker safety programs with participatory programs, with programs based both at a private workplace and a prison; and an outreach program aimed at "mainstreaming" the knowledge about workplace risks of heart disease and stroke into the general preventive and clinical health communities. These specific program initiatives are discussed below in light of previously mentioned complexities of addressing cardiovascular risk in the workplace.

CORRECTIONAL OFFICERS AND COHORT-TARGETED INTERVENTIONS

One major CPH-NEW study, HITEC (Table 1), involves interventions in the working conditions and individual disease risk profiles of correctional officers (COs). While there is increasing attention to the health of inmate populations, there is a very modest body of information on the health of COs. Several studies have described exceptionally high stress levels among correctional officer (Keinan et al. 2007; Schaufeli et al. 2000; Goldberg et al. 2006), limited job autonomy (Dollard et al. 1998), and biomarkers consistent with elevated catecholamines (Harenstam et al. 1988). A study of American correctional officers by McCraty et al. (2003) produced a very complex profile. COs reported considerably less smoking and use of alcohol than reference population, and were much less likely to report serious co-morbidities. Compared to reference groups, they were also much less likely to exercise, were considerably more overweight, and were more likely to be hypertensive and hyperlipidemic. They were also estimated to have a considerably greater biological age than their peers.

The high risk profile of CO's is replicated in other areas, specifically a suicide rate which appears to be double that of reference populations (Stack et al. 1997). Studies of COs

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show a high profile of adverse psychosocial factors. Cullen et al. (1985) looked at the domains of work stress, job dissatisfaction and life stress, finding that the physical danger of the job transcended all categories, an important role for supervisory support, and an inverse effect of education on job dissatisfaction. In their review of 43 studies from nine countries, Schaufelli and Peeters (2000) made the somewhat contradictory observations that while stress levels, lack of variety and inability to use training and education were highly negative factors, greater decision latitude was actually associated with greater stress.

The apparent risk profile is of some particular interest, because of the high fitness requirements at the point of hire. In the State of Connecticut, for example, both state police officers and correctional officers must meet the 40th percentile of the Cooper Institute standard, a level which should qualify them as fit and in a reduced cardiac disease risk category (Farrell et al. 1998).

The lack of job satisfaction is reflected in the CPH-NEW CO population by retirement decisions. The average age of retirement is young (50.13 years), and there is an overwhelming selection to leave employment at 20 years of service when full vesting has occurred (Figures 6 and 7).

The level of CVD mortality in COs are controversial. While there is a strong institutional belief in elevated CVD risk, there are scant life data. The Canadian Corrections Service reported that male COs had a life expectancy of 77.48 years, 1.10 years less than other public employees (Beavon et al. 1993). While the conclusion was that concerns over CVD risk may be overstated, there are mitigating issues. Most COs in Canada have retired or left the armed services, join in their third decade, and are considerably more fit

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than other government workers at baseline. As noted in the CPH-NEW target population, the very early age at retirement usually results in a 2nd or 3rd career and little institutional tracking of long-term health outcomes. A review of deaths occurring during the 3th and 4th decade of life in the state workforce as compared to the department of corrections workforce showed that COs are 1.5 to 3 times more likely to die during employment as other state workers (Figure 8). While the death rates are crude and are not cause specific, they at least suggest a pattern that requires exploration.

NURSING AIDES IN LONG-TERM CARE FACILITIES

This intervention study is taking place within a large chain of nursing home facilities which has implemented a "no-lift" program involving purchase of resident handling devices in combination with training and related protocols. An optional "Wellness" program has been adopted in 30 of these facilities to date and will follow in others in the near future. In addition, the investigators will implement an independently designed, participatory program in selected other facilities, incorporating best practices in worksite health promotion. The key study comparisons examine changes over time in cardiovascular risk factors, e.g., obesity, smoking, and hypertension; mental health; and health self-efficacy among three groups of centers: NLP alone, NLP plus wellness program, and NLP plus participatory health promotion teams.

To date, about 800 questionnaires have been collected in ten nursing homes from clinical nursing staff, primarily certified nursing aides. These are low-wage workers of which over 90% are female and 65% are Afro-American. One-half worked more than 75 hours per two weeks at the nursing home, and 1 in 5 reported working a second paid job. Only 23% were current smokers; about 25% reported medical history of hypertension. More

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than half were overweight or obese, and losing weight was the single most desired change in personal health that participants reported.

With regard to the effect of working conditions on health, respondents exercising at least once per week were more likely to report control over their work schedules, and (less strongly) to have a good work/family balance. Smokers were more likely than non-smokers to report higher levels of job strain and to have experienced recent physical assault at work. Excellent versus poor self-rated health was correlated with good supervisor support, good work-family balance, low job strain, and infrequent exposure to work place assaults. About two-thirds reported that not having enough staff was an important factor in how their job or workplace affects their health. These findings all suggest that employee-directed interventions oriented to the organization of work schedules and social relations could facilitate pre-conditions for improved cardiovascular health.

DISSEMINATION AND TRANSLATION PROJECT

Organized public health efforts designed to raise awareness of CVD and spur concrete action to prevent it should include as an essential component an emphasis on workplace stress. Health educators, other public health professionals, and clinical practitioners must be provided the information they need to address workplace stress and CVD. This project involves the development, delivery and evaluation of curricula on workplace stress and CVD which are targeted to several different professional groups. This targeted education and outreach effort is coordinated with, and in part implemented through, an innovative state-wide consortium for primary, secondary, and tertiary prevention of heart disease and stroke that is organized by the Massachusetts Department of Public Health (MDPH). The

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investigators are also collaborating with the chronic disease personnel of MDPH to identify areas of public health activity that would benefit from the inclusion of an occupational health and safety perspective.

We have chosen two pilot audiences for our initial outreach activities. Cardiologists were selected because of the strong and well-documented connection between occupational stress and cardiovascular disease, and our expectation that cardiologists' beliefs and practices exert powerful influence on other clinicians in this area of medicine. Employee Assistance Professionals (EAPs) were selected because they are already engaged in workplace issues as an inherent part of their professional role.

The assessment and curriculum development with EAPs seems to coincide with a beginning of a shift in this profession. Several recent articles in EAP-oriented publications raise the issue of the work environment as an important factor in contributing to employee stress. This is presented as a new, cutting edge concept. The one pilot survey with an EAP and informal conversations suggest that the concept of the work environment as a source of stress potentially significant for health is unfamiliar, but that members of this profession are interested in learning more.

A challenge continues to be the application of this type of knowledge to the work of people in the health and helping professions. Once clinicians or practitioners have improved their understanding of the association between work stress and CVD, it will be imperative to explore with them feasible mechanisms for applying this knowledge to their work with patients and clients.

DISCUSSION

While many of the assumptions about the relationship between work and CVD in terms of international equity and exposure vector may be answerable, significant problems remain.

The first is whether it is methodologically possible to sufficiently segregate the processes of accumulated exposure, critical exposure or period effects, and the combination of social mobility and job process change. For example, in the Turin longitudinal study, Cardano et al. (2004) evaluated the impact of job mobility on standardized mortality in the context of comparative rates between manual workers and professional workers. For men more than women, both gradients were strong predictors of early death. A problem that is particularly pertinent to the life cycle or life history approach is the temporal breath of potential risk factors, coupled to the contributions of various other life factors. Explanatory factors can flood any model.

A second problem is more generic for chronic diseases where there are multiple risk factors and a substantial interval between age when interventions are most effective and age of disease expression. The principal gains in quality of life or life-years gained occur late in working life and are offset by a separation from the most effective period for intervention. For example, the most effective workplace related interventions for controlling hypertension and cardiovascular disease should be targeted to the third decade, where the major health effects and accumulation of lost working years occurs two decades later, and this relationship appears to be even more specific in developing industrial economies (Murray et al. 2003). An intervention directed resource shift to the workplace becomes highly problematic, even when employers have an economic stake in

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chronic disease burden. At the least, Cost Effectiveness Analysis (CEA) and Cost Utility

Analysis (CUA) can be used to identify cost-neutral CVD interventions and those

requiring a resource shift to the workplace. This is only half of the problem, since

employers have not been the traditional managers of CVD.

A third problem is the sufficiency of the measurement tools and their applicability to

focused intervention. The workplace may be too limited in size and lifespan involvement

to subsidize a generalized CVD protective program, particularly if it requires changes in

work organization and organizational culture, when most members of the workforce may

initiate limited health care costs or productivity losses. The reason is complexity due to

the multiplicity of intervention targets that include: organizational climate, overtime or

shiftwork, interference between work and family responsibilities, emotional labor, racial

or gender discrimination, and violence at work. On the other hand, concentration on the

highly morbid sub-populations of the extremely obese or the incumbent CVD population

may be too narrow to easily justify costly interventions. Figure 9 depicts a range of

pathways and interactions germane to the workplace that influence cardiovascular health

and cardiovascular disease. The programmatic costs may exceed the value of labor for all

but the largest and wealthiest enterprises.

Finally, the international context, the emphases on medical care of hypertension, dietary

shifts and nutrition, and infectious disease, may still outweigh interventions that focus on

workplace stress models. Intervention strategies need to be selective and specific.

The evolving intervention program for COs within CPH-NEW will incorporate baseline

Health Risk Assessment (HRA) and individual physiologic data in both workplace based

and health promotion programs. The particular challenge is the structural origin of risk

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factors. On the other hand, the principal issues have a more generic, even international content and lend themselves to generalizability.

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Table 1. Core Projects of CPH-NEW

Project A *Promoting Physical and Mental Health of Caregivers through Transdisciplinary Intervention*	Interventions: 1. ergonomics intervention only 2. ergonomics intervention plus health promotion 3. a participatory health promotion regimen integrated with the ergonomics intervention involving more than 200 nursing homes
Project B *Health Improvement Through Training and Employee Control (HITEC)*	Comparisons at paired sites of traditional workplace health promotion intervention program with an experimental program featuring program development through employee participation.
Project C *The Education, Translation, Communication and Dissemination Project*	Outreach program to traditional and non-traditional practitioners to extend 1) the definition and efficacy of health promotion-occupational health and safety integration, and 2) the relationship between work-related stress and the development of heart disease and stroke.

Table 2. Agent Specific Occupational Exposures and CVD Morality

Agent	Studies	Result	Attributable CVD Mortality Workforce Risk
2.3.7,8-tetrachlorodibenzo-p-dioxin	Steenland et al.1999	~10% elevated IHD mortality	<1% No significant current risk
Inorganic Mercury	Boffetta et al. 2001 Cragle et al. 1984	No IHD ↑ mortality No IHD ↑ mortality	<1% No evidence of risk
Carbon Disulfide	Tolonen et al. 1975 Tolonen et al. 1979 Macmahon and Monson, 1988 Drexler et al. 1995 Swaen et al. 1994 Tan et al. 2004	2x ↑CVD mortality f/u ↑ risk of fatal MI (4-8x) ~40% ↑CVD mortality No CV risk at current levels 15% ↑CVD mortality(1947-80) No risk in current workforce	<1% Historic risk to older workers; no measurable risk in current workplace
Nitrate Esters	Stayner et al. 1992 Levine et al. 1986	No ↑CVD mortality 31% ↑CVD mortality 1940-50s	<1% No current risk
Noise and Vibration	Van Kempen et al. 2002 Bohr et al. 2006 Nurminen and Karjailanen 2001	20% ↑CVD mortality per 5 db 1.4-2.0 OR↑MI incidence 20% ↑IHD risk (includingshiftwork)	5% risk
Second hand smoke Small particles	Toren et al. 2007	10% ↑IHD mortality	2.5% risk
Shiftwork	McNamee et al. 1996 Tuchsen et al .2006 Knutson et al. 2004	~10%↓ mortality risk 33%↑CVD risk 5%↑all cause mortality	↑5% mortality risk

Table 3. Cardiovascular Mortality in Selected Cohort Studies

Study	Exposure	Population	Total Deaths	All Cause Mortality - SMR	Cardiovascular Mortality – SMR ICD-9: 390-458
Kogevinas et al. 1997	Phenoxy herbidices/ chlorophenols	9 countries 36 cohorts 21,863 subjects	4,026 ♂ 133 ♀	0.97 [0.94-1.00] ♂ 0.98 [0.82-1.17] ♀	0.91 [0.87-0.95] ♂ 1.00 [0.73-1.32] ♀
Sorahan et al. 2001	Carbon Black	1,147♂	372♂	1.13 [1.02-1.25] ♂	1.00 [0.85-1.17] ♂
Baris et al. 2001	Firefighting	7,789♂	2,220♂	0.96 [0.92-0.99] ♂	1.01 [0.96-1.07] ♂
Dement et al. 1983	Asbestos textiles	1,261♂	308♂	1.50 ♂	1.25 ♂*
Hodgson and Jones 1986	Asbestos	31,150♂	1,128♂	0.87 ♂	0.83 ♂
Steenland et al. 1999	Dioxin/chem workers	5,132 ♂	1,444♂	1.03 (0.97–1.08) ♂	1.09 (1.00–1.20) ♂+
Seidman et al. 1986	Asbestos	820♂	593♂	1.67 ♂	1.20♂#
Ashmore et al. 1998	Ionizing radiation	206,620 105,456♂ 101,164♀	4,210♂ 2,016♀	0.59 [0.57-0.60] ♂ 0.61 [0.59-0.65] ♀	0.61 [0.59-0.64] ♂ 0.50 [0.45-0.55] ♀
Violanti et al. 1998	Police work	2,693♂	1,035♂	1.10 [1.04–1.17]♂	1.00 [0.92–1.10]♂

*ICDA- 400-468;
+ICD-9 – 410-414 (IHD);
ICD unspecified

FIGURE LEGENDS

Figure 1. Paradigm for CPH-NEW

Figure 2. International comparisons of Cardiovascular mortality. Source: http://www.who.int/cardiovascular_diseases resources/atlas/en/ [date accessed]

Figure 3. Healthy Worker Effect and Cardiovascular Mortality. Source: Annex Table 1, World Health Report 2004. www.who.int/whr [date accessed]

Figure 4. Comparison of SMR for CVD and All Cause Mortality in Selected Cohort Studies

Figure 5. CVD mortality and known causes

Figure 6. Retirement Age of Department of Correctional Officers

Figure 7. Average Tenure at Retirement – Correctional Officers

Figure 8. Mortality of Public Sector Workers

Figure 9. The Patterns of Interactive Risks

Figure 1.

Improved Health Outcomes

Interventions

Disease Management

Health Prevention

Workplace Prevention

Reformed Insurance Reimbursement Practices

Interventions

Improved Cost Effectiveness

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Figure 2.

Cardiovascular Mortality and Contribution to Overall Mortality

Figure 3.

Premature Mortality and Disability Attributable to CVD

Legend:
- ♂ likelihood of death ages 15-60
- ♀ likelihood of death ages 15-60
- ♂♀ Disability Adjusted lifeyears due to CVD

Y-axis: Likelihood of dying between age 15-60 and DALYs

X-axis (Country): South Africa, Egypt, Indonesia, Brazil, Turkey, China, United States, Japan, Italy, Sweden

Figure 4.

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Figure 5.

Proportion of Cardio-Vascular
Mortality Associated with Occupation

Agent-specific mortality

Physical hazards and
shiftwork

Psychosocial Behavioral
Factors Periodic Effects

Age-cohort
Effects

Variance

44

Figure 6.

Age at Retirement for Corrections Officers 2000-2006

Figure 7.

Years of Service at Retirement

Number of people retiring 2000-2006

Number of years of service

Figure 8.

Crude Mortality Rate State Workers 2003-2007
Ages 30-49

47

Figure 9.

Manuscript Number:

Title: Assessment of a Worksite Health Promotion Readiness Checklist

Article Type: Original Article

Keywords: worksite health promotion, readiness, checklist, assessment

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Manuscript Region of Origin: UNITED STATES

Abstract: Objective: To assess the utility of Worksite Readiness CheckList (WRCL) a survey instrument designed to assess the readiness of worksites for health promotion and health protection programs. Methods: WRCL was pilot tested in sites grouped as worksites with no heath promotion programs (WHPn) and worksites with health promotion programs (WHPy). The two parts of WRCL-observational and administrative checklist scores for WHPn and WHPy were compared within and between the sites to establish the utility and sensitivity of the instrument. Interrater reliability of the observational checklist was tested. Non-parametric analyses of the scores explain the results. Results: Observational checklist demonstrates high interrater reliability of $p<0.05$ for most items in the questionnaire. Administrative part showed low scores on some sites due to discrepant responses between administrators. Overall, WHPy scored higher than the WHPn sites. Conclusions: WRCL could be a valid and reliable instrument to measure readiness of a worksite towards health promotion and health protection programs.

Assessment of a Worksite Health Promotion Readiness

Checklist

With the significant increases in health care costs, worksite health promotion (WHP) programs have been identified as a potentially effective approach to reduce the risk factors for chronic diseases. Chronic diseases are major contributors to death and disability and to the associated increases in health care costs. Wellness programs at work have shown some reductions in employee absenteeism and presenteeism and thus cost savings for the participating worksites.[6, 7, 8, 9, 10] However, worksite health promotion programs often disproportionately reach higher-income employees and those who are healthier to begin with.

In addressing employee health at the workplace, attention is typically centered separately on the areas of health promotion, occupational safety/health, and employee assistance programs. In order to improve employees' health, an integrative or systems approach is essential to address not only workplace safety, but also employee health risks and behaviors related to job performance, worksite ergonomics, and safety. It has been argued that the effectiveness of WHP programs could be improved when combined with worksite health protection programs addressing occupational health, ergonomics, and safety.[3, 4, 5] According to Baker et al. (1996), both worksite health promotion and occupational health and safety practitioners should collaborate on comprehensive programs because the influences of individual behavior, psychosocial, organizational, and contextual factors are inter-related.

Furthermore, integrating health protection with health promotion programs may create more cost effective interventions due to use of shared resources.[3, 4, 5] The WorkLife Initiative developed by the National Institute for Occupational Safety and Health (NIOSH) envisions workplaces free of recognized exposure hazards that also develop health-promoting and sustaining policies, programs, and practices. NIOSH also envisions employees with ready access to effective programs and services that protect their health, safety, and wellbeing.[13, 14]

According to Healthy People 2010, the five key elements for successful WHP programs are: 1) health education, 2) supportive social and physical work environment, 3) integration with the organization's structures, 4) linkage with other related programs such as employee assistance, and 5) worksite screening and education. [11, 12] Additionally, health and wellness programs must be tailored to worksites organization policies and culture, to size, and to geographical area. Experts suggest that a 'one size fits all' approach to improve employees' health through health promotion programs may less successful than more contoured programs.

To have an effective worksite health promotion program, it is also essential to have both a favorable physical environment and a managerial and organizational culture supportive of a health-promoting work environment.[11] To bring about organizational and cultural change requires a combination of education, behavior change intervention, and customized facilities, services and strategies. It is important that employers demonstrate a

commitment to health and wellness that is fully integrated with their mission, values and long-term vision, paving the way for sustainable lifestyle changes.[15]

A framework for assessing overall progress towards implementing health promotion and health protection programs seems an appropriate prerequisite for successful implementation. To measure the impact and outcomes of wellness programs, evaluation systems are vital for WHP program success. Assessment tools such as the Occupational Safety and Health Administration (OSHA) checklist have been developed to address workplace safety and environmental hazards, but they have no recognized utility for assessing health behaviors. Instruments developed to evaluate WHP programs are mostly specific a limited number of program areas. In developing evaluation tools a system approach is necessary to address organizational culture, physical environment, as well as health and safety risks. The first step for developing a successful integrated health promotion and health protection program is to assess level of readiness, including management support, policies, and the physical work environment.

We have developed an assessment tool entitled the Worksite Readiness Checklist (WRCL) for measuring the needs and level of readiness for worksite health promotion and health protection programs. The purpose of this research was to assess the response coherence, reliability and convergent validity of this instrument. The study hypothesis was that worksites having health promotion and health protection activities would score higher in the corresponding parts of WRCL, compared to worksites without those activities.

METHODS

Background for WRCL Development:

The WRCL was developed by academic investigators and experts in the field of health promotion, occupational safety, ergonomics, and work organization. The WRCL relied on relevant literature and existing tools, and was guided by an ecological model.[26] . A brief review of contributory instruments and the basis for their inclusion follows.

The Checklist of Health Promotion Environments at Worksites (CHEW), a 112- item instrument, was developed by Oldenburg et al. (2002) for direct observation to assess characteristics of worksite environments known to influence health-related behaviors including physical activity, healthy eating, alcohol consumption and smoking. The three environmental dimensions assessed by CHEW were physical characteristics of the worksite, features of the information environment, and characteristics of the immediate neighborhood around the workplace. [18] It has acceptable face validity and generates objective, interpretable indicators that are useful for informing the development, implementation and evaluation of health behavior programs in the workplace. The WRCL incorporated some CHEW items on the physical environmental factors that are important for WHP programs.[18]

Similarly, the HeartCheck instrument is an organizational assessment tool, constructed to measure the structures of an organization that support employee heart health: smoking, nutrition, fitness, stress, screening and administrative support.[19] A related instrument,

"WorkCheck," was framed similarly, having the same content areas as HeartCheck, but emphasizing components addressed by a managed care provider. [20] It included items such as mental health, violence prevention, safety, maternal health, substance abuse and disability management. [19, 20] Both HeartCheck[19] and WorkCheck instruments were consulted for inclusion of WRCL elements on organizational factors influencing worksite health promotion.

The Health Employment Research Organization (HERO) developed the "Health Management Best Practice Scorecard" to measure organizational support. Scorecard items are based on best practices in Employee Health Management (EHM) and are divided into six sections: strategic planning, leadership engagement, program level management, programs, engagement methods, and measurement & evaluation. [21, 22] HERO was consulted as a content check for the WRCL. However, although HERO assesses management attitude towards employee health, it does not describe in detail the availability of resources like the physical environment, or health and safety.

The WRCL items on workplace health and safety were developed in a parallel fashion by consulting existing tools towards safety climate at worksites. For example, one useful source was Engquist et al. (1998), who tested the validity and internal consistency of a new measure of organizational health and safety climate that was used in a large randomized trial of a worksite cancer prevention program (Working Well Trial). [23]

The WRCL developers also reviewed studies recommending development of practical tools, including other checklists.[24, 25] Plotnikoff et al. (2005) developed and tested a comprehensive multilevel workplace physical activity assessment tool to evaluate workplace physical activity.[24] The three-phase project was based on an ecological framework [26] with an occupational health and safety program to operationalize the ecological model.

Similar tools to WRCL have been developed recently. The 'Community–Wide Cardiovascular Risk Reduction Assessment instrument' was developed by Goetzel et al. (2009) to encourage and guide businesses with less than 500 employees to implement new ways or improve existing worksite health promotion programs. This tool provides feedback on worksite characteristics, worksite policies, practices and environment, and organizational support.[27]

A recently developed health promotion evaluation tool by Dunet et al. (2008) is the Swift Worksite Assessment and Translation (SWAT). This evaluation method is used to identify promising practices in existing WHP programs and guide recommendations.[28] The set of criteria used in the interpretative assessments for SWAT include categories such as health promotion program goals, present WHP practices, policy supports and environment supports.[28] These criteria represent integral parts of a successful WHP program and are also included in our Worksite Readiness Checklist instrument.

WRCL Instrument:

The WRCL was developed in two parts, reflecting the reality that some environmental characteristics can be assessed by observation but others, especially administrative and organizational features, are difficult to observe directly, especially by someone who does

not work within the organization. Thus, the first part is an interview with the worksite administrator (WRCL-ADS) consisting of 45 items, while the second part is an observational survey (WRCL-OBS) consisting of 63 items.

WRCL-ADS pursues detailed knowledge about present workplace health promotion activities, policies, and support. Each scored item has response options of "Yes, No and Don't Know". For the purpose of data analysis, all scored items in the data sheet are given a nominal score of "Yes = 2", "No = 0", and "Don't Know" marked as "D/K" without any numerical value.

WRCL-OBS was designed to be completed by a trained observer during a tour of the worksite. It consists of 65 questions that are used to assess the physical characteristics of a worksite which influence health promotion activities. Each item has response options of "Yes, No, and Not Applicable". For the purpose of data analysis, the item responses are given nominal values of "Yes=2" and "No=0", and "Not applicable" marked as "N/A" without a numerical value.

Study Sites:

Six New England nursing home worksites, all belonging to the same national company were selected from a larger project for WRCL pilot testing. They were classified on the basis of prior knowledge as having on-site health promotion activities (WHPy) or not (WHPn), with three in each group. All six nursing homes had health protection programs (safe resident handling, needlestick prevention, etc.) administered by the same corporate office. Institutional similarity and geographical proximity were the main selection criteria.

Procedure:

Approval to collect WRCL data was obtained from the regional health and safety representative of the company. The checklist and the pilot testing procedure were approved by the University of Connecticut Institutional Review Board. A memorandum was sent to all six nursing homes by the company administrator regarding the WRCL survey.

A packet was mailed to each center administrator with a cover letter explaining the project purpose and three copies of the WRCL-ADS survey. In each nursing home, the survey was completed by the Administrator, the Director of Nursing, and either a Wellness Coordinator or another person in a similar position, such as the Administrator of Social Services.

Two researchers were trained to complete the WRCL-OBS. During a scheduled visit and tour of the facility, each observer completed the survey independently for each nursing home. The research team also collected the surveys and ensured their completeness.

Data Analysis:

WRCL-ADS was divided into three sections: Health Promotion (HP), Organizational Culture and Management (OR), and Health and Safety (HS) (Table 1).

INSERT TABLE 1

The item responses in each section were scored nominally. Data from the three administrative respondents from each site were reduced to a single item score per site by combining the responses as shown in Table 2. The questions with discordant answers among the respondents received an intermediate value. Items with three 'Don't Know' responses were also treated as disagreeing with each other. The questions identified as having discordant responses among the three administrators in each site were identified for item analysis.

A maximum possible score was calculated for each section by adding up all the questions from that section. The composite scores for all questions in the WRCL-ADS sections of HP, OR, and HS generated a new smaller data set consisting of the six independent sites. The scores were then compared between the WHPn and WHPy sites to validate the pilot test results.

INSERT TABLE 2

WRCL-OBS was divided into three sections: Physical Environment (PE), Work Setting (WS), and Safety Environment (SE) (Table 3). Each item was analyzed for agreement between the two observers for each section of the WRCL-OBS. The items that had disagreement were identified for further discussion. The mean of the scores obtained from the two observers was expressed as a percentage of the maximum possible value for each site.

INSERT TABLE 3

The data were entered into SPSS 14 to generate descriptive statistics and to analyze inter-rater reliability with the Kappa coefficient. Statistical significance was judged as a p-value of 0.05.

RESULTS

All of the six centers were medium-sized workplaces with more than 100 employees, working in three shifts. In each center, a majority of employees were female and fewer than 25% worked at desk jobs doing administrative and/or clerical work. The remaining 75% of the employees were nurses or nursing aides providing direct care to residents.

Each facility had only one Administrator, one Director of Nursing, and an Assistant Administrator. Some of the facilities also had a Wellness Coordinator. The administrators of social services, recreation director, or other similar positions acted as the Wellness Coordinator in these worksites. The WRCL-ADS was completed by a total of 18 individuals (three administrative staff per site).

WRCL-ADS: There was a high degree of variability in the scores for each section of the administrative survey, both within and between the (WHPn) and the (WHPy) sites (Figure 1). The highest values were observed for the HS section.

INSERT FIGURE 1

In the *HP section*, the WHPn sites had lower scores than the WHPy sites. In contrast, one WHPn site (site 3) had a high score equivalent to those in the 'WHPy' group. One WHPy center (site 5) had an extremely low score of 20.8%.

In the *OR section*, the WHPn sites had lower or similar scores as the WHPy sites. One WHPn site (site 3) had a higher score comparable to the WHPy sites, whereas one WHPy center (site 4) had lower scores comparable to the WHPn sites.

In the *HS section*, there was no difference between the WHPn and WHPy sites. Site 5 had a lower score than those of the other centers. In all the three sections of the WRCL-ADS, there was a significant difference in scores for site 3 and site 5.

The questions with disagreement in responses among administrators in each center are identified in Table 4. Noticeably, none of the sites have any items with responses as "Don't Know" from all three administrators.

INSERT TABLE 4

WRCL-OBS: Within each section, there were few differences within or between the WHPn and WHPy groups (Figure 2).

INSERT FIGURE 2

In the PE section, WHPn sites scored lower than the WHPy sites. In the WS section, the WHPn sites scored less than or similarly to the WHPy sites. One WHPn center (site 2) had a higher score than the WHPy sites. The SE section provided the sub-score with the highest values and there were few differences among centers.

The inter-rater reliability of the WRCL-OBS items showed 100% agreement between the two observers, except for two questions in the SE section and 3 questions in the WS section. Table 5 depicts the disagreement between observers in WRCL-OBS.

INSERT TABLE 5

DISCUSSION

In this sample of six nursing homes, the scores for each section of the administrator interviews were slightly higher in the centers with health promotion programs than in those sites without such programs. Although the administrators from the WHPy sites reported having health promotion programs, in reality the activities offered at each of these workplaces were very limited. There were few overall differences between the two groups in the observational scores.

Oldenburg et al. (2002) advocated scoring as a way of comparing worksites in each domain and giving an indication on the salience of health promotion at worksites. Similarly, the EAT checklist, HeartCheck, and other instruments have been used to compare control and intervention sites. Checklists that can be scored also identify improvement overtime. [18, 19, 25] In these studies, summary scores have been most useful where responses (yes, no) are dichotomous. Summary scores were used to establish the utility of the WRCL by comparing the sites with and without health promotion.

WRCL-ADS: Among the WHPn sites, Site 3 had higher scores for all the three sections, which were on a par with the WHPy sites. This may be explained by the delayed response from this site administrators' completing the WRCL-ADS. Some health

promotion interventions were started in these sites by the ProCare research team during periods when, according to the site administrator reported, the administrative staff being busy with inspections and internal review procedures.

Among the WHPy sites, Site 5 consistently had the lowest scores. This low score can be attributed to disagreement between the three administrators. Site 4 also had a lower score in HP and OR sections which can be attributed to the discrepant responses among the administrators. The Executive Director was more likely to report that health promotion events were taking place, whereas the Director of Nursing and the Assistant Director of Nursing disagreed.

The HP section scores were skewed for both WHPn sites and the WHPy sites. In the OR section, WHPy sites had higher scores than the WHPn. However, Site 3 (WHPn) scored higher or on a par with the WHPy sites, and site 5 scored lower in comparison to the other two WHPy sites. This skewing of scores was due, as discussed earlier, to discrepant responses between the administrators and the delayed survey response.

Overall, for the HS section, both the WHPn and WHPy sites scored similarly. In general the lack of a significant difference in scores between the WHPn and WHPy sites for health and safety was not unexpected, since it is not a part of health promotion programs in these sites. OSHA rules and federal health and safety laws and policies are followed by all sites in a similar way, and these corporate wide mandates may account for the similar scores across the worksites. Results from the ProCare survey indicated that the majority of employees at all sites reported that worksite health and safety issues were considered to be important. This correlates well with the high scores on the HS section. Plotnikoff et al. found similar results in their pilot test of WPAAT (Workplace Physical Activity Assessment Tool). All workplaces scored high on their safety and risk management component. From the WPAAT study, they concluded that the reason for high scores was recognition of the government's safety standards legislation. [24] This evidence indicates the sensitivity of the instrument.

Response coherence of the WRCL-ADS: The analysis of responses showed that one WHPy sites, Site 4, had the highest number of discordant responses among the three administrative staff for both the HP and OR sections. For all the questions in these sections, there were disagreements between the administrator and the other managerial respondents. This suggests either the administrator lack of awareness or failure to communicate well with other staff. Hence the site had relative low scores on HP and OR sections. A high score on the HS section was accompanied by agreement may reflect that health and safety laws require all employees to be trained. This may provide additional evidence for the utility and sensitivity of the administrative part of the WRCL instrument.

WRCL-OBS: The observational part of the WRCL had good inter-rater reliability for most items in the survey, as high as 100% agreement between observers for almost all questions. The questions on safety environment and working conditions showed disagreement on questions that were more situational or perceptional. The reason for the disagreement may be attributed to the different timing of the site observation by the two observers completing the survey.

During the early development of the HeartCheck instrument [19], four sites were used for reliability testing. Due to the small sample size that prevented a more traditional approach

to inter-rater reliability, like kappa statistics, the study used a predetermined cut-off of 80% rater agreement as the minimum measure for consistency. We used the same scoring system for the evaluation of the WRCL-OBS.

The scores on the PE section support the study hypothesis with the WHPn sites scoring relatively lower compared to the WHPy sites. The WS section also supports the study hypothesis, there being similar or relatively higher scores at all WHPy sites, except for one WHPn site (Site 2) which also scored higher. Site 2 higher score can be attributed to the relaxation facilities with amenities that were provided to the staff, along with flexibility of use during working hours.

In the SE section, there was no significant difference between the WHPn and WHPy sites. All sites had a score of 80% or higher. We presume that the reason for these consistently high scores was adherence of government to regulated safety standards that are followed by all worksites.

The above evidence supports use of the WRCL-OBS as a valid assessment tool. Results from this pilot study also shows good reliability for the worksite readiness checklist (WRCL). Both parts of the checklist – administrative and the observational -- had items with good reliability between the responders. The differentiation of sites without health promotion (WHPn) from sites with health promotion (WHPy) indicates that the instrument is sensitive to WHP program elements.

There were no highly variable scores between the two groups of worksites WHPn and WHPy. This is explained by inter-instrument inconsistency: although the WHPy sites claimed to have some kind of wellness activities in place, our observational checklist and the administrator surveys showed low readiness scores. The 2004 National Worksite Health Promotion Survey also showed that worksites with self-reported health promotion programs had low survey scores. [6] Workplaces with lower scores lacked intensive health promotion programs, measured by five key evaluation criteria.

The overall section scores are meaningful when compared both between sites and in the context of the maximum possible scores. They can be used to identify and improve areas in health promotion and health protection programs and for planning. Initial scores for a site can be used as a benchmark for subsequent evaluations to identify improvements over time.

Literature on WHP shows that multilevel approaches to individual, organizational and community factors create a need for multilevel intervention evaluation methods. Assessment tools like CHEW evaluate the physical environment specifically; the WPAAT assesses physical activity in the context of the multiple environments that co-exist in the workplace. Our instrument, the Worksite Readiness Checklist (WRCL), evaluates a variety of health and safety aspects of a workplace.

The disagreement among the administrators and very low scores on the WRCL-ADS sections suggest differences in perspective or communication problems within the managerial staff. Clearly, the selection of the individual(s) who provide responses could have an important influence on the results. Linnan et al. (2008) reported that lack of management support was one of the barriers for successful health promotion program. Others have noted the importance of a consensus between administrative personnel, as a

key component of a successful workplace program, as was observed in this study. [6] As a caveat, the one instance where the administrator was overly optimistic about program, could reflect a lack of awareness of the true level of need and the resource requirements for a successful program.

The administrative staff at worksites has to be aware of health promotion and health protection policies and programs. The importance of workplace mission and goals and policies needs to be stressed among the administrators.

CONCLUSION

The content validity of the instrument was established by thorough evaluation of items in specific areas.

Face validity of the WRCL for readiness was established by the research group and also the administrative staff in six nursing homes.

The WRCL appeared to be a valid tool (content validity and face validity) for the assessment of worksite readiness for implementation of worksite health promotion and health protection programs. The WRCL measures the level of readiness for successful health promotion programming by evaluating the management/organizational and physical environment of the workplace. The results from this pilot study may lead to the development of a more generalized format, with application to other types of organizations and industries.

Non-parametric analysis, qualitative of the instrument, and hypothesis testing support the use the WRCL as a valid and reliable instrument to measure worksite readiness towards health promotion and health protection programs. The results are consistent with those from other instruments like CHEW and Heart Check, which support the concept of health promoting environments and organizational support. [18, 19]

Employers have considerable control over the work environment and can make small but conscious decisions to change their employees' habits and behaviors with relative ease. Many employers, especially from small worksites (less than 500 employees), fail to understand the availability of existing resources perceive that wellness programs are necessarily expensive. [29]

The WRCL may be used as a valuable tool in identifying available resources for worksite health promotion and health protection programs.

Worksite Health Promotion and Occupational Safety practitioners may also use tools such as the WRCL to assess the readiness for WHP and implement programs in consultation with administrators and employees in a participatory approach integrating an ecological model. Further research is needed to establish the more general validity of this type of integrated instrument for assessing readiness. Some of the directions for future study with this instrument include the following:

- Modification to the existing WRCL instrument can be made to improve it s quality and possibly reduce the number of discrepancies in responses.

- Development of a more generalized format can be used to survey different types of sizes of workplaces.

- An action plan can be developed that guides the worksite towards appropriate planning of WHP depending on the responses to the WRCL and phasing in program implementation based on the global scores.

- An online version can be developed for ease of use of the instrument.

Further research is required to test this instrument in more sites to establish its usefulness and stronger validity in any worksite.

Limitations: One of the major limitations for this study was the number of sites used for the pilot test. More number of sites may be required to test this instrument for further validation.

Acknowledgments

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TITLE PAGE

a. Manuscript title: Assessment of a Worksite Health Promotion Readiness Checklist.

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Figure 1: WRCL-ADS Scores
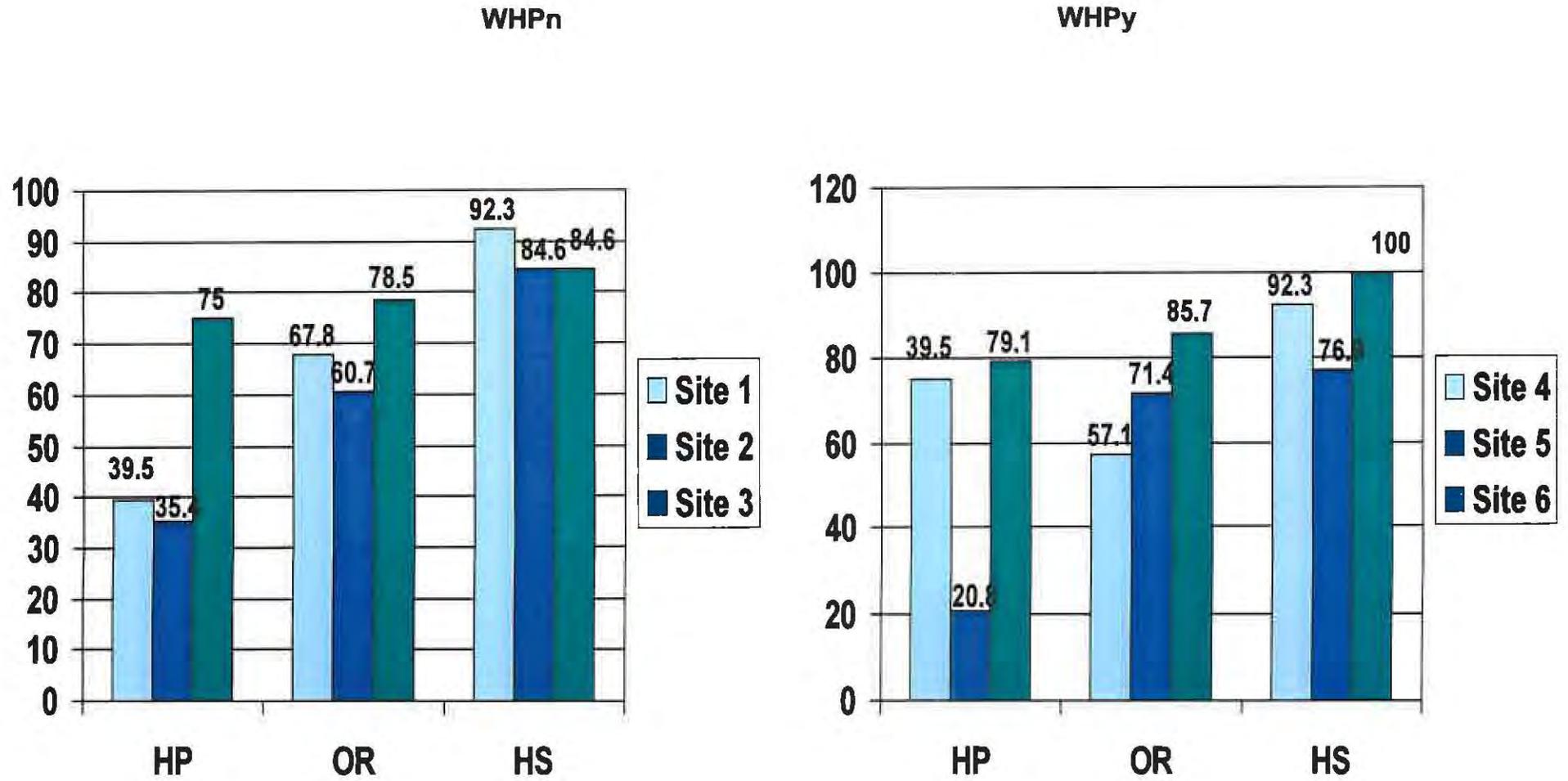
Figure 2 –WRCL-OBS Scores
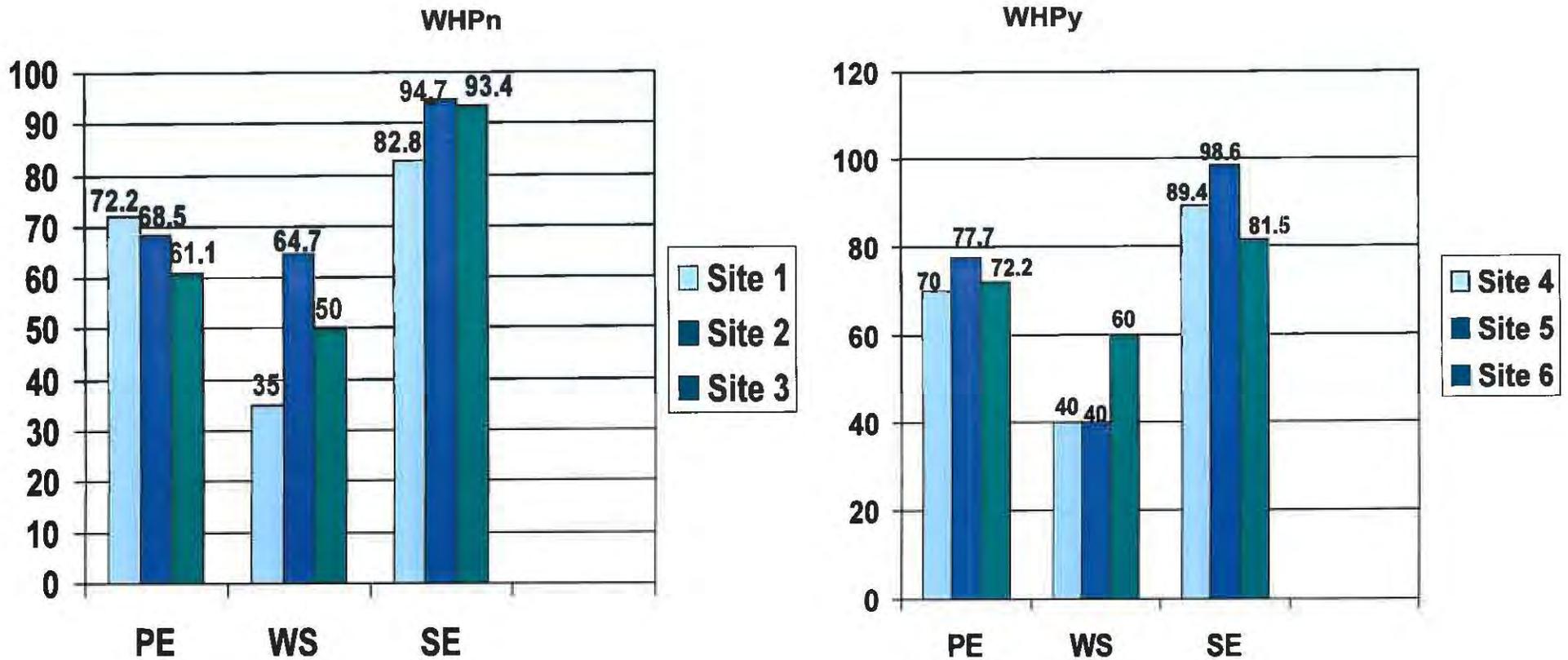
Table 1 – WRCL-ADS Sections

WRCL-ADS Sections	Topics covered	Number of items
Health Promotion (HP)	goals and mission related to health current health promotion activities wellness committee on-site wellness programs on-site health screenings health fairs educational sessions nutrition standards discounted meals and gym memberships drug testing smoking and alcohol abuse programs	21
Organizational Culture and Management (OR)	flexible work time number of scheduled meetings over lunch leave policies vacation time allowances break schedules at work	12
Health and Safety (HS)	medical emergency protocols assault prevention sexual harassment prevention OSH inspections educational materials on OHS communication on safety topics safety training injury reduction	12

Table 2: Criteria for Data Reduction

2	0	2	2	2	0	D/K	0	2	0
2	0	0	D/K	2	0	D/K	D/K	2	0
D/K	D/K	D/K	D/K	2	0	D/K	D/K	0	2
= 2	= 0	= 1	= 2	= 2	= 0	= 1	= 0	= 2	= 0

Where, **Yes = 2, No = 0, Don't Know = D/K**

Table 3 – WRCL-OBS Sections

WRCL-OBS Sections	Topics covered	Number of items
Physical Environment (PE)	general physical structure nutritional facilities exercise facilities signs& posters workplace surroundings	40
Work Setting (WS)	Structured exercise programs relaxation facilities Health and childcare Employee team sports Work pacing Team work	12
Safety Environment (SE)	Noise level Temperature Ergonomic specialist, Office safety specialist ergonomic Equipment Equipment organization Housekeeping	11

Table 4: Disagreement for WRCL-ADS

HP section Site 4	Does the workplace have a planning document or other written measurable goals and objectives for employee wellness?
HP section Site 4	Does the workplace have a designated Wellness champion?
HP section Site 1 & 2 Site 2 Site 2 & 3	Are opportunities for health promotion activities available to all employees: please answer all that apply? **All Shifts** **Part-time Workers** **Others**
HP section Site 1 & 2	Does the workplace have explicit policies or procedures that promote and support health promotion activities for employee health?
OR section Site 4 & 5	Does the workplace provide job flexibility for employees to participate in wellness activities?
OR section Site 4	Does the workplace have maternity leave after pregnancy/delivery or adoption (paid extended leave after short term disability payment ends)?
OR section Site 2, 4 & 5	Does the workplace provide leave policies that cover family emergencies/responsibilities beyond the family leave act (e.g., total or partial paid leave greater than 12 weeks)?
OR section Site 1 & 4	Does the workplace allow job rotations for employees?
HS section Site 5	Does the workplace have an injury reduction program?

Table 5: Disagreement between Observers

Safety environment (se) section	56c. Is soiled laundry in the hallways? 56d. Is there an odor of urine or excrement? 57. The overall housekeeping in this facility is Very good, Good, Bad, Very bad.
Work Setting (ws) section	58. Are there a number of nurses working in proximity to each other that could work together in teams? 59. Do the nurses who work in proximity to each other interact with each other? 62. Does the nursing staff appear to have time to take breaks and relax during their working hours?

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Dear Editor,

Dear Editor,
We greatly appreciate your consideration of this manuscript for publication in the journal of Occupational and Environmental Medicine. This worksite readiness checklist has been developed by me as the site Co-Principal Investigator of the Center of Excellence for Promoting Health in the New England Workplaces (CPH-NEW), as part of our center activities. Drs. Punnett and Cherniack who are the CO-PIs of the center were also involved with the development of this checklist as well as implementation and examination of its utility. They both are co-authors of the paper. Three of us are reviewers for the JOEM and we believe this research is a great fit for the Journal. The paper has been presented at APHA last year. Ms. Kotejoshyer and Mr. Reeves were graduate students working on this project.

Kind Regards,
Pouran D Faghri

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Engaging workers in health promotion and health protection efforts: A participatory approach for innovation and sustainability at two worksites

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Summary
An evidence-based approach to achieve more sustainable and effective workplace health promotion and protection programs is currently being tested by the *Center for Promotion of Health in the New England Workplace* (CPH-NEW; http://www.uml.edu/centers/CPH-NEW). Modeled after participatory ergonomics programs, small "design teams" of employees engage in iterative design of interventions to address their prioritized health concerns. An opportunity for employees to become stakeholders in these interventions is considered a key design factor for program success and sustainability. Program start-up depends on gaining both administrative and union support, assessing organizational readiness for participatory efforts, and creating meaningful support roles for supervisors. A multi-level steering committee with union and management representation is charged with supporting design team activities. Design teams initially focus on the health priorities revealed in survey responses to open-ended questions about work and non-work factors affecting health, and revealed in employee focus groups. Design team members receive training on teamwork skills and on basic principles of ergonomics and health promotion tailored to employee-selected health priorities. Ergonomic and health promotion professionals provide assistance as needed, such as helping make the business case for an intervention. The proposed integrated approach is expected to complement existing programs in ergonomics, health promotion, safety, and total quality management (TQM), and to support organizational change and innovation.

Background
As highlighted in a number of presentations at this *Second International Workshop on Work and Intervention Practices*, healthy organizations use a combination of proactive and compensatory approaches to manage employee health. The growing interest in workplace health promotion programs reflects a general recognition of the need to invest in more proactive approaches. However, despite significant investments in workplace health promotion programs to help employees develop healthy lifestyles during work and non-work hours, many of these programs are ineffective due to low rates of employee participation and a lack of sustainability.

The WorkLife Initiative by the United States National Institute for Occupational Safety and Health (NIOSH; http://www.cdc.gov/niosh/worklife) has funded three centers for research excellence to establish trans-disciplinary research, education, and translation programs to facilitate the integration of health protection and promotion in the workplace. In the *Center for the Promotion of Health in the New England Workplace* (CPH-NEW;

http://www.uml.edu/centers/cph-new/), a multidisciplinary team of researchers at two universities have developed the evidence-based approach described here that increases worker involvement in an integrated health protection and health promotion program.

A key feature of the CPH-NEW experimental approach currently being tested in field studies is to engage small design teams of employees in the iterative design of workplace interventions to address their prioritized health concerns. The program's dual focus on health protection and health promotion permits integrated approaches to be developed that complement conventional initiatives in workplace health protection (e.g., ergonomics, industrial hygiene, safety, etc.) and health promotion (e.g., assisting workers in improving health behaviors; exercise programs during work, etc.). Engaging employee design teams in the design of interventions is expected to greatly contribute to program sustainability because employees can become stakeholders in these interventions. Below we describe the conceptual basis of the approach, the role of design teams and potential benefits, the implementation strategy used in one of our field studies, and some preliminary evidence of program success.

Participatory Ergonomics for Health Protection and Health Promotion

Conventional workplace health promotion programs are generally top-down approaches for improving employee health because the choice of specific interventions for health promotion is often made by management and/or the professionals who run these programs. In addition, these interventions are typically "stand-alone" initiatives that seldom require integration with, nor changes to work organization. In contrast, the CPH-NEW approach advocates a bottom-up approach that addresses the influence of the organization of work on individuals' health attitudes and behaviors. Participatory ergonomics (PE) is one model of an approach to engage workers in bottom-up design efforts for improving employee health protection and health promotion, hereafter denoted as *PExHP* (Henning, Warren, Robertson et al., 2009). Conventional PE programs involve small groups of representative workers who receive training on ergonomics principles and then function in design teams and engage in iterative design of workplace interventions. This same approach is followed in a *PExHP* program except that the design team also receives training on principles of health promotion, group process, outreach to other employees, and evaluation of health impacts.

PE programs have been used successfully to address biomechanical issues such as repetition, force, static/awkward postures; psychosocial issues such as the need for autonomy and social support; and organizational issues involving complex sociotechnical systems (Imada, 2002; Haro & Kleiner, 2008). Although it is not unusual for conventional PE program activity to benefit worker health (e.g., Laitinen, Saari, Kivisto & Rasa, 1997; Vink, Koningsveld & Molenbroek, 2006), because this is explicitly a central goal of ergonomic design, to our knowledge it is unusual for programs of this type to focus additionally on the design of health promotion interventions. The *PExHP* approach shares features in common with a "health circles" approach popular in Europe, where employees are similarly engaged in seeking organizational solutions to health issues (Aust & Ducki, 2004; Bauer & Jenny, 2007). However, health circles do not typically seek to apply formal ergonomics principles nor to incorporate PE methods that have been so effective.

We see a number of advantages of engaging employees in a *PExHP* program. For one, methods for implementing successful PE programs are reasonably well established, with a number of useful tools and reports of lessons learned currently available in the literature; for example, a "participatory ergonomics blueprint" for guiding PE program implementation (Wells, Norman, & Frazer et al., 2003; Van Eerd, Cole, Irvin et al., 2008) and a framework for evaluation (Haines, Wilson, Vink & Koningsveld, 2002; Cole, Ribvilis, Van Eerd et al., 2005). As a sub-area of macroergonomics (Hendrick & Kleiner; 2002; Wilson & Haines, 1997), PE brings with it a conceptual framework and an ergonomic tool set for understanding and implementing changes in work organization. Another important advantage of using *PExHP* design teams consisting of representative employees who share jobs at the same level of the organization is that they are well positioned to identify and prioritize the most salient health hazards in these jobs. *PExHP* design teams so constituted also provide a forum where employees can speak more openly about health concerns, increasing the likelihood that a wide range of employee health concerns will be addressed. Additionally, small representative design teams can rapidly respond to changing conditions and health needs, regardless of whether these changes are caused by factors internal or external to the organization. Such agile organizational responses are desirable during periods of rapid organizational change and global economic uncertainty.

Another advantage to the proposed use of *PExHP* design teams is the potential for synergistic effects with other workplace programs, such as conventional safety programs and health promotion programs. *PExHP* design team activities are intended to complement rather than supplant the core functions of any such existing programs. For example, while safety committees are usually well equipped to identify workplace factors contributing to injuries or accidents, a *PExHP* design team might identify a source of workplace stress that negatively impacts employee sleep habits. An intervention by the *PExHP* design team that reduces this source of workplace stress may decrease the risk of workplace accidents caused by employee sleepiness. A health promotion program being informed of this stress problem by the *PExHP* design team might respond with a targeted health promotion intervention such as providing training in stress coping skills. Unique combinations of ergonomics interventions with health promotion interventions are also possible, such as tailoring job demands (e.g., to increase walking distances) and health promotion activities (e.g., provide materials so that employees can track their daily walking distance) to better complement one another.

Management might also consider supporting a *PExHP* program as a complement to an existing Total Quality Management (TQM) program. Use of *PExHP* design teams to identify and control health hazards is very similar to the TQM practice of using "quality circles" of workers to identify and solve quality control issues. Therefore, a natural synergy can develop between a TQM program and a *PExHP* program because the roles of employees and management have so much in common. Evidence that accident rates are lower in companies with active TQM programs has already been noted (Smith, 2002). It is also noteworthy that employee health promotion efforts parallel Deming's pioneering recommendation that management efforts should focus additionally on "upstream" quality factors (e.g., the raw materials delivered to a manufacturing facility; Robertson, Kleiner & O'Neill, 2002) since these can impact product quality. In an analogous manner, any behaviors affecting employee health, occurring either inside or outside of the workplace, can be considered "upstream factors" for maintaining employee health and safety during work activities. According to this logic, any lifestyle choices

of employees that cause ill health ("variance" in TQM) deserve the attention of management because of their potential to impair an employee's ability to perform quality work. Thus, the *PExHP* program being proposed is ideally suited to help fulfill the management need to preserve work quality through the identification and control of sources of employee ill health.

Implementation Strategy and Examples from Field Study

CPH-NEW has developed an implementation strategy for the *PExHP* approach that includes the following steps, with examples from an ongoing field study provided below:
1. Assess organizational readiness for participatory efforts (Reeves & Henning, 2008) and health promotion efforts
2. Formation of a multi-level steering committee for providing:
    - general oversight
    - top-down support
    - coordination of union support
    - feasibility evaluations of proposed interventions
    - resources, internal (e.g., time, equipment) & external (e.g., ergonomics training)
    - help with program evaluation
    - a clearinghouse for communication about the *PExHP* program
3. Formation and training of a representative *PExHP* "design team" of line workers
4. Creation of meaningful support roles for mid-level managers and supervisors.

<u>1. Assessing Organizational Readiness</u>
The host organization is a large, for-profit long term care provider based on the east coast. The sites on the study were not unionized. The intervention study was designed to compare the effectiveness of participatory (worker driven) versus traditional (management driven) ergonomics and wellness program activities on self reported health and psychosocial work environment indicators among care-giving staff in nursing homes.

Site selection was performed to screen prospective sites carefully for cooperative management style and willingness to try new programs. The goal was to identify approximately equivalent sites, any of which could be used for intervention or control sites. The selection process included open-ended interviews with the Administrator and Director of Nursing (the top management positions in nursing homes), the wellness coordinator (a volunteer role for an employee), and multiple focus groups with care giving staff (mostly certified nursing assistants, the largest category of nursing home job titles) in each site. Interviews with nursing home management focused on topics such as management/employee stability (turnover), quantity and quality of interaction between management and staff, responsiveness to employee concerns, opportunities for employee input and participation, interest in employee health and health promotion, and ability to schedule focus groups.

Focus groups consisting of 6-10 gerontological nursing assistant specialists (GNAs) were then conducted at each prospective site. The GNA designation is an elevated certification for certified nursing assistants (CNA), who are the mainstay of nursing home care-givers. Focus groups at each site consisted of two 90-minute meetings approximately 2 weeks apart, with the same group of participants. The purpose of these focus groups was two-fold: 1) to evaluate site readiness

and select 3 sites for the *PExHP* intervention, and 2) to identify key health concerns to inform future design team activities. Organizational readiness, employee interest, and the degree to which management understood the general health and safety concerns of workers were considered central to the selection process. The following are examples of topics discussed in focus groups: health concerns at work, opportunities for participation in decision-making within the organization, teamwork, qualities of an ideal nursing home, the importance of having quality time with residents, and work-life balance issues.

Focus group findings were resonant with survey data from a similar population of workers in an aggregate sample of nursing homes of the same host organization. The survey instrument combined the use of close-ended with open-ended questions to evaluate self-reported health status and to identify key health issues and organizational concerns. Open-ended questions focused on workplace and non-workplace factors that affect health, positively or negatively.

2. Formation of a Steering Committee
The formation of a multi-level steering committee was not feasible at each nursing home center because of the flatness of these organizations. Consequently, the center administrator and the director of nursing served in the role of an ad-hoc steering committee performing the roles listed above. As the *PExHP* design teams began their initial sessions, CPH-NEW researchers presented a brief overview on their activities at a meeting of supervisors and other center administrators, so that these ad-hoc steering committees and later the supervisors (unit managers at each center) would remain updated.

3. Formation and Training of P*ExHP* Design Teams
At the time of this conference, two of three intervention sites had established *PExHP* design teams which met every other week over the past three months. Team members were recruited from the previous focus groups and also from departments not represented in focus groups. At Site 1, the *PExHP* design team consisted of 6-8 gerontological nursing assistant (GNA) specialists. At Site 2, the *PExHP* design team consisted of 6-8 employees who represented CNAs, food services, housekeeping, and office staff.

During the first few meetings of the *PExHP* design teams at both sites, training was provided on group problem-solving and group decision-making techniques. For example, a set of meeting guidelines were put in place so that any new ideas or suggestions could receive full consideration, and training was provided for how to use a "decision wheel" for more organized decision making. In addition, employee health issues identified in focus groups and in a paper-based survey administered to all employees were prioritized. As an important component of organizational learning (Haims & Carayon, 1998), one goal in these initial meetings was to develop a "do-able" (i.e., easy) intervention that could help establish the roles of the *PExHP* design team and the steering committee within the overall program.

At Site 1, early meetings of the *PExHP* design team were lively with discussion about which single health issue to begin with. The group struggled with deciding the proper sequence for addressing nutrition, exercise, stress and communication/team work. This was captured in the words of one team member, "How can you eat healthy and exercise without first reducing stress; or vice versa?" The design team's first intervention project was to improve quality of the foods

in the vending machines in the staff break room. Working on this project helped establish a working relationship between the *PExHP* design team and the steering committee (center administrator and director of nursing), and so it served to promote organizational learning, as discussed above. For a second intervention at Site 1, the design team chose to cultivate a small vegetable garden on the grounds of the nursing home. Although an unconventional choice, design team members felt that this activity would relieve stress, promote healthy eating, provide exercise, and build a spirit of team work and improved communication between nurses and CNAs. CPH-NEW researchers worked with the steering committee to secure donations from area merchants and in-kind consultation from local farm and garden experts. One obstacle that emerged was the fragile confidence of the *PExHP* design team members regarding successful completion of the project. During the period when CPH-NEW researchers were making community contacts, team members attending meetings would ask, "The garden is not going to happen, right? Nothing ever changes." This outlook apparently was rooted in a long history of workers making suggestions with no action following. CPH-NEW researchers assured team members that progress was being made, and set a date for building the garden. Design team members recruited the building department to construct forms for the raised beds, and the team and one CPH-NEW researcher then built and planted the beds. Although planted late in the New England growing season (July 28), the garden was successful – with cherry tomatoes, basil and kale growing quickly. It created a great deal of interest and pride among team members and other staff. Team members set up a schedule for checking the garden, watering, as well as how the harvest would be distributed. The team is discussing what tasks need to be done to prepare for the next growing season and to get more people involved. Early benefits of the gardening project include the following:

- Positive feelings of accomplishment and pride
- Established trust and optimism about future team projects
- Gained the support of the management
- Gardening provided health benefits—relaxation, physical activity, stretching
- Members of the *PExHP* design team learned about organic gardening methods
- One new team member was recruited through the garden activity
- Scheduling of gardening activities provides a reason to train team members on the ergonomics of active rest and optimal break scheduling.

At Site 2, nutrition, exercise, and the quality of life of residents were the top health issues selected by the *PExHP* design team. Similar to Site 1, improving vending machine food offerings was the first design team intervention at this site, and it was similarly successful in regard to obtaining healthier foods. CPH-NEW researchers took advantage of the health theme of and provided training materials on nutritional foods. Team members created and administered a survey for employees of the types of foods they wanted in the machines. They used the responses to negotiate with the vending company to stock machines with salads, fresh fruit, and sandwiches for a two-week trial. The team discussed how to notify other employees about the new food in the machines and to encourage them to use it. One person volunteered to write the flyer; another agreed to print it on her color printer; another agreed to post notices around the building. At the time of this presentation, a trial period is underway.

The second, more challenging intervention chosen by the design team at Site 2 was to create a walking path on the grounds of the nursing home to make it possible for employees, residents,

and family members to walk (some residents would need wheelchairs) outdoors despite the proximity of the nursing home to a busy highway. This project had been rejected in the past because of high cost. The *PExHP* design team requested a meeting with the center administrator and the building maintenance manager to propose that the project be reconsidered if a less costly alternative could be developed. The working relationship forged between the center administrator and *PExHP* team members during the vending machine intervention helped make this meeting possible. The design team was able to obtain budget and planning details from the original walking path design that had been rejected. Working from this previous design plan, the design team reconfigured the path to avoid costly lighting and non-critical construction. Team members wrote a proposal for the new design, complete with photographs and projected costs, which they will present to the center administrator for consideration. Some expected benefits of the proposed walking path are as follows:

- Provides a facility upgrade (important for marketing purposes)
- Combines relaxation/stress reduction with physical activity
- Accessible to both employees and residents, together or separate
- Satisfies popular and recommended health promotion activity—walking
- Provides opportunity to apply ergonomics of active rest and optimal break scheduling
- Lends itself to using pedometers to motivate participation, evaluate walking progress.

4. Support Roles for Mid-level Managers and Supervisors

It is crucial for program success that center managers and/or unit managers commit to providing resources for the *PExHP* design team. This includes making the necessary arrangements for the design team to meet and be trained, and to be flexible in work scheduling so that intervention activities are possible. The center administrator should reward and recognize the *PExHP* design team's efforts as well as the unit manager's support efforts.

Training for managers and mid-level supervisors should include an orientation to the program, including discussion of short and long-term goals, specific role descriptions and expectations by senior managers, functions of the steering committee, and anticipated activities of the *PExHP* design team. Managers and mid-level supervisors will need to receive regular communications regarding any steering committee actions and new activities of *PExHP* design team.

Remaining Challenges

Although early *PExHP* design activities at Sites 1 and 2 appear to be on a good trajectory, a number of challenges still remain before long-term sustainability of these programs will be achieved:

1. Fostering positive management/design team relationships. Communication between the *PExHP* design teams and center management was not ideal. For example, the center administrator could not always provide a timely response to the design team on budget questions, and teams were not aware of the center administrator's "crunch times" when she was not in a position to respond. This can be considered a drawback to not having a formal steering committee for communication and marshalling needed resources to support the design team. Perhaps some formal arrangement will need to be established that links *PExHP* design team activities with other center priorities, and alternative

communication pathways will need to be developed. A related issue is the logistical difficulty in organizing meetings of unit managers, for communication or to work with them on quality of supervision.

2. Building Sustainable Leadership. Early in the design team's development, CPH-NEW researchers assumed a substantial amount of responsibility leading team meetings, doing background research and leg work for the interventions, and communicating with the center administrator to obtain necessary permissions and resources. A transition is planned whereby design team members will be expected to take a more active leadership role while CPH-NEW researchers transition to more consultation and support roles.

3. Providing ongoing training and education. Site managers and design teams will need ongoing training in several domains to maintain enthusiasm, build skills, and assure intervention quality and commitment to the program. Example training needs are program planning and evaluation methods, wellness best practices, use of community resources, and macroergonomics for organizational change (Robertson, 2002).

4. Developing short-term and long-term evaluation measures. CPH-NEW researchers and teams need to work together to assure that the necessary data is collected over multiple years to enable employee health outcome evaluations. Management will need to verify program effectiveness and impact (e.g., lower absenteeism, lower turnover, higher morale, quality of care, etc.) to maintain their enthusiasm and commitment to the program. Also, measures of the *PExHP design* process need to be logged which can allow the host organization to transfer lessons learned to other nursing home centers in the organization.

5. Training for *PExHP* design teams only. Design teams will need ongoing education to expand their skills in teamwork, project management, process and outcome evaluation methods, root cause analysis, membership recruitment, building a business case for wellness activities, and on the relationship between work organization, ergonomics and other occupational safety and health topics, publicity, and state of the art wellness programs in health care.

Conclusions

The scientific and conceptual basis for a more participatory approach to health protection and health promotion in the workplace was presented in which employees take a more active role and become stakeholders in workplace interventions. This bottom-up approach uses participatory ergonomics to engage employee teams in the design of workplace interventions to address salient health concerns they have identified. These small design teams then test and refine their proposed interventions in an iterative manner, in keeping with good ergonomic practice. Top-down management support for the program is required. As members throughout the organization begin to assume a proactive role in the management of employee health, organizational learning must take place for the overall approach to be successful. Examples of organizational learning during the start-up phase of an ongoing field study were provided to clarify implementation methods and the nature of employee-led interventions at long term care facilities. Early results at two field sites are promising, with employees already taking an active role in planning and implementing workplace health protection and health promotion activities. One of the remaining research challenges is to find additional ways of guiding and supporting these programs so they become self sustaining.

Acknowledgement

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Violence at workplace increases the risk of musculoskeletal pain among nursing home workers

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Word count: 3182

What this paper adds:

- Musculoskeletal symptoms are very prevalent among workers in the health care industry

- Workplace violence is a frequent and considerable workplace hazard, particularly in long-term care units, such as nursing homes.

- The role of workplace violence as a risk factor for musculoskeletal symptoms in health care workers has rarely been investigated.

- This study shows a dose-response association between the number of physical assaults and the prevalence of musculoskeletal pain in nursing home workers.

- Good workplace safety in nursing homes is likely to protect against the adverse effects of violence.

ABSTRACT

Despite the high prevalences of both workplace physical violence and musculoskeletal symptoms among health care workers, very few studies have examined the relation between these two phenomena. We surveyed 920 clinical nursing home workers by questionnaire regarding musculoskeletal pain in the low back, shoulders, wrists or hands, and knees. Information was also collected on exposure to physical assaults at work during the preceding 3 months, other workplace safety features, physical workload and psychosocial work environment. Log-binomial regression was used to estimate the prevalence ratios (PR) with 95% confidence intervals (95% CI). Almost one-half of respondents reported being assaulted at least once during the preceding 3 months by a resident or resident's visitor. The prevalence of low back pain increased from 40% among non-assaulted workers up to 70% among those assaulted 3 or more times. The highest risk was found for widespread pain (3 or more areas), with an adjusted PR of 2.7 (95% CI 1.8-3.9) for workers assaulted 3 or more times. Good workplace safety buffered the effects, so that violence increased the risk of most pains considerably less in a work environment perceived to be safe. To our knowledge, this is the first study to show a dose-response association between physical assaults and musculoskeletal pain in a health care setting where violence is a frequent occurrence. This emphasizes the need to address violence as a workplace hazard through practical measures for prevention as well as in future etiological research on musculoskeletal disorders.

INTRODUCTION

Musculoskeletal symptoms are very common among workers in the health care industry [1-3]. In a large Norwegian study, nine out of ten nurse aides had experienced pain during the preceding 2 weeks, most often in the low back [4]. Approximately every fifth nursing home worker is absent from work every year because of neck and shoulder complaints [2]. Several work-related risk factors have been identified in relation to musculoskeletal pain in this sector, especially frequent lifting, and twisting and bending related to patient transfer. Also psychosocial risk factors are frequently reported, such as low social support at work, low job satisfaction and night shift work [1,3,5].

Another important stressor in this sector is workplace violence. Health care workers experience violence at work frequently, and considerably more often than in other industries. Employers in the state of California reported that the annual rate of non-fatal assaults was 465 per 100 000 hospital workers, much higher than the rate of 83 for all workers [6]. Almost half of all nonfatal injuries from violent acts against U.S. workers occur in the health care sector [7], and the most assaulted worker in the U.S. is the aide working in a nursing home [8]. Official reports, however, are known to underestimate the frequency of assaults, and the true prevalence of workplace violence is still unknown [9-10]. Based on self-reports, up to 70% of the nursing home staff are assaulted at least once a month [11-13]. The increasing rates of workplace violence have induced a public discussion about an 'epidemic' of violence against healthcare workers [6,14].

Thus far, epidemiological studies on the health consequences of workplace violence are scarce and mainly focused on mental health outcomes [15-16]. Psychological reactions such as anger, sadness, frustration, irritability, fear, self-blame, and depressiveness are frequently experienced among the assaulted workers [11, 17-18]. Of the physical symptoms, fatigue, sleep problems, and headache are most often reported. Very few studies have examined whether musculoskeletal symptoms are also

more prevalent among the violently abused workers and which anatomical areas are most affected. The causal link between workplace violence and musculoskeletal pain is biologically highly plausible; in addition to scratches and bruises that cause pain, violence-induced stress may delay tissue healing, as well as alter adaptation mechanisms by affecting individual pain threshold and tolerance [19-20].

The aim of this epidemiologic study was to investigate the association between physical assaults and musculoskeletal pain among nursing home workers, and whether good workplace safety modified (buffered) the association.

METHODS

Study population and study design

This cross-sectional study is based on a large, on-going multicenter research project examining the effectiveness of worksite programs that combine occupational safety and health interventions with health promotion (The Center for the Promotion of Health in the New England Workplace). The study was approved by the Institutional Review Board of the University of Massachusetts Lowell and began in May 2006. The study population consisted of all permanent full-and part-time clinical employees in 12 nursing homes within a single company, located in Maryland and Maine, U.S.A. All clinical staff members were eligible to participate in the study; office, laundry, food service, and janitorial staff were not eligible, nor were clinical staff from temporary agencies.

The self-administered baseline questionnaire was distributed and collected by the members of the study team between May 2006 and November 2007, prior to initiation of a "no-lift" program. For those workers who could not be met in person, such as third-shift and weekend employees, a pre-

stamped, addressed return envelope was provided. Compensation of twenty dollars was offered in exchange for each questionnaire that was completed and returned with an informed consent form.

The questionnaire collected information on demographic characteristics (e.g., age, gender, length of education, ethnic origin), working conditions, current and recent health endpoints (physician-diagnosed diabetes, hypertension, spinal disorder, or elevated cholesterol), health locus of control and self-efficacy, and health behaviors. Most questions were based on previously published and validated items and scales.

Musculoskeletal symptoms

The outcome of this study was self-reported musculoskeletal symptoms. Workers were asked whether they had experienced pain or aching during the preceding 3 months in the low back, shoulders, wrists or hands, and knees (1 = yes; 0 = no). The particular body areas were indicated on the questionnaire by a body map diagram. The pain information from the 4 areas was summed (score ranging from 0 to 4). Those with the sum index of 3 or 4 were categorized as having widespread pain (reference category: 0-2 pain areas). In addition, severity of low back pain (only) was obtained with a separate item using 5 categories from 'no pain' to 'extreme pain'. For the dichotomous variable, 'moderate and extreme pain' were combined and compared to 'no pain or mild pain'.

Working conditions

Information about physical assaults at the workplace was elicited with the following question: "In the past 3 months, have you been hit, kicked, grabbed, shoved, pushed or scratched by a patient, patient's visitor or family member while you were at work?" The response categories were: no, not

at all; 1 time; 2 times; 3 times; more than 3 times. After review of the response distribution, a 3-class variable was formed: $0 =$ no; $1 = 1$-2 times; $2 = 3$ or more times.

The questionnaire assessed a number of other work characteristics that were considered relevant for musculoskeletal symptoms. Psychosocial factors were psychological job demands, job control, co-worker support, and supervisor support (all 2 items each, selected from the Job Content Questionnaire (JCQ) [21]. Physical requirements at work were: moving or lifting heavy loads (1 item, JCQ); rapid and continuous physical activity (1 item, JCQ); and awkward postures (3 items, JCQ). The sum of these 3 exposures was defined as 'physically demanding work.' Regular night work was obtained from 1 question on usual work shift. Work-family interference was assessed with the sum of 3 items: 'After work I come home too tired to do some of the things I'd like to do', 'On the job, I have so much work to do that it takes away from my personal interests', and 'My family and/or friends dislike how often I am preoccupied with my work while I am at home' [22]. Perceived workplace safety was assessed with the sum of 4 items ('I am often required to do a task that makes me feel like I might be at risk of getting hurt', 'My work area is adequately staffed', 'People working in my department or unit are frequently exposed to dangerous or risky situations', and 'In this facility, management considers workplace health and safety to be important') [23].

Data analysis

Associations between musculoskeletal symptoms and the exposures were assessed with log-binomial regression to estimate prevalence ratios (PR) with 95% confidence intervals (CI). If the log-binomial model failed to converge then the COPY method was used [24]. If the COPY method resulted in potentially unstable estimates, a Poisson estimate was calculated and compared to the COPY method estimates. In the multivariable modeling, all models included age (except if age-stratified), gender, and those additional covariates that were associated with both the outcome and

the exposure. Regular night work and co-worker support were not included in the final models because they showed no associations with the independent variable.

Our secondary hypothesis was that good workplace safety may buffer the effects of physical assaults on musculoskeletal pain. Therefore, a 5-class composite variable (1 = no assaults to 5 = being assaulted 3 or more times in a workplace with poor safety) was used to estimate the risk of pain, adjusted for the same variables as the main analyses. Statistical significance was also tested for the interaction term for violence and safety climate. The statistical analyses were carried out with the statistical software package SAS (version 9.1, SAS Institute Inc, Cary, NC, USA).

RESULTS

Questionnaires were received from a total of 920 nursing home staff members, of whom 93% were direct providers of clinical care. The number of the respondents per nursing home varied from 49 to 180. The most common occupational titles were certified nursing aide (CNA, n=459 [50%]), certified medicine aide (CMA, n=110 [12%]), licensed practical nurse (LPN, n=153 [17%]) and registered nurse (RN n=129 [14%]).

The response rate was 72% of all eligible clinical staff listed on the workforce rosters (unweighted average of all 12 centers). We were unable to obtain an exact count of the eligible employees who were at work during the days the study team was on site, but from qualitative estimation it is likely that about 90% of those individuals returned questionnaires.

A total of 867 survey respondents provided information on age and gender; they were almost half mostly female (92%) and African-American in origin (47%). The average age was 42 years, (standard deviation (SD) 13). These characteristics were almost identical to those of the total

clinical workforce. The average number of years worked in the same type of job was 12 years (SD 10), but one in four workers reported more than 19 years of seniority. Self-reported lifetime experience in the same type of work was 6 to 8 years higher than seniority in the current job (from workforce rosters). About one-half worked primarily full-time (53%), and on day shifts (47%), consistent with the overall staffing patterns of these centers.

The prevalence of having been assaulted 1 or 2 times during the preceding 3 months was 26% and 3 or more times 22%. Workers younger than 40 years were more often exposed to physical assaults than older workers (55% vs. 44%) and nursing assistants more often than other workers (56% vs. 37%). By ethnic origin, the prevalence of recent assault was higher among non-Latino workers (50%) than Latinos (42%). Among those with 1-5, 6-15 and more than 15 years' of experience in the current occupation, the prevalence of assaults during the preceding 3 months was 49%, 54%, and 44%, respectively.

The 3-month prevalence of pain in any of the body areas increased with the number of assaults (Figure 1). In age- and gender-adjusted models, widespread pain was three times more prevalent among those reporting 3 or more assaults, compared to no assaults. The largest absolute increase (30%) was seen for the prevalence of low back pain (Table 1). Adjustment for multiple covariates had relatively little effect on the risk estimates (Table 2). The risk of knee pain was higher among the younger workers whereas the risk of shoulder pain and widespread pain was higher among the older workers. When the severity of low back pain was used as an outcome, the associations with violence were stronger: e.g., the age-and gender-adjusted PRs in Table 1 increased from 1.2 and 1.6 to 1.4 (1.1-1.8) and 1.8 (1.4-2.2), respectively.

Many workers who were exposed to violent assaults also reported a less safe work environment (Table 3). Moreover, those who perceived the safety of their workplace to be less safe were almost

twice as likely to consider leaving the job in the next 2 years compared to those working in a good safety climate (age- and gender-adjusted PR 1.8, 95%CI 1.5-2.1). The combination of poorer workplace safety and violent assaults was associated with an increased risk of pain in most areas, being highest for widespread pain. Being assaulted in a safer work environment increased the risks less, if at all. The interaction term for violence and safety climate had a p-value level of greater than 0.05 for each of the outcome variables.

Table 1. Age- and gender-adjusted associations between violent assaults and musculoskeletal pain, n=841 (prevalence ratio, PR, with 95% confidence interval, 95%CI)

	LBP		Shoulder pain		Wrist/hand pain		Knee pain		Widespread pain	
	PR*	95%CI	PR*	95%CI	PR*	95%CI	PR*	95%CI	PR*	95%CI
Violent assaults										
No assaults	1.0		1.0		1.0		1.0		1.0	
1-2 assaults	1.2	1.0-1.4	1.1	0.9-1.5	1.4	1.0-2.0	1.3	1.0-1.7	1.6	1.0-2.4
3 or more assaults	1.6	1.4-1.8	1.8	1.4-2.3	2.1	1.5-2.8	1.5	1.2-1.9	3.0	2.1-4.3

*adjusted for age and gender

Table 2. Multivariable models of the associations between violent assaults and musculoskeletal pain among all subjects and by age group (all: n=758; <40 years: n=352; > 40 years: n=406)

	No.of exposed	LBP		Shoulder pain		Wrist/hand pain		Knee pain		Widespread pain	
		PR*	95%CI	PR*	95%CI	PR*	95%CI	PR*	95%CI	PR*	95%CI
Violent assaults						All subjects					
No assaults	386	1.0		1.0		1.0		1.0		1.0	
1-2 assaults	195	1.2	1.0-1.4	1.1	0.8-1.4	1.4	1.0-2.0	1.3	1.0-1.7	1.5	1.0-2.2
3 or more assaults	177	1.5	1.2-1.7	1.6	1.2-2.1	2.1	1.5-2.8	1.3	1.0-1.7	2.7	1.8-3.9
						Younger than 40 years					
No assaults	160	1.0		1.0		1.0		1.0		1.0	
1-2 assaults	84	1.2	1.0-1.6	0.9	0.5-1.4	1.2	0.6-2.2	1.2	0.7-1.9	1.0	0.5-2.1
3 or more assaults	108	1.6	1.3-2.0	1.2	0.8-1.9	1.7	0.9-3.0	1.4	0.9-2.2	1.9	1.0-3.5
						40 years or older					
No assaults	226	1.0		1.0		1.0		1.0		1.0	
1-2 assaults	111	1.1	0.9-1.4	1.1	0.8-1.6	1.5	1.0-2.2	1.4	1.1-1.9	1.8	1.1-2.9
3 or more assaults	69	1.5	1.1-1.8	1.9	1.3-2.7	2.0	1.4-2.8	1.1	0.8-1.7	3.0	1.8-4.9

*adjusted for age (if not stratified), gender, ethnic background, education, organizational unit, physical demands of work, psychological demands of work, job control, supervisor support, and work-family imbalance.

Table 3. Violent assaults in a workplace and workplace safety in relation to musculoskeletal pain, n=758.

	No. of exposed	LBP		Shoulder pain		Wrist/hand pain		Knee pain		Widespread pain	
		PR*	95%CI	PR*	95%CI	PR*	95%CI	PR*	95%CI	PR*	95%CI
Workplace safety and violent assaults											
No assaults	386	1.0		1.0		1.0		1.0		1.0	
Exposed to 1-2 assaults in a safe workplace	103	1.1	0.9-1.4	0.9	0.6-1.4	1.4	1.0-2.2	1.1	0.8-1.6	1.1	0.6-2.0
Exposed to 3 or more assaults in a safe workplace	68	1.4	1.2-1.7	1.3	0.9-2.0	1.5	0.9-2.5	0.9	0.6-1.5	2.1	1.2-3.8
Exposed to 1-2 assaults in a less safe workplace	92	1.2	1.0-1.5	1.2	0.8-1.7	1.4	1.0-2.2	1.6	1.2-2.1	1.8	1.1-2.9
Exposed to 3 or more assaults in a less safe workplace	109	1.5	1.2-1.8	1.8	1.3-2.5	2.4	1.7-3.3	1.5	1.1-2.1	3.0	2.0-4.5

*adjusted for age, gender, ethnic background, education, organizational unit, physical demands of work, psychological demands of work, job control, supervisor support, and work-family imbalance

DISCUSSION

Nursing home workers are frequently assaulted physically by the residents for whom they care, or by residents' visitors or family members. In our study of almost 1,000 workers, one out of two had experienced such an incident at least once within the preceding 3 months, and one out of four was assaulted several times. This high period prevalence is consistent with earlier studies among nursing home workers, although some studies have reported even higher estimates, e.g., up to 70% of the staff being assaulted at least once a month [11,13]. In one of the few investigations to compute incidence rates, Myers et al. reported that nurses and aides in a dual-diagnosis facility sustained 67.3 assaults per 100 person-years [25]. Approximately half of all nursing home workers are injured at least once during their career due to an assault [13].

Within the health care sector, certified nursing assistants and other nurse aides are most frequently exposed to violence [11]. In our study, aides were also most often the target, although other workers in direct and frequent contact with the patients, such as nurses, also experienced assaults frequently. In our study, as well as in earlier research [10], those who were less educated, younger and with fewer years in nursing work were assaulted more often. Increasing experience in nursing work may improve adaptation, control of time, patience, empathy and coping strategies [10]. Alternatively, fewer assaults among older workers may be the result of a (self)-selection out of direct care jobs [26]. Violence may at least partly explain the considerably high employee turnover rates (25% to 150% annually) in nursing homes [27].

Workplace violence has other consequences besides high turnover. It has been associated with reduced productivity, increased absenteeism and counselling costs, decreased staff morale, and reduced quality of life [26]. Psychological reactions like anger, sadness, frustration, irritability, fear, self-blame, helplessness and depression are also frequently experienced [11, 17]. Post-traumatic

stress disorder is also not uncommon among assaulted workers [18]. Among physical symptoms, fatigue, sleep problems, and headache are reported most often.

It appears that musculoskeletal symptoms have rarely been assessed as an outcome of workplace violence, although Myers reported a weak increase in back and shoulder problems among nursing home staff caring for physically abusive or resistant individuals on evening and night shifts [28]. In our study, the 3-month prevalence of musculoskeletal pain was relatively high (range 21-52% by body region). These figures are consistent with earlier studies of nursing home workers as well as other physically demanding occupations, such as kitchen work [3,29-30]. A new finding is the dose-response relationship between violent assaults and pain: the prevalence of pain increased linearly with the increasing number of assaults, being on average double or even triple among those assaulted 3 or more times. The risk was even higher when low back pain cases were restricted to those with more severe pain. After adjusting for several covariates, the largest increase, three-fold, was detected among the older workers with widespread pain.

Although we found no major difference in the frequency of physical assaults between the workplaces that were perceived to be generally safe or not, having been assaulted increased the risk of most pains mainly in the non-safe environment. Violence creates a stressful work environment, but stress can probably be decreased with measures such as improving the physical environment to better accommodate the nursing home residents, as well as workers' behavioral management skills training, better co-worker and supervisor support, and management's demonstrated priority on workplace safety. Safe workplace may also lower the turnover rate. This is supported by the finding in our study that those reporting poorer workplace safety were more often considering leaving the job in the next 2 years.

The mechanism(s) by which exposure to workplace violence might cause musculoskeletal pain are unclear. While some pain may result directly from scratches, cuts, and bruises, this does not seem to account for the magnitude of the associations observed. One plausible explanation could be related to stress and consequent delayed tissue healing, as well as altered pain tolerance. The particularly high risks related to widespread pain supports this assumption. Finestone recently addressed the links between psychological and social factors and recovery from musculoskeletal injuries, identifying the biochemical and physiological processes that mediate this relationship [19]. Several animal and human studies have demonstrated that exposure to stress can exaggerate subsequent pain experience and lower pain thresholds [31,32]. Frequent and prolonged threats of violence may produce constant anticipation of pain, which itself may even be worse than the actual pain experience [33]. Resent functional magnetic resonance imaging studies have demonstrated that already the anticipation of pain causes activation in the pain-sensitive areas in the cortex of the brain [34]. Cumulative stress has been associated with a number of physiologic changes in the brain and body that reflect dysregulated hormonal and autonomic activity. Exposure to violence is likely to increase vulnerability to the somatic pain syndromes such as fibromyalgia and temporomandibular disorder and also to contribute to symptom expression and severity [20].

This study has both strengths and limitations. The survey response rate was relatively high among those who were at work during the days that the investigators were on site, and participants were very similar to the entire workforce in age, gender, race/ethnicity, and the distribution of clinical job titles between aides and nurses. Job stress has shown to reduce survey participation among health care workers [35]. In our study, such a selection effect (i.e., lower participation by those experiencing violence and feeling stressed about it) would most likely have led to an underestimation of the associations reported here.

The associations would also be diluted if there were non-differential exposure misclassification, in this case meaning misclassification of workers' reported assault history. While it seems unlikely that a worker would not recall whether or not such incidents had occurred during the preceding 3 months, recurring events might reduce her/his ability to quantify accurately the number of assaults. Moreover, differential misclassification of the exposure could cause bias away from the null value. For example, those without any symptoms might recall their prior assault history more accurately. Some subjects may have a reporting behavior such that leads to a higher reporting both of exposure and adverse health symptoms, and hence, to overestimated risk estimates. To be certain of excluding these biases, a cohort study starting from a symptom-free population is needed. However, this would require a very large study size, given the high prevalence of musculoskeletal symptoms among nursing home workers.

Survey reports of assault cannot be reliably validated against formal reports because official workplace injury reports and compensation claims by definition exclude assaults without a physical manifestation or with only minor injury. Hence, official reports and compensation claims are likely to provide underestimation of the true frequency of workplace assaults, and survey data are often presumed to give more reliable estimates of violent incidents. It has been estimated that 55-90% of violent episodes are not officially reported [9,25,26,36,37]. There are many reasons for worker under-reporting, in addition to the absence of physical injury or lost work time; some of these are common to injury reporting in general: lack of reporting policies and practices; reporting considered to be too time-consuming; doubts about the benefit of reporting; the perception that assaults are to be expected in this job; and feeling sorry for the patients or residents [8, 38]. Also, concerns that assaults may be viewed as a result of poor job performance or worker negligence may lead to fears about job security. Thus, violence may be less often reported by casual, temporary and part-time workers who, according to some surveys, experience more assaults [39]. In studies using administrative records only, the risk of assault was reported to be higher among full-time workers,

compared to per diem or pool agency staff [25], and among those who were working in their usual unit and shift [28]. These associations may be true or they may result from differential under-reporting.

Although the temporal sequence of violence and pain cannot be confirmed with cross-sectional study design, several features of this study support that workplace violence is a causal factor for musculoskeletal pain: strength of the associations with dose-response effect; relatively high risk estimates that did not change with adjustment for multiple covariates (reducing the likelihood of alternative explanation); and a plausible mechanism. More observational studies are needed to investigate prospectively the role of violence in musculoskeletal symptoms and particularly whether experiencing physical assaults leads to prolonged or more severe symptoms, and eventually to disability. One form of workplace violence not assessed in our study is verbal abuse. It is known to occur even more frequently than physical violence in nursing work [26] and its health effects deserve further attention from occupational researchers. Intervention studies that aim at reducing any form of workplace violence and improving workplace safety in order to decrease the occurrence of musculoskeletal symptoms are also warranted.

Healthcare is the largest sector in the U.S. economy, accounting for over 3% of the total U.S. labor force with almost 11 million employees. Long-term care represents a large and growing segment of healthcare, so the high prevalence of hazards in this work has important public health consequences. This is the first study to show a dose-response association between physical assaults and musculoskeletal pain in a health care sub-sector in which violence is a frequent and considerable workplace hazard. This emphasizes the need to address workplace violence in future etiological research as well as to implement violence prevention in long-term care practice. Musculoskeletal disorders are a leading reason for sick leaves and permanent disability in most

occupations, particularly in health care. Good workplace safety in nursing homes is likely to protect against these and many other adverse effects of violence.

CONFLICTS OF INTEREST

None declared.

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FIGURE LEGEND

Figure 1. Exposure to physical assaults at workplace and the prevalence of musculoskeletal pain (both measured during the 3 preceding months), n=889

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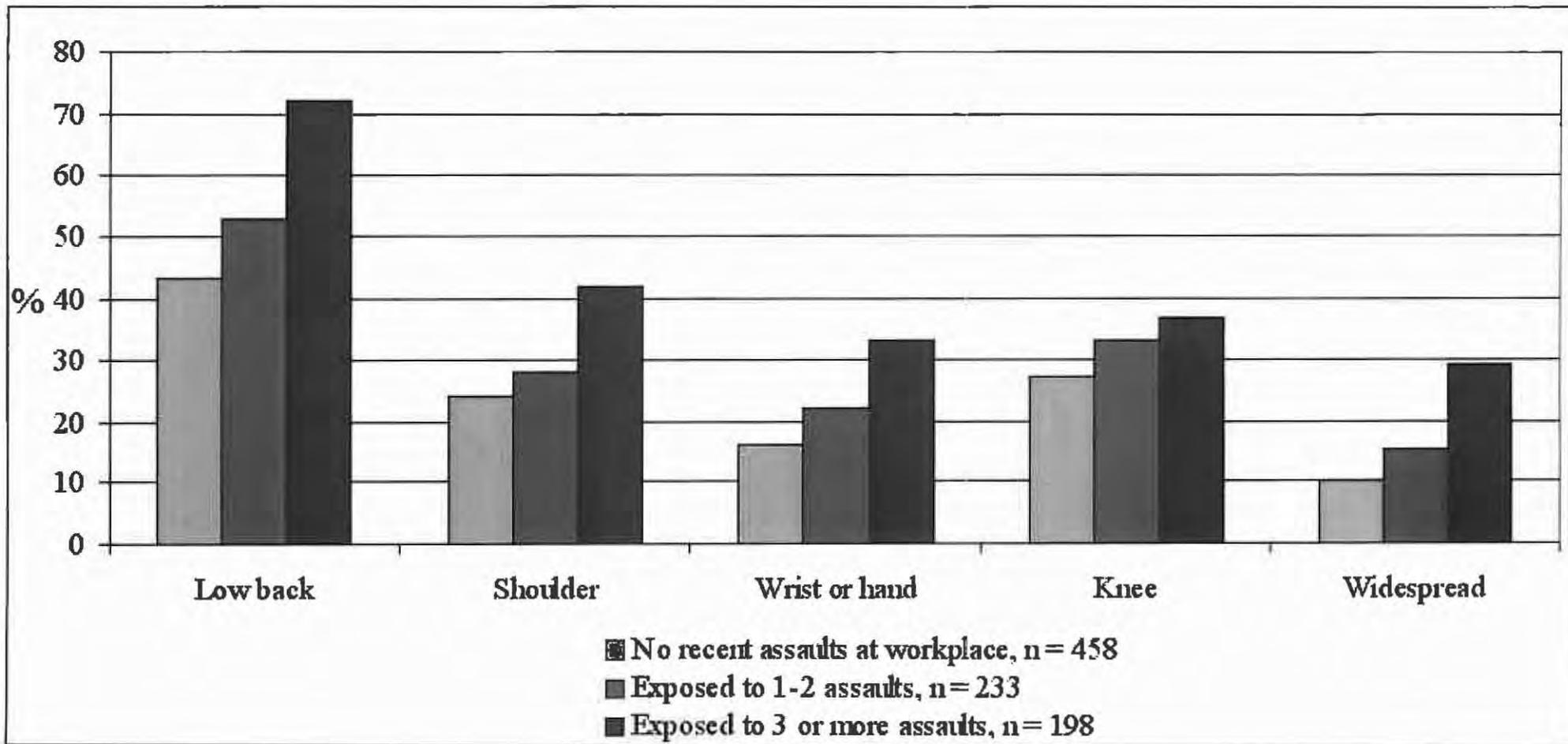
| | Low back | Shoulder | Wrist or hand | Knee | Widespread |

No recent assaults at workplace, n = 458
Exposed to 1-2 assaults, n = 233
Exposed to 3 or more assaults, n = 198

Barriers to workplace stress interventions in employee assistance practice: EAP perspectives

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Barriers to workplace stress interventions

Acknowledgements

This manuscript has not been submitted nor published in any other trade or peer reviewed journal.

Barriers to workplace stress interventions

Abstract

Occupational health literature links stressful working conditions with cardiovascular and other chronic diseases, injuries, and psychological distress. We conducted individual interviews with Employee Assistance Professionals (EAPs) to understand opportunities and barriers for EAPs to address job stress through organization level interventions. EAPs described their primary role as assisting individual employees versus designing company wide interventions. The most salient barriers to organization level interventions cited were lack of access to company management and (for contracted EAPs) perceptions of contract vulnerability. Education about workplace stress interventions may be most effectively directed at EAPs who are already integrated with company level work groups.

Barriers to workplace stress interventions

Background

Job stress is defined as the harmful physical and emotional responses that occur when the requirements of the job do not match the capabilities, resources, or needs of the worker (NIOSH, 1999). Psychosocial work stressors may operate at several levels, from organizational policies and practices in companies (e.g. labor policies, production processes, technology, culture, and climate) to job-level issues experienced by employees (e.g. work station fit, interpersonal relations, task characteristics). Specific examples of organization-level stressors include downsizing, contingent work (temporary workers, piece work), extreme temperature and noise, machine-paced work, unrealistic or unpredictable production goals, shift work, poor communication, harassment, and discrimination. Examples of job-level stressors include excessive work load, lack of decision making authority, repetitive tasks, long work hours, immobility (constant sitting/standing), poor relations with co-workers and/or supervisors, unsafe or ill-fitting work stations, role ambiguity, inability to use skills, and lack of growth and learning opportunities.

The evidence for the health impacts of excessive, sustained exposure to workplace stressors is well established for musculoskeletal disorders (especially physical stressors), mental & psychological health, and cardiovascular disease (Belkic, Landsbergis, Schnall, & Baker, 2004; LaMontagne, Keegel, Vallance, Ostry, & Wolfe, 2008). Pathways by which psychosocial stressors can lead to disease are direct (by producing physiological responses such as elevated blood pressure and cortisol levels) and indirect (by producing changes in health behavior). The impacts on work related

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endpoints such as productivity, absenteeism, and disability are also of prime concern to employers.

The occupational health literature on the topic of job stress has burgeoned over the past 40 years. The literature specifically focused on workplace interventions reaches back to the 1960's and continues to the present. Interventions generally fall into the following categories: person-based (assisting individuals who are having trouble with stress to cope better or change their response to stressors), job- or task-based (altering the content of the job or the immediate social environment of the work group), and organization-based (attempting to reduce or eliminate stressors at their source) (Karasek, 1992). Examples of person-based interventions, which are often facilitated by Employee Assistance Professionals, include counseling and communications related training in conflict resolution, assertiveness, diversity/discrimination/harassment/bullying awareness, team-building, and supervisory skills. Job-level interventions seek to improve physical or psychosocial conditions of the person-work interface, such as control, skill use, workload; examples could include job enlargement, job rotation, role clarification, and work station redesign. Organization level interventions typically address work policies or production processes -- management styles, worker participation in quality initiatives, production process redesign, flexible work arrangements, diversity initiatives, and career ladders, to name a few.

In the occupational health arena, changing organizational policies and management practices is an example of an "engineering control" whereby the hazard itself is removed to prevent exposure at the source. Intervention research studies have demonstrated that intervening at the organizational level is essential for controlling

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Barriers to workplace stress interventions

stressors at their source and for seeing improved health and work outcomes
(LaMontagne, Keegel, Louie, Ostry, & Landsbergis, 2007).

Our research center, with federal grant support, initiated a multi-year education
and dissemination project to educate health professionals (defined broadly) on the
importance of addressing working conditions as part of comprehensive chronic disease
prevention programs. Employee Assistance Professionals emerged as a natural
audience and potential partner, based on their workplace focus and expertise in
addressing psychosocial problems of employees. EAPs may be well positioned to
champion the issue of job stress prevention in an organizational setting because of
several strengths: professional focus on employee health and wellbeing; problem
identification in the workplace; alignment of EAP goals with company business goals for
performance, productivity, and maximized human capital; and professional training in
human behavior.

According to the International Employee Assistance Professionals Association
(IEAPA, 2009), Employee assistance programs by definition help employers address
productivity issues on two levels: they advise the leadership of work organizations and
they help "employee clients" in identifying and resolving a broad range of personal
concerns, including occupational stress, that may affect job performance. Theoretically,
therefore, the EAP is well positioned to help companies deal with workplace stress on
two levels--advising company leaders about strategies for preventing exposures to
workplace stressors, and helping individual employees to manage their responses to
stressors that are not amenable to being "designed out" of the job. In the
accompanying article we review the Employee Assistance literature on job stress, which

shows at least a two decade history of interest in this topic among EA professionals (Azaroff, manuscript under JWBH review). We estimated one published article per year that focused attention on the work organizations as 1) the root source of work related stress, and/or 2) the appropriate target for interventions to reduce stress related illness in the workplace. Despite a few articles that vigorously encourage EAPs to focus both on organizational and individual interventions to combat workplace stress, we were unable to find accounts of organization level interventions led by EAPs. It was our goal to explore whether this dual approach was actually used in contemporary EA practice and learn how EAPs perceived their scope of influence in client companies for reducing employee exposures to workplace stressors.

Methods

Telephone and face-to-face interviews were conducted individually with New England EA practitioners between January 2007 and May 2008. A convenience sample was recruited through personal contacts with members of the local chapter of Employee Assistance Professionals Association (EAPA). Care was taken to recruit EAPs working in a variety of settings: large and small employers from various industry sectors; EAPs employed on salary by their client companies (internal EAPs) and EAPs who were self employed or employed by firms providing contracted EA services (external EAPs); programs. The interviews were designed to take 45-60 minutes to complete. All participants completed informed consent. Two researchers were present for each interview; one facilitated the discussion, while the other took notes. Interviews were

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audio taped so that quotes and detailed explanations could be captured verbatim. The interview script and procedures were approved through the UML Institutional Review Board for the protection of human subjects.

A structured questionnaire was followed to assure consistency of content discussed between subjects. Questions were designed to explore EA perceptions and practices in the following domains: EAP role (areas of responsibility, typical problems they address); awareness of work stress as a risk factor for cardiovascular diseases; methods used to help employees and organizations address workplace stressors; perceptions about which interventions are within and outside of their scope of control; and the nature of the EAP interaction with client organizations. Additionally, practitioners were asked where they seek credible information about advances in EAP practice, as well as their preferred professional education formats and materials. The latter questions were designed to help guide the development of educational tools and outreach strategies but results are not presented here. Interview recruitment continued with new participants suggested by interviewees until saturation was achieved, meaning that no new issues emerged from the data (Strauss & Corbin, 2008).

Results

Participants were nine EA practitioners (3 male, 6 female) currently employed and providing services in a variety of industrial sectors including government, healthcare, utilities, manufacturing, education, professional services, and others. Participants were experienced in their profession (range 10 to 30 years) and had worked in multiple settings throughout their careers. Six participants were CEAP

certified (Certified Employee Assistance Professional) and one was a Labor Assistance Professional (serves an EAP function within a labor union). Four participants were employed on-site at their client company ("internal" or "staff" model EAP), two were employed by contracted behavioral health firms and were housed on-site at client companies; and three were employed by behavioral health firms providing contracted services "off-site" to client companies (also called "external" or "network model" EA programs). Several interviewees had worked for both internal and external EA programs during their careers.

1. Knowledge of workplace stress as a risk factor for chronic disease

EA practitioners spoke with ease about the correlation between stress and poor health and readily acknowledged the work environment as a potent contributor to stress in their employee clients. As one practitioner expressed it, "The more stressed out you are, the higher the likelihood to have illness—vulnerability increases." Slightly more than one-half of practitioners spontaneously listed stress as a risk factor for cardiovascular disease. Despite this awareness, only two practitioners spoke of specific pathways leading to disease (e.g. direct physiological response, behavioral impacts) or could recall examples in EAP professional literature that specifically described the work stress and CVD correlation.

2. Prevalence of stress as an important occupational health issue

Across all interviews, stress (from any source) was discussed as the number one reason that employees initiate contact with EA programs. Whether the presenting problems were rooted in personal issues (family conflicts, financial difficulties, etc.) or

work related issues tended to vary by whether the EA practitioner was "internal" or "external" to the organization. Those working for an internal program tended to report work-related stress as a bigger proportion of cases than those working through contract off-site. These results are consistent with trends seen in the EA literature (Csiernik & Adams, 2002). Common work-related issues discussed included work overload, understaffing, interpersonal conflicts with co-workers or supervisors, and organizational changes (usually lay-offs). (Csiernik & Adams, 2002)

3. Perceptions about EAP roles for dealing with job stress

EA practitioners were unanimous in reporting that their primary role was to assist employee clients with assessing the source of their problems and to help clients to develop a plan to cope more effectively. Practitioners emphasized the importance of enabling employees to bring about positive change in their work environment for themselves. Only two practitioners discussed specific instances in which they actively worked with an employee and supervisor together to negotiate changes in job tasks or the working environment. (This was only done after the employee signed a waiver to assure that confidentiality was not breached.) The willingness of some EA counselors to mediate discussions between employees and supervisors may have been a function of prior professional experience and personal comfort level (e.g. some were experienced in marriage counseling or family mediation). Most practitioners said instead that they prefer to help employees in a coaching role.

In addition to assisting individual employees cope with job stress, EA practitioners (particularly those with account management responsibilities) described

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several other services they provide to client companies that could directly address workplace stressors at the level of the organization. This was particularly true for EAPs who served dual roles as both account manager and counselor, as they were in a position to interact directly with personnel from their client company. Organization-level service roles included supervisor consultations to resolve employee performance problems, providing aggregate statistics and trends on presenting problems, notifying human resources managers about emerging clusters of problem issues, and providing training to supervisors and employee groups on workplace issues related to stress such as conflict resolution, communication skills, relationships, time management, and personal stress management techniques.

4. Perceived barriers to implementing organization level stress interventions

Several themes emerged surrounding EA practitioners' roles for dealing with job stress, and what was within versus beyond their scope of influence.

a. Lack of interest and commitment from the client company –Despite having a range of services to offer, most of the EA interview participants expressed feelings that their services were underutilized by client companies. Although it is an EAP standard of practice to track and report aggregate statistics on presenting issues (IEAPA, 2009), most EA practitioners interviewed felt that company managers use these data primarily to assess overall utilization (% of workforce using EA services), without analyzing the content for program planning purposes. Practitioners themselves viewed these data as an important tool for recommending training programs for employees and supervisors,

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and some did report feeling effective at being able to reach groups of employees through training programs.

However, practitioners also expressed frustration that their training programs were not always accessible to all segments of the workforce. For instance, white collar workers were more likely to attend, whereas the hourly workers tended not to attend, due to schedule restrictions. One EAP serving a manufacturing firm expressed it this way: *"It's ironic—the people who need it (stress reduction training) the most don't have time to do it. The hourly employees have a 17 minute lunch. They are working on a time crunch. When you're on the clock, there's a whole other stress involved there."*

b. Lack of access to senior managers— Mutual trust in relationships with senior managers was viewed by EAPs as a crucial prerequisite for being able to provide service and influence at the organizational level. There were two main obstacles identified by EAPs. The first relates to structural positioning within the organizational hierarchy, meaning towhom in the organization does the EAP report? The higher up the corporate ladder the company's EAP reports, the more priority and credibility will be given to the program, and the more opportunity the EA practitioner will have to be in discussions about workforce training, support, and development, labor policies, health benefits, and organizational climate. According to one veteran EA practitioner, *"A good EAP tries to report to the highest authority within the organization. I develop relations within all departments—security, human resources, benefits, medical, senior management. I go out of my way to be invited to the table so that I can be involved at the table when decisions are being made."*

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A second issue related to structural positioning is whether the EAP program is "internal" (staff model) or "external" (network model) to the client organization. This topic was salient for every interview participant. EA practitioners who were employed full time "in-house" (by their client company) tended to report being able to work closely with all levels of the management chain. In contrast, EA professionals who were employed by a contracted benefits firm (network model) did not enjoy this same level of access to company managers. Contracted EAP counselors said they primarily interacted with employees of the client companies and interacted occasionally with supervisors who referred an employee for performance reasons. Contracted EAP counselors who also served as account managers did report interacting with their client company liaison, although frequency of interactions varied. Company liaisons were almost always benefits or human resources managers (or a medical director, who also may be contracted),but not a senior executive.

c. Perceptions about contract vulnerability— By definition, working under contract is a temporary arrangement. Contracts for EA services can be changed or terminated by client companies, and this vulnerability can provide an incentive to avoid potential pitfalls related to organization level stress interventions. Two "external" EAPs in our sample discussed their experiences with this issue. One example is the potential for the EAP program to be identified as the catalyst behind new demands of labor unions and other types of employee push-back. In unionized companies, labor agreements often require that all grievances about working conditions are brought to the union steward. Although this arrangement is necessary for maintaining the collective bargaining strength for unions, it can pit the interests of the employee clients against those of the

contracted EA provider. One EAP expressed reluctance to refer employees to the union to resolve work-related problems. For this EAP, it was vital not to jeopardize the firm's contract by potentially being named as the catalyst behind a union grievance. "*We can't do any kind of outreach/involvement in that manner [referring employees to their union]. I need to keep asking the employee—who can you talk to?—I can't tell them you should do so-and-so.*"

Another possible pitfall for pursuing an organization-level stress reduction initiative relates to the possibility that lawsuits and compensation claims could be filed by employees if they were to attribute their disability or illness to work-related stress. It is reasonable for EAPs and company managers (and lawyers) alike to view work stress as a sensitive topic, and attempting to address it in a visible way could invite unintended consequences. As one EAP put it, "*According to [the legal teams within the organization], you don't want to put ideas in the employees' heads that work is creating those problems.*"

d. Territorial tension between departments—One last issue that was identified by EAPs housed on-site was the issue of functional competition between departments of the same company. This was particularly prevalent in larger companies where various employee-focused departments vied for resources and recognition in terms of services provided, budget allocated, and generally the question of "whose turf" is the appropriate locus for addressing workplace stress. One EAP described the importance of staying within the EAP's defined roles for counseling and group training, and avoiding "stepping on toes" of other departments which had responsibility for settling work grievances (human resources) and managing conflicts within departmental work groups

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(organizational development). Another EAP serving a large firm described getting clear direction from her superiors to refer all issues related to working conditions to the union. A change in senior management similarly was described as an impediment to building trusting relationships with senior level advocates, which in turn, set the stage for competition between departments.

Discussion

This qualitative study explored how EAPs view their roles for addressing workplace stress as well as opportunities and barriers for EAPs to intervene on an organizational level to address unhealthy workplace stressors. Insights gained from interviews will help inform decisions about future partnerships for education and collaboration with employee assistance professional groups. Several strengths inherent in EA practice were identified that could be brought to bear for organizational interventions aimed at improving the psychosocial working environment. The ability to coach and counsel employees and supervisors, commitment to confidentiality, tracking of data on presenting problems, and expertise on human behavior and interpersonal relationships are strengths that can be applied on several levels. These include guiding management decisions on labor policies, work organization, workforce development, and workplace culture; assisting management with assessment of psychosocial workplace hazards; helping with the design and development of psychologically healthy management standards and jobs; training employees and supervisors on

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communication, conflict resolution, role clarification, and other social aspects of work organization; and integrating behavioral health perspectives with program planning.

These expanded roles require that the EAP is trained and competent in a core set of organizational and occupational topics, as is required through CEAP certification, which has become an industry standard for EAP consultants (IEAPA, 2009). There are also examples of roles that have been proposed by others in the EAP literature reviewed in the accompanying article (Azaroff, manuscript under JWBH review) as appropriate and promising strategies for EAPs to address occupational stressors at their source so that psychosocial "exposures" are reduced. Shain (1996) and Beidel (2005) have also emphasized the importance of forming alliances with specialists in occupational health and safety, health promotion, and human resources, so that complementary skill sets can be brought together to address psychosocial (and physical) hazards in the work environment.

While the opportunities for organizational impact theoretically are great, it was clear from our interviews that participants viewed their primary role as helping individual employees (and their dependents) with solving problems so they can return to full productivity. This view point is supported by our companion literature review, which showed that many articles for and about EAPs focus on individual (vs. environmental) sources of stressors, and many articles on interventions (even if they recognize workplace sources) focus on helping individuals as the proper role for EAPs (Azaroff, manuscript under JWBH review). Similarly, our results echo the literature on several issues: lost opportunities to use aggregate data to guide company program planning, perceptions that contracts can create conflicts of interest between serving two clients—

employees and employers, and interdepartmental competition and related tension between the need for EAPs to collaborate with others in the corporate hierarchy while at the same time avoiding perceptions of unwanted intrusion.

Despite the apparent emphasis on treating the employee client, many practitioners did express a desire to impact the broader psychosocial work environment of their client companies. In some cases EAPs expressed frustration that companies do not utilize their services to a fuller extent. While market pricing drives companies (and therefore EAPs) to focus on utilization of counseling services as the key metric for evaluating EA program success (Csiernik, 1999), several EAPs discussed the importance of building relationships with a broad array of departments as means of internal marketing with the goal of imbedding their presence into the larger corporate structure. The paradox here is that EAPs who desire broader engagement within their client organizations, especially those working under contract, may find it difficult to be compensated for this level of service if it is not explicitly purchased by their client companies. For EAPs whose services are bundled and sold along with a broader array of health and medical services, the market pressure to offer more services for "free" makes it especially difficult to spend the time needed to provide organization level advice and consultation to their client companies (Worster, 2009).

No practitioners in this study described their EAP program as having visible, high-level support from senior management. This is consistent with EAPs' perceptions about being underutilized, and it is also consistent with the distal reporting position of most EAP programs relative to senior management. This goes to the heart of the most

significant barrier described by EAPs for being able to intervene on an organizational level—lack of access to senior managers.

The issue of EAP positioning has been discussed extensively in the EA literature in relationship to a two-decade trend in which companies have moved from offering internal programs to purchasing contracted EAP services (Beidel, 2005; Brummett, 2000; Csiernik & Adams, 2002; Leong & Every, 1997). This trend has resulted in counseling services being delivered more often by telephone than in person, migration of mental and behavioral health expertise away from the workplace management structure, the bundling of mental health services with health benefits, downward price pressure for EA services, consolidation/acquisition of smaller EA firms by larger ones, and attrition (through retirement and downsizing) in the EA workforce nationwide with concomitant reductions in academic EAP preparatory programs necessary for training future practitioners. All of these trends have been described in a recent article in the Journal of Employee Assistance (Sharar, 2009) and have given rise to a key question of EAP identity circulating in the EA professional community which is, "Should EAPs be in the world of work or in the world of healthcare?" The former concept positions EAPs as an essential component of management policy-making and the latter positions EA services as an a la carte offering to a larger set of health benefits available for purchase. This issue of professional identity was poignantly captured by one EAP in our interviews: *"A real EAP sees the organization as the client. Somebody's who is a mental health provider sees the client in front of them as their client. That's the big difference."*

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Where, then, does that leave the EAP as a potential change agent for addressing job stress at the organization level? The answer likely depends on a number of factors. EAPs of internal programs probably stand a better chance to stimulate workplace changes than EAPs of external programs. If the EA program has been outsourced it will be more difficult to address work organization issues with management unless the EA provider negotiates for a management consultation role in their contract. The outsourcing itself could indicate a de-coupling of mental health with the company's business goals. EAPs who have established strong ties with senior managers probably have more influence concerning workplace changes than EAPs in organizations where senior manager positions have turned over and/or where serious organizational restructuring has taken place. EAPs working in companies with a strong team culture, and who have at least some history working cross-functionally with other departments, probably have a conducive climate for workplace changes compared with EAPs in organizations where competition and turf wars are common. Lastly, EAPs in unionized companies that encourage joint efforts with labor leaders probably have a better chance for intervening organizationally than EAPs in companies that restrict this type of labor-management collaboration.

One factor that may create more demand for "preventive" EA services on the organizational level is the trend toward a focus on health promotion (wellness) and disease prevention in the workplace. With advancing recognition that health behavior is responsible for a great deal of chronic diseases (which therefore affects productivity) more employers may fund employee wellness programs and focus their health insurance purchases to cover more preventive services. In this context, incorporating

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workplace stress reduction as a risk reduction strategy for disease and poor performance is a logical support to a company's business goals. The concept of integrating preventive work organization measures with health promotion in the workplace is a core principle of program evaluation within the current Work Life Initiative (NIOSH, 2009) within the National Institute for Occupational Safety and Health (and which is the current sponsor of the authors' research center). A strong business case can be made that creating a healthy work environment is crucial in the long term for meeting business goals of healthcare cost containment and work productivity. EAPs and other workplace health professionals have an important role to play for educating employers about the causal association between workplace stressors and poor health and work outcomes and recommending strategies for intervention.

When interpreting the results of this study, two weaknesses related to the study sample may suggest caution. The first issue is small sample size and the second is sampling method. Although study participants numbered only nine, there was a high degree of consistency in responses for most questions. On the one hand, this may indicate that EAPs have a standard set of content knowledge and work experiences despite having come from a range of work settings. An alternative explanation is that the sample may not have been diverse enough to capture different points of view. For example, including more labor assistance professionals (our sample included only one LAP) may have generated more examples of organization level interventions to reduce stress. As leaders within organized labor, LAPs theoretically are in a position to recommend specific labor policies and standards that can be incorporated during union contract negotiations with employers.

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Our sampling method relied heavily on "snowball sampling" in which the first few participants recommend other colleagues for participation. As a result, all of the study participants were members of their local chapter of Employee Assistance Professionals Association (EAPA) and also had longevity in the field. Presumably, both EAPA membership and longevity would indicate a high level of professional commitment as well as ongoing training and professional development (and possibly self-efficacy in practice skills). If so, our study results would likely overestimate, not underestimate EAPs' confidence in making workplace changes to combat stress. This is important because as EA practice has shifted more towards a "network or external" model of EA practice, younger professionals likely feel less able to influence work organization than more experienced professionals.

Conclusion

This qualitative study provided many valuable insights on how EAP practitioners perceive their ability to address work-related stress through interventions aimed at the individual and the organization. Substantial barriers exist for EAPs to engage employers in primary prevention related to workplace stress: lack of access to company managers (and often the worksite itself), lack of knowledge regarding intervention methods, and perceptions regarding contract vulnerability all play into the difficulty of functioning in this manner. These findings are all consistent with published literature for and about EAPs.

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Occupational health educators interested providing job stress intervention should consider directing their training efforts at business leaders directly to increase support for the notion that creating a healthy physical and social work environment is consistent with achieving with their business goals. Training efforts directed at worksite health personnel such as EAPs and others would be most effective for practitioners who are already integrated into company work groups, and who have an established working relationship with company managers, and/or have opportunities to join cross functional work groups based on a company culture that fosters continuous quality improvement. In the absence of social policy that requires companies to meet specific standards related to workplace stress, having a conducive climate for making workplace changes is essential. Training should include principles of healthy work organization and job design, workplace assessment, and strategies for facilitating workplace changes. With top management support, we feel that EAPs working together with other key personnel, could be very effective at intervening to address many sources of workplace stressors. We welcome opportunities to partner with groups of workplace health practitioners on future education and intervention activities that focus on primary prevention strategies for reducing workplace stressors. We also invite responses from EAPs and other medical and behavioral health specialists who are interested in continuing dialogue on this topic.

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How Does the SF-36 Perform in Healthy Populations?

A Structured Review of Longitudinal Studies

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Abstract

This paper examines the stability of the Medical Outcomes Study short form (SF-36) in healthy populations. The researchers conducted a structured review of longitudinal studies that reported the use of SF-36 among people in their active working years ages 18 to 65. The cumulative sample size across selected studies was 29,868 participants. SF-36 mean scores were similar to published U.S. aggregate norms. Gender-specific changes in SF-36 scores also followed a normative trend, with women having greater declines in scores (poorer health) than men. The SF-36 was stable among healthy populations; however, its use among healthy people requires caution particularly when considering the longitudinal effects of age.

Key words: SF-36, healthy populations, stability, aging

Background

The Medical Outcomes Study short form (SF-36) questionnaire is widely used for measuring health-related quality of life (HRQL) in various settings. Applications of the SF-36 include health policy evaluations, clinical practice and research, health intervention evaluations, and a general population surveying (Hemingway, Stafford, Stansfeld, Shipley, & Marmot, 1997; Ware & Sherbourne, 1992). Studies have implied that the SF-36 is valid, reliable, and suitable for HRQL measurement (Ware, 2000; Abbott, Hobby, & Cotter, 2006). The SF-36 has been used in different countries, and similar conclusions about reliability, validity and stability have been reported (Hemingway et al., 1997; Hopman, Berger, Joseph, Towheed , VandenKerkhof , & Anastassiades, et al., 2006; Thumboo, Cheung, & Machin, 2005).

Despite its widespread use among people with chronic and acute health conditions, there has been little documentation regarding the ways in which the SF-36 performs among healthy populations assessed prospectively (Hopman et al., 2004; Perneger, Etter, & Rougemont, 1997; Ware, Kosinski, & Gandek, 2005). As a consequence, there has been limited understanding of the natural history of HRQL as measured by the SF-36 (Hopman et al., 2004). One result has been difficulty in estimating within-person changes that may be the consequence of natural aging or customary life events (Abbott et al., 2006).

This study sought to provide some insight into the stability of the SF-36 when used as a repeated measure in healthy populations. In this study, stability of the SF-36 was considered the consistency and continuous proportionality of all the components of the SF-36 in different subgroups over time. Simply stated, we would like to know if this metric can record similar scores for all its components when used over different time periods. Using a structured literature review approach, the researchers examined the characteristics of change in SF-36 scores in

studies where there has been retesting of a healthy cohort of adults. The researchers also examined changes in regard to gender and age.

The SF-36 Health Survey

The SF-36 questionnaire measures HRQL with eight subscales: Physical Functioning (PF), Physical Role (RP), Bodily Pain (BP), General Health (GH), Vitality (VT), Social Functioning (SF), Emotional Role (ER), and Mental Health (MH; Ware et al., 2005). Scores for each variable are summed and transformed into a Likert scale ranging from 0 (*worst*) to 100 (*best*; Jenkinson, Coulter, & Wright, 1993). The SF-36 was first developed and tested for the Medical Outcomes Study (MOS), a 2-year study of chronic medical conditions (Ware & Sherbourne, 1992). Its validity and reliability have been tested in various studies (McHorney, Ware, Lu, & Sherbourne, 1994; McHorney, Ware, Rogers, Raczek, & Lu, 1992; Ware & Sherbourne, 1992). It was developed for people above the age of 14 and can be administered by telephone, by self, or by a trained interviewer.

Methods

Strategy for Study Selection

The process of identifying articles was completed in five steps:

Step 1: Bibliographic databases were searched for studies using SF-36 as a measurement tool in longitudinal studies. Databases that were searched included Web of Science, Scopus, Pub Med, Scirus, Cochrane, Health and Wellness Resource Center, Sociological Abstracts, PsycInfo, Psychology and Behavioral Sciences Collection, ABI/INFORM Global, Academic Search Premier, PsycArticles, Psychology: A Sage Full-Text Collection, EBSCOhost, ECON LIT, POPLINE, ProQuest Dissertations & Theses, and the SF-36 database. Search key words were SF-36 AND longitudinal, SF-36 and prospective, SF-36 AND longitudinal AND prospective.

Step 2: A total of 35 potentially relevant abstracts were selected for further review based on the initial search.

Step 3: Identified abstracts were reviewed by all three researchers to determine articles to be included in a structured review based on the following inclusion criteria: (a) use of the SF-36 as a repeated measures instrument in a longitudinal or prospective study; (b)) studies carried out in healthy populations, not populations of patients or those with chronic or acute health conditions; and (c) studies carried out among people in their active working years of 18 to 65. Based on these criteria, 18 potentially suitable articles were identified.

Step 4: The 18 studies that met the inclusion criteria were retrieved and reviewed. Four studies were excluded because of failure to meet one or more inclusion criteria that were not appreciable from the abstract.

Step 5: Eight studies were removed for other reasons, such as the use of a form of treatment, an intervention, or other features resulting in noncomparability. The six remaining papers included two papers from one study that were reported at different follow-up points. The selected studies were entered into a data rubric.

Data Preparation and Analysis

Because of the small number of studies, the analyses were primarily descriptive. Preliminary calculations were done using SF-26 scores to obtain mean change scores that were further interpreted. Analysis of the effects of age was limited to the two studies that recorded SF-36 scores by age group. Table 1 presents the characteristics of the studies selected for the analysis.

Table 1

Characteristics of Studies

Study	Country	Population	Time interval (years)	Age bracket	Baseline sample	Follow-up sample
Mishra et al., 2004	Australia	Population based	2	45-50	12,137	12,245
Perneger et al., 1997	Switzerland	Community based	1	15-45+	1007	851
Thumboo et al., 2005	Singapore	Population based	2	18-44	NI	1923
Hopman et al., 2006	Canada	Population based	5	25-64#	4,875	4,281
Hopman et al., 2004	Canada	Population based	3	40-59	2,949	2,619
Hemingway et al., 1997	United Kingdom	Nonindustrial civil servants	3	35-55		
Men					5763	5467
Women					2586	5467

Note: NI– Not Included # excluded age groups > 64 in this analysis.

Calculation of Mean SF-36 Scores

Only one study, Perneger et al. (1997), reported overall sample mean SF-36 scores. The other studies reported their scores solely for subgroups within their samples. For the studies that reported scores by subgroup, the researchers computed an overall sample mean for baseline and follow-up scores by taking an average of the subgroup scores.

The Thumboo et al. (2005) study was a population-based cohort study of ethnic Chinese listed in the electoral register in a district in Singapore. The researchers examined whether being bilingual in English and Chinese influenced changes in HRQL scale scores. The SF-36 scores were delineated as English speaking, bilingual or monolingual, and Chinese speaking, bilingual or monolingual. Consequently, there were four baseline and four follow-up scores. To obtain the overall mean SF-36 scores, the four subgroup scores were averaged weighting for sample size. Overall baseline and follow-up SF-36 scores were derived by combining the average of all recorded SF-36 scores for each language category.

The Mishra et al. (2003) study was population-based. The researchers examined changes in women's well-being and health service use in terms of socioeconomic status (as cited in Mishra, Ball, Dobson, & Byles, 2004). They reported SF-36 mean scores by socioeconomic level: low, middle and high. Overall baseline and follow-up SF-36 scores were derived by calculating the average of all recorded SF-36 scores. The Whitehall study conducted by Hemingway et al. (1997) reported gender-specific SF-36 mean scores. Overall baseline and follow up SF-36 scores were derived by computing the average of all recorded gender-specific SF-36 scores. Three studies reported gender-specific data (Hemingway et al., 1997; Hopman et al., 2004, 2006). Hemingway et al. only reported total mean SF-36 scores, whereas the two studies conducted by Hopman et al. reported changes in SF-36 scores only by subscale. For this manuscript, the researchers calculated average change in SF-36 scores for each subscale and by gender.

To examine how the SF-36 performed across age groups, average change in SF-36 was obtained by computing the mean of the change scores for each age group. Only two studies reported scores by age group. Scores were reported by major subscales. For comparison purposes, SF-36 scores were delineated by the following age brackets: < 44, 45 to 54, and 55 to 64. Data from the Whitehall Study (Hemingway et al., 1997) were presented as two separate studies because they had already been stratified by gender.

Results

Description of Quality of Life

Table 2 presents the four studies that reported mean SF-36 subscale scores at baseline and follow-up. Scores were generally high, indicating good HRQL, an expected finding in healthy cohorts. The mean subscale scores for all the studies at baseline were as follows: PF of 87, PR of

84, BP of 78, GH of 72, VT of 61, SF of 84, ER of 82, and MH of 73. At follow-up, the scores were as follows: PF at 86, PR at 82, BP at 77, GH at 71, VT at 60, SF at 83, ER at 81, and MH at 72. Table 2 also includes normative data on SF-36 reference values reported for the United States (Thumboo et al., 2005). The scores for each subscale in this review were consistent with the American SF-36 normative subscale scores. This was evident both at baseline and in the follow-up scores.

Stability across Populations

Tables 2 and 3 also present mean values at the initial and last survey; the intertest difference is presented as mean change score. Hopman et al. (2004, 2006) did not report SF-36 means for the entire sample; they only reported mean change. This analysis made use of the mean change scores reported. There appeared to be a general decline in health status in all of the subscales over time. However, when conceived as independent cross-sections, both baseline and follow-up SF-36 scores were similar to the mean SF-36 normative scores, despite the intertest interval differences. A closer examination of the SF-36 mean change scores revealed less variation between the normative SF-36 scores and the scores at follow up compared to the baseline score. Change across subscales varied from to 1.8 to – 5.9. Larger negative changes were recorded for physical functioning, role physical, and social functioning. The Whitehall study (Hemmingway et al., 1997) reported the largest amount of change for almost all the subscales.

Table 2

SF-36 Scores (Mean) Presented by Sub-Scale and Normative Scores for the United States (1)

Study	PF			RP			BP			GH		
	Baseline survey	Last survey	Change	Baseline survey	Last survey	Change	Baseline survey	Last survey	Change	Baseline survey	Last survey	Change
Mishra et al ., 2004	85.9	83.9	-2	80.7	77.5	-3.2	71.2	71.2	0	72.7	72.8	0.1
Perneger et al., 1997	91.5	90.6	-0.6	87	85.8	-1.2	78.8	77.6	-1.3	77	76.1	-0.8
Thumboo et al., 2005	85.5	85	-0.5	87	85	-2	81	76.6	-4.4	68.2	66.3	-1.9
Hemingway et al., 1997												
Men	91.9	89.7	-2.2	91.9	86	-5.9	87.6	83.8	-3.8	72.5	70.7	-1.8
Women	83.7	80.3	-3.4	84.4	77.1	-7.3	78.8	75.8	-3	71.8	70	-1.8
Hopman et al., 2004[*]												
Women	NI	NI	-1.8	NI	NI	-1.8	NI	NI	-1.5	NI	NI	-1.0
Men	NI	NI	-1.4	NI	NI	0.9	NI	NI	-0.4	NI	NI	1.8
Hopman et al., 2006[*]												
Women	NI	NI	-2.2	NI	NI	0.6	NI	NI	-1.1	NI	NI	-0.2
Men	NI	NI	-1.5	NI	NI	0.5	NI	NI	0.7	NI	NI	-1.0

Normative scores	PF			RP			BP			GH		
United States (general population)	84.2			80.9			75.2			71.9		
United States (Men)	87.2			86.6			76.9			73.5		
United States (Women)	81.5			77.8			73.6			70.6		

Note. NI: not included in original paper, [*]overall mean change across age groups, did not report means by gender only change scores

Table 3

SF-36 Scores (Mean) Presented by Sub-Scale and Normative Scores for the United States (2)

Study	VT)			SF			ER			MH		
	Baseline Survey	Last Survey	Change	Baseline Survey	Last Survey	Change	Baseline Survey	Last Survey	Change	Baseline Survey	Last Survey	Change
Mishra et al 2004	58.9	57.7	-1.2	82.6	82.1	-0.5	78.4	79.7	1.3	73.4	73.6	0.2
Perneger et al 1997	65.2	65.1	-0.0	84.1	83.7	-0.5	77	79.2	2.2	69.3	69.2	-0.0
Thumboo et al 2005	63	61.7	-1.3	84.2	81.4	-2.8	82.4	80.2	-2.2	72.1	70.6	-1.5
Hemingway et al 1997												
Men	63.8	61.5	-2.3	91.3	87.3	-4	89.7	86.1	-3.6	77	75.6	-1.4
Women	57.8	55.9	-1.9	82	81.4	-0.6	86	80.9	-5.1	73.6	72	-1.6
Hopman et al 2004*												
Women	NI	NI	-0.3	NI	NI	-0.1	NI	NI	-0.4	NI	NI	-0.1
Men	NI	NI	0.0	NI	NI	1.7	NI	NI	2.5	NI	NI	0.7
Hopman et al 2006*												
Women	NI	NI	0.5	NI	NI	2.0	NI	NI	3.0	NI	NI	1.7
Men	NI	NI	-1.1	NI	NI	2.0	NI	NI	3.0	NI	NI	1.2

Normative Scores	VT			SF			ER			MH		
United States (General Population)	60.9			83.3			81.3			74.7		
United States (Men)	63.6			85.2			83.2			76.6		
United States (Women)	58.4			81.5			79.5			73.3		

Note. NI: not included in original paper, * overall mean change across age groups, did not report means by gender only change scores

Is the SF-36 Equally Stable for Men and Women?

Data from the studies in this review facilitated a limited gender-specific analysis of the performance of the SF-36. As mentioned earlier, only three studies reported gender-specific data (Hemingway et al. 1997; Hopman et al., 2004, 2006). Only change scores were reported, and mean SF-36 scores were not included. Table 4 show mean subscale change scores separated by gender. For both men and women, the largest changes were physical functioning and physical role. Overall, the average change was larger (-1.2) in women than in men (-0.6).

How Does the SF-36 Perform in Different Age groups?

Only two articles recorded data by age (Hopman et al., 2004, 2006). These articles were based on the same study population, namely, middle-aged Canadians. The earlier study published in 2004 reported SF-36 scores for the following 5-year age intervals: 40-44, 45-49, 50-54, and 55-59. The later article published in 2006 reported scores as 10-year intervals: 25-34, 35-44, 45-54, and 55-64. Subscale changes in the SF-36 were compared for each age group in order to examine whether the SF-36 was reliable and stable in measuring age-specific HRQL. Table 5 shows the average change in SF-36 scores by age group aggregated by gender for each of these studies.

Table 4

Change in SF-36 Scores by Gender

Men									
	Physical functioning	Physical role	Bodily pain	General health	Vitality	Social functioning	Emotional role	Mental health	Mean
Hopman et al., 2006	-1.5	-0.1	1.8	-1.0	-1.1	1.8	3.4	1.2	0.6
Hopman et al., 2004	-1.4	0.9	-0.4	0.3	.03	1.7	2.5	0.7	0.6
Hemingway et al., 1997	-2.1	-5.5	-3.7	-2.0	-2.6	-4.1	-3.8	-1.5	-3.1
Mean	-1.6	-1.6	-0.7	-0.9	-1.2	-0.2	0.7	0.1	-0.6
Women									
	Physical functioning	Physical role	Bodily pain	General health	Vitality	Social functioning	Emotional role	Mental health	Mean
Hopman et al., 2006	-2.3	0.6	-1.1	-0.2	0.5	2.0	3.1	1.7	0.6
Hopman et al., 2004	-1.9	-1.8	-1.5	-0.9	-0.3	-0.1	-0.4	-0.1	-0.9
Hemingway et al., 1997	-3.0	-7.3	-2.5	-1.9	-1.7	-4.5	-4.5	-1.5	-3.4
Mean	-2.4	-2.8	-1.7	-1.0	-0.5	-0.9	-0.6	.03	-1.2

Table 5

Change in SF-36 Scores by Age group and Gender

Hopman et al 2006 (5 year interval)	Women								
	Physical functioning	Physical role	Bodily pain	General health	Vitality	Social functioning	Emotional role	Mental health	Mean
25-34	-0.6	2.8	0.8	1.3	2.0	2.9	5.0	2.5	2.1
35-44	-1.7	1.7	-1.9	-0.6	-0.4	2.9	2.8	0.9	0.5
45-54	-3.0	0.0	-1.4	-0.5	0.7	1.5	2.4	1.6	0.2
55-64	-3.7	-2.0	-2.0	-0.9	-0.3	0.9	2.1	1.6	-0.5
	Men								
	Physical Functioning	Physical role	Bodily pain	General health	Vitality	Social functioning	Emotional role	Mental health	Mean
25-34	-2.7	-1.0	2.4	-1.8	-3.7	1.3	0.7	0.4	-0.6
35-44	-0.3	2.3	0.6	-0.3	-0.7	1.3	8.0	0.3	1.4
45-54	-1.3	0.4	-1.0	-1.1	0.5	3.4	5.4	2.6	1.1
55-64	-1.6	0.1	0.6	-1.0	-0.5	1.1	-0.2	1.5	0
Hopman et al 2004 (3 year interval)	Men								
	Physical functioning	Physical role	Bodily pain	General health	Vitality	Social functioning	Emotional role	Mental health	Mean change
40-44	-1.5	-0.1	1.8	-1.0	-1.1	1.8	3.4	1.2	0.6
45-49	-1.4	0.9	-0.4	0.3	.03	1.7	2.5	0.7	0.5
50-54	-2.1	-5.5	-3.7	-2.0	-2.6	-4.1	-3.8	-1.5	-3.2
55-59	-1.6	-1.6	-0.7	-0.9	-1.2	-0.2	0.7	0.1	-0.7
	Women								
	Physical functioning	Physical role	Bodily pain	General health	Vitality	Social functioning	Emotional role	Mental health	Mean
40-44	-2.10	-1.53	-3.46	-2.31	-2.32	-1.55	-4.01	-3.28	-3
45-49	-0.92	-0.93	0.04	-0.76	1.33	1.44	2.44	2.06	0.6
50-54	-2.46	-2.83	-1.85	-0.98	-0.09	-0.69	-1.84	0.09	-1.3
55-59	-1.93	-1.97	-0.73	0.37	-0.14	0.26	1.91	0.79	-0.2

A large change in midlife years (35-54 years) was recorded for mental health. The largest change in physical health also was recorded in the midlife years (35-54 years age group), but this change was minimal. Change in HRQL for both mental health and physical health was the largest in midlife, although in opposite directions as defined by these studies.

Discussion and Implications of Findings

This systematic review was aimed at examining the stability and reliability of the SF-36 based on data from longitudinal studies in healthy populations. This review examined the performance of the SF-36 for different study populations and age groups, as well as for gender. The review provided some evidence that the SF-36 is a relatively stable metric when used as a repeated measure in the same healthy population over moderate time periods. However, it did not establish whether the secular decline in SF-36 scores represented significant change. There has been debate about the amount of change that is considered socially and clinically relevant (Abbott et al., 2006). Some researchers have argued for a minimum of five points (Ware, Snow, Kosinski, & Gandek, 1993), and some ten points (Walters & Brazier, 2003; Panopalis et al., 2005). Results from this study's analyses of the selected studies show that based on these criteria, change recorded by the selected studies was not socially or clinically significant.

More important, perhaps, is the disproportionate between-test changes for each age group. It suggests that apparent stability is chimerical. If the degree of change between tests varies so largely by broad age group, it is at least plausible that the between-test interval, if sufficiently long, may include two or more age groups that are noncongruent in their variability. There also are questions about the factors that influence observed changes between tests, however modest. Factors such as study population, time interval between surveys, and sample size may influence change scores.

Unfortunately, the published literature has not been sufficiently detailed to explore these issues. The individual SF-36 scores in each of the studies included in this review were not presented in the published manuscripts. Therefore, it is practically impossible to measure within-person differences over time. These potential changes are masked when the SF-36 is examined cross sectionally and at the group or population level. In an attempt to provide a better understanding of the reliability of the SF-36, within-person differences need to be further studied. Studying within-person differences in SF-36 scores also will provide better knowledge on how the SF-36 performs in different populations and age groups.

This study also examined the gender-specific performance of the SF-36. The SF-36 appears to be gender sensitive. Results from analyses showed that the women reported more negative change than the men did. This gender-specific difference in self-rated health has been identified by other researchers (Li, Lam, & Ho, 2006). Some of the results from the current correspond to trends for working age adults in Britain (see Jenkinson et al., 1993). These researchers found that except for general health perceptions, women reported poorer health than men. The normative scores from the United States for each gender also showed lower scores for women than men. Although this analysis is relatively simple, it provides information about the performance of the SF-36 in both men and women, and suggests the consistency and stability of the SF-36 in measuring health status for both genders.

This review was limited by several shortcomings, such as number of studies and the fact that data at the individual level were not available. The paucity of the data made an in-depth comparison of the studies difficult. These limitations affected the methods used for analysis and the ability to explore the research question in-depth. Although the normative scores referenced in this study were population-based scores from the United States, none of the studies included in

this analysis was conducted in the United States. Hence, research on the performance of the SF-36 in healthy populations in the United States seems desirable.

The SF-36 is widely relied upon to capture important health-related outcomes in populations. Without an in-depth understanding of the performance of this measurement instrument in healthy populations, both policy and intervention decisions based on SF-36 studies may not be properly informed. The findings and issues raised in this study provide a better understanding of the use of the SF-36 in healthy populations. The findings, albeit simplistic, add to the literature and the knowledge base on the stability of the SF-36 in general. Specifically, the major claim made in the findings is that the SF-36 is a relatively stable metric when used as a repeated measure in the same healthy population over moderate time periods. It is hoped that this study will serve as a good starting point and a springboard for further research on the stability and reliability of the SF-36 measure.

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    doi:10.1177/14034948980260040401

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Abstract: Many worksite health promotion programs fail to engage lower-status workers, who are often at higher risk of many chronic diseases. We examined workplace risk factors for obesity, cigarette smoking, and physical inactivity through a questionnaire survey of 1506 nursing home employees who were mostly female and middle-aged on average. The prevalence of health behavior risks increased linearly with the number of work organizational stressors such as low decision latitude, low co-worker support, lifting heavy loads, regular night work, and recent physical assault by a resident. Each prevalence ratio (PR) was at least doubled for respondents with 4 or 5 of these job stressors; for obesity and smoking the excess risk was seen primarily among those under 40 years old. Workplace health promotion programs should implement primary prevention measures to reduce the sources of job stress and ensure that working conditions are not an obstacle to healthy behaviors of employees.

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DEPARTMENT OF WORK ENVIRONMENT

February 23, 2010

Marc Zimmerman, Ph.D.
Editor
Health Education and Behavior

Dear Dr. Zimmerman:

Enclosed please find an electronic copy of the manuscript, " Health Behaviors in the Nursing Home Workforce: The Contribution of the Work Environment," to be considered for publication as an original article in Health Education and Behavior.

This manuscript has not been previously published, does not essentially duplicate already published material, and is not being simultaneously considered for publication elsewhere. If it is accepted for publication, we will grant the journal exclusive license for publication. No author has a conflict of interest with the material described in this paper.

Thank you very much for your review of this manuscript.

Sincerely yours,

Laura Punnett, Sc.D.
Professor of Occupational Epidemiology and Ergonomics

Health Behaviors in the Nursing Home Workforce:

The Contribution of the Work Environment

INTRODUCTION

Obesity, cigarette smoking, and physical inactivity represent important and preventable health risks. They are typically framed as the result of individual "lifestyle" choices and often targeted through health promotion programs that seek to motivate individual behavior change. However, there has been increasing attention recently to evidence of socioeconomic disparities in such behaviors (Braveman, 2009) and to the role of higher-level environmental characteristics, both physical and psychosocial (Ball et al., 2006; Duncan et al., 2005; Koelen & Lindstrom, 2005). "Environment" is a broad construct representing the community, home, school, and/or the workplace. Of these varied settings, the work environment is perhaps the least well understood by health promotion (HP) practitioners. Although the workplace is a common venue for HP programs, the study of workplace features and their influence on health is generally considered the exclusive responsibility of occupational health specialists. This separation between the disciplines is unnecessary and even counterproductive (DeJoy & Southern, 1993; Grzywacz & Fuqua, 2000; Noblet & Lamontagne, 2006; Yassi, 2005). It is also increasingly hard to justify as the contribution of working conditions to health behaviors becomes more recognized.

For example, obesity has been related to several features of the work environment, especially night shift work and psychosocial job strain (the combination of high demands with low decision-making latitude at work), although the specific effects may differ between men and

woman (Brunner et al., 2007; Kivimaki et al., 2001; Ostry et al., 2006). Smoking habits have also been examined in relation to job strain and to social support from co-workers and supervisors. Sedentary behavior in men has similarly been associated with low decision latitude, high job strain, and passive (low demand/low control) jobs (Brisson et al., 2000; Wemme & Rosvall, 2005). Men were also less likely to be physically active if they worked overtime frequently and not by choice (Wemme & Rosvall, 2005). The number of cigarettes smoked per day is positively correlated to high job demands and negatively to resources at work (including job control) and social support, while the probability of smoking cessation and of relapse back to smoking are also related to these three factors, mostly in the expected directions (Albertsen et al., 2006).

Psychosocial strain, especially limited opportunity to participate in decision-making about the work process, is particularly a feature of low-status jobs, which are low in the organizational hierarchy. Thus it follows that the association of unhealthy "lifestyle" with low socioeconomic status may in part be influenced by stressful working conditions. Of course, those holding low-wage jobs are also more likely to have less education (including health literacy), unsafe housing and other environmental hazards. These combined risks imply that low-wage workers may experience additive or even synergistic effects of multiple risk factors, which in turn are associated with a wide range of health outcomes, from cardiovascular disease to back pain, whose causes cannot be traced conclusively to any single discrete exposure.

We are investigating whether there are measurable differences in employee health when an ergonomics program is combined with employer-sponsored wellness activities or a participatory worksite health promotion (WHP) program in a large chain of long-term care facilities (nursing

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homes) (Punnett et al., 2009). As background to that larger effort, the aim of this cross-sectional study was to investigate whether individual health risk behaviors (smoking, physical inactivity, obesity) were associated with physical or psychosocial conditions of work that could be addressed by the WHP program. In light of other findings suggesting that age might modify the associations between occupational conditions and health (Brisson et al., 1999; Kivimaki et al., 2001; Miranda et al., 2008; Parkes, 2002), we also examined whether these relationships differed between younger and older members of the study population.

METHODS

Study Population and Procedures

Questionnaire surveys were conducted of all permanent full and part time clinical employees in 18 nursing homes on up to three occasions between 2006 and 2008. The nursing homes were within a single company and located in Maryland and New England (Maine, Massachusetts, and Rhode Island). Survey timing was planned in reference to the implementation of a Safe Resident Handling ("No Lift") program with installation of resident handling equipment. In 12 centers, baseline surveys (F0) were administered during the week of initial program training for department heads (defined as the implementation date). Surveys were also distributed at three months (F1), one year (F2), and two years (F3) post implementation. The other 6 centers had already had resident handling devices installed prior to the corporate-wide program, so their entry surveys were conducted at least one year post-baseline using the F2 follow-up instrument. The first survey in each center was selected for these analyses.

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Nursing aides (NA), licensed practical nurses (LPN), and registered nurses (RN) as well as other clinical care personnel, such as physical and occupational therapists, were eligible to participate. Temporary agency staff members were not eligible to participate. Office, laundry, food service, and janitorial staff were recruited only for F2 surveys in 4 New England centers, where participatory programs were concurrently under consideration for the entire workforce.

Questionnaires were distributed and collected at the nursing homes by the members of the study team. Most workers completed them during scheduled break times. For those who could not be met in person, such as third-shift and weekend employees, a pre-stamped, addressed return envelope was provided. Compensation of $20 was offered in exchange for each completed questionnaire returned with an informed consent form. The study proposal was approved by the Institutional Review Board of the University of Massachusetts Lowell.

The self-administered questionnaire collected detailed information on demographic characteristics (e.g., age, gender, length of education, ethnic origin), working conditions, current and recent health endpoints, health locus of control and self-efficacy, and health behaviors. To the extent possible, questions were derived from pre-existing, validated items and scales.

Health Behaviors

Physical exercise was measured using a single question: 'How many times a week on average do you work up a sweat (at least 20 min per session, for example fast walking, jogging, bicycling, swimming, rowing, etc.)?' The response categories were none; some but less than once a week; 1-3 times per week; more than 3 times per week. Physical inactivity (yes/no) was defined as a response of 'none' versus all other responses. The question on smoking was categorized as

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current, former, or never; 'current smokers' were compared to former and never-smokers. Body Mass Index (BMI) was computed from self-reported weight and height; 'obese' was defined as a BMI of 30.0 or above.

Work Environment Characteristics

The questionnaire addressed psychological demands of work, job control, co-worker support, supervisor support (2 items each, from the Job Content Questionnaire (JCQ) (Karasek et al., 1998)); adequate staffing (1 item: 'My work area is adequately staffed'); schedule control (2 items (Büssing, 1996)), and regular night shift work (1 question). Workplace safety and climate issues included safety climate (4 items, 2 from Griffin (Griffin & Neal, 2000) and 2 developed by the investigators); being assaulted at work by a resident, resident's visitor or family member in the past 3 months; and tolerance of discrimination in the workforce (1 item: 'This organization practices zero tolerance for discrimination').

Physical requirements at work were characterized in terms of: moving or lifting heavy loads (1 item, JCQ); rapid and continuous physical activity (1 item, JCQ); and awkward postures (3 items, JCQ). The sum of these 3 exposures was labeled 'physically demanding work.' Work-family interference (3 items (Gutek et al., 1991)), and employer support for family or other personal responsibilities (1 item) were assessed. Respondents were also asked whether they had another paid job outside the workplace where they were surveyed.

All items were assessed with a 4-point Likert scale (strongly disagree; disagree; agree; strongly agree) and were dichotomized between 'disagree' and 'agree.' For those scales including more than 1 item, the items were summed (after reversing where appropriate) and the sum index was

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dichotomized using a cut-off that created categories that corresponded as closely as possible to the average of the original distributions of the individual items (i.e., if 22% of the workers replied 'agree' or 'strongly agree' to the first item, and 18% to the second item, their sum index was dichotomized so that 20% agreed).

Statistical Analysis

The three dependent variables were the health behaviors (HB's) of smoking, physical inactivity, and obesity. The work environment factors were the key independent variables of interest. Prevalences of both the HB's and the workplace risk factors were examined by job title, geographical region, and age group (under 40 vs. $\geq$40 years).

Associations between HB's and the work factors were assessed by cross-tabulation and then with log-binomial regression. If the log-binomial model failed to converge then the COPY method was used (Deddens & Petersen, 2008). The risk estimates are presented as prevalence ratios (PR) with 95% confidence intervals (CI). To limit the number of independent variables in the models (for statistical power and collinearity), the five exposures with the highest associations with each HB were chosen to construct an index with 5 levels (exposed to 0, 1, 2, 3, or 4-5 of the factors) for subsequent modeling. Most associations with this exposure index were found to vary by age and therefore analyses were age-stratified. All models included gender, geographical region (Maryland vs. New England), education, and age (if not stratified). There was some variation in HBs by race/ ethnicity but no confounding effect on the associations with the exposure indices, so ethnicity was not included in the models.

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The proportion of missing values in each variable in the analyses was at most 4%. All statistical analyses were carried out with the statistical software package SAS (version 9.1, SAS Institute Inc, Cary, NC, USA).

RESULTS

Response, Demographics, and Work Environment Characteristics

Questionnaires were received from a total of 1,506 persons, of whom over 50% were nursing aides. The response rate was 72% (F0) to 73% (F2) of all eligible clinical staff listed on the workforce rosters (unweighted averages of all centers). For the F2 survey we were able to enumerate the eligible employees who were actually at work during the days the study team was on site, and participation was about 90% of those individuals.

Survey respondents were mostly female (89%). Almost half (47%) were white, non-Latino, but there was a large difference by region, with 67% African-American or African in Maryland and a majority white in New England. Their average age was 41 years (standard deviation, SD, 13); the aides were about 5 years younger on average than other employees. The average number of years worked in the same type of job was 11 years (SD 10), although one in four workers reported more than 17 years of seniority. The age, gender, and race distributions were all quite consistent with the workforce demographics for these workplaces. In the 4 centers where non-clinical workers were recruited they were slightly under-represented (34% of all employees but only 20% of respondents). Seniority in the current job (from workforce rosters) was 6 to 8 years less than lifetime experience in the same type of work (from questionnaires).

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Of all respondents, 34% were obese, 23% reported performing no physical exercise at all outside of work, and 24% smoked currently. One in five of these low-wage workers reported having at least one other paid job outside of the workplace where they were surveyed.

In these nursing home jobs, employees reported very high exposures to high psychological demands at work (88% of respondents), awkward postures (65%), poor safety climate (60%), lifting heavy loads (57%) and imbalance in work-family life (43%). Surprisingly, there were few large differences by job title (Table 1), although nursing aides reported more physically heavy and psychologically demanding work, more recent assaults at work, and lower employer support for family responsibilities.

— Table 1 about here —

There were few marked differences in demographic or workforce characteristics between participants in Maryland, Maine, and southern New England. However, those in Maryland were more often obese, less likely to be current smokers, and less physically active during leisure time. Workers in southern New England reported slightly lower levels of physical work demands than other respondents.

Workers younger than 40 years consistently reported more workplace risk factors than those aged 40 and older (Table 2). Physical workload and safety problems, in particular, were more prevalent among the younger workers. No major differences were seen in smoking or inactivity between the age groups, but older individuals were more likely to be obese.

— Table 2 about here —

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Work Environment and Health Behaviors

Associations between the health behaviors and individual work factors were generally modest when examined separately, although there were many trends in the expected directions. In age-stratified cross-tabulations, the associations were somewhat stronger among the younger participants for many variables, the largest differences being for the relationships of physical demands with smoking and night work with obesity. In contrast, the association between violence and physical inactivity was statistically significant among older but not younger individuals.

The risk of being obese was linearly associated in multivariable modeling with the sum of these occupational risk factors: low decision latitude, low co-worker support, lifting heavy loads, night work and recent physical assault by resident or resident's visitor. The prevalence ratio was 1.7 for workers exposed to all five of these, compared to no exposure; among nursing aides alone the PR was 2.1. Age strongly modified the risks; among younger workers the prevalence ratio was 2.3 for 2 or 3 exposures and 2.8 for 4-5 exposures, compared to no exposure (Figure 1). Among the older workers, the PR's varied between 0.9 and 1.4, all confidence intervals including unity.

-- Figure 1 about here --

Similarly, current smoking was almost twice as high among workers exposed to at least 3 of a similar set of 5 job stressors (low decision latitude, low supervisor support, having another paid job, physically demanding work, and recent physical assault). Again, the effect was slightly steeper for aides alone and much stronger among younger workers, whose probability of smoking increased up to 2.6 for those exposed to 4-5 factors (Figure 2).

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Physical inactivity also showed a linear increase with work risk factors, although not as marked as for the other two HB's. The exposures associated with inactivity were low decision latitude, low co-worker support, employer tolerance of discrimination in the workplace, work-family imbalance, and night work. The prevalence ratio was 2.0 for workers exposed to 4 or 5 of these, compared to no exposure; the linear trend was very similar for aides alone and for both age groups (Figure 3).

DISCUSSION

This questionnaire survey sought to identify correlates of health behaviors in a large group of predominantly female working adults, at least half of whom were low-income and who had a number of important health risk behaviors and conditions (Punnett et al., 2009). They were surveyed at their workplaces with several long-term goals in mind, including needs assessment for and evaluation of feasibility of a participatory health promotion program in these centers. Thus these data served to identify a range of stressors that might need to be addressed for any future such program to be successful.

Our survey confirmed prior reports that the long-term care sector is a physically and psychologically demanding work environment. Certified nursing assistants and other aides, who make up more than one-half of this workforce, are predominantly women of low education and socioeconomic status who experience high physical workloads, high injury rates, high psychosocial strain, and psychological and somatic distress (Hsu et al., 2007; Lapane & Hughes,

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2007; Morgan et al., 2005; Myers et al., 2005; Myers et al., 2006). Unwanted shift work and overtime represent only one visible manifestation of low control at work (Büssing, 1996).

These results illustrate clearly that the work environment is not only a convenient venue for reaching large numbers of adults with health information and opportunities but also an entire environment with its own health stressors and potential obstacles to participation in health programming. In this particular setting, stressors such as night shift work, physical assault, and psychosocial job strain – which are already known to be predictors of physical and mental health outcomes – were associated with several important health behaviors or characteristics.

Plausibility of the Findings

Others have reported associations between stressful features of the work environment and specific health behaviors such as obesity, smoking, and lack of voluntary exercise. Results are sometimes inconsistent; different patterns by gender, racial/ethnic group, or other demographic characteristics may be part of the explanation. For example, in a large Finnish sample of public sector employees, high job strain was more strongly associated with smoking among women but with inactivity among men (Kouvonen et al., 2005a; Kouvonen et al., 2005b).

Also consistent with our findings are studies on the effects of psychosocial job stressors on combined health behaviors. The same Finnish investigators (Kouvonen et al., 2006) reported a linear trend in unhealthy behaviors (smoking, heavy drinking, obesity, and inactivity) with the combination of high job effort (similar to high demands) and insufficient reward. Low social capital at work, a construct that overlaps with both social support and participation in decision-making, was associated with higher odds of having more than two lifestyle risk factors: current smoking, being overweight, physical inactivity, and heavy drinking (Väänänen et al., 2009).

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Perceptions of unfairness at work – whether framed as low supervisor support, tolerance of discrimination, or organizational injustice – are also sources of stress that may have behavioral, emotional, physiological and clinical consequences (Braveman, 2009; Fujishiro & Heaney, 2009).

One highly plausible mechanism for these associations is the effect of stressful working conditions on mental health. Work stressors such as those studied here, especially low decision latitude coupled with high job demands, have been shown repeatedly to increase the risk of depression (Bonde, 2008; LaMontagne et al., 2008; Stansfeld & Candy, 2006). In turn, depressive individuals are less likely to exercise (Craft et al., 2008), have lower self-efficacy to stop smoking (Haukkala et al., 2000) and lower smoking cessation rates (Berlin & Covey, 2006).

Another possible mechanism is more instrumental in nature. For example, Payne and colleagues (Payne et al., 2002) found that people in high job strain exercised less; while job strain did not reduce the intention to exercise, high job demands appeared to interfere with that intention. Furthermore, lack of job flexibility and work barriers (hours, stress, and traveling) contributed to low exercise self-efficacy. In a separate study, the same investigators reported that job demands lowered perceived control over exercise and also that job characteristics were associated with consumption of sweet and other high-density snack foods (Payne et al., 2005).

Night shift work was a component of the exposure index for both obesity and physical inactivity. This finding is highly compatible with prior work showing that night work is directly associated with obesity (Niedhammer et al., 1996; Parkes, 2002) as well as with lower intake of dietary fiber (Knutsson, 1989), adverse serum lipid and cholesterol profiles (Lennernas et al., 1994), and oxidative stress (Sharifian et al., 2005). The simple struggle to obtain sleep of sufficient quality and quantity may be enough to explain the shift worker's difficulty in also

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finding suitable and sufficient time for physical exercise, especially considering that many of these study participants also have children at home and/or second jobs. The contribution of work-family imbalance to the risk of physical inactivity is also consistent with this hypothesis.

In regard to effect modification by age, we have found several reports of a trend in the opposite direction from ours. Among Finnish nurses, those who consistently worked nights or rotating shifts both smoked more and were more often overweight than day workers. However, both of these effects interacted positively with age, so that nurses over 45 years of age had the largest attributable increases (Kivimaki et al., 2001). Similarly, among men working on offshore oil/gas installations, age was a predictor of BMI among day workers, but among shift workers there was a stronger effect of years of shift work which produced a higher BMI by the age of 40 among shift workers compared to day workers (Parkes, 2002).

Nevertheless, in this large population of working women there is a consistent pattern that job stressors have a large effect on younger individuals. This might result from a "healthy worker" selection effect, if there is higher turnover among older workers in situations perceived to be more stressful. Alternatively, older workers might be showing the cumulative effect of longer exposure to both occupational and non-occupational risk factors.

Study Strengths and Limitations

This study has several potential limitations. Most important is its cross-sectional nature, which means that the temporal direction of the associations cannot be confirmed. Second is that our findings are based on self-reported data; it is likely that some individuals may have under-estimated their body weight or smoking or overstated their exercise levels. Reassuringly, Huerta et al. reported that self-reported smoking has moderately good reliability (Huerta et al., 2005). BMI computed from self-reported data is underestimated by about one unit, with slightly larger

effects in persons 60 years of age and little variation by ethnicity (Ahluwalia et al., 2009; Kuczmarski et al., 2001; Pan et al., 2009). Such an effect here would most likely have resulted in negligible information bias or in bias toward the null in the reported associations.

Our study also has several important strengths, including that the limited range of job titles surveyed helped to reduce the likelihood of unmeasured confounding by other features of socioeconomic status. In addition, the high proportion of respondents who were nursing aides provided sufficient statistical power to confirm that these associations were observed even in that SES group alone.

The high response rate to this survey helped to guard against selection bias and produced a sample with demographic characteristics representative of the entire company workforce. The workplaces surveyed were a convenience sample from a corporation that employs over 200,000 people, so generalizability to other employed adults is another valuable study feature. At the same time, the exact response rate was difficult to determine because none of these centers could provide a definitive number of employees. Total counts from centers' payroll rosters were neither consistent multiples of the daily staffing rosters nor equal to the corporate personnel figures for the time periods sampled. The variability in employee counts from facility rosters was likely related to the combination of high clinical staff turnover and the competing demands of administrative employees. The staffing coordinator in each facility is charged with producing and distributing daily staffing schedules, maintaining the facility rosters, and participating in payroll activities, among other tasks. Further, the turnover among nurse managers and administrators is high. These vacancies result in a default transfer of the higher responsibilities of keeping all units and shifts staffed to the staffing coordinator. Since employees must be paid on time, and daily staffing requirements are both mandatory and necessary for safe operation, the

continuous updating of employee names in a central database is likely a lower priority. Thus, despite expending considerable effort to determine the number of eligible workers during the days that we were on site, our response rates are approximate (but conservative).

Generalizability is also suggested by the fact that this sample of U.S. nursing home employees had health behavior risks comparable to the national female workforce. The prevalence of smoking among survey respondents (23%) was slightly higher than the estimate for U.S. female adults (17%) (Pleis & Lucas, 2009). One-third of this population was classified as obese, which was somewhat higher than all US women (26%). More than half of respondents reported exercising (to work up a sweat) never or only sometimes, whereas 67% of US adult women are inactive.

Conclusions

Workplace health promotion programs, which typically address health behaviors such as smoking, exercise, and energy balance, often have limited participation (Robroek et al., 2009). A particular concern is the failure to engage lower-status workers, who tend to be at higher risk. These individuals are typically employed in jobs that are less flexible and offer fewer opportunities for learning and empowerment (Koelen & Lindstrom, 2005), implying that workplace stressors and obstacles may be particularly important in their lives.

The findings presented here suggest that WHP programs might benefit from recognizing and addressing the contribution of the work environment, whether direct or indirect, to the health and health behaviors of individual employees. Addressing the stressful aspects of working conditions ought to impact employee health directly as well as improve WHP program participation and effectiveness.

Implications for Prevention

Understanding and addressing the barriers to health-promoting behaviors - and program participation - is essential for designing an effective, comprehensive employee health program. In the present study, work experiences such as heavy lifting, assaults, night shifts, low social support and low decision latitude were all linked negatively to adverse health behaviors. Many of these stressors are preventable through training, improved job design, and organizational changes. In other words, addressing the stressful aspects of working conditions ought to impact employee health directly as well as improve WHP program participation and effectiveness.

Just as maintaining healthy weight, smoking avoidance, regular exercise, and healthy diet can help prevent the physiologic changes that lead to chronic disease, designing healthy jobs and healthy work environments can prevent the physiologic changes (elevated blood pressure, cortisol, etc.) that are well-known to result from job strain. In addition, this paper adds to the more recent literature showing that job strain also leads to unhealthier behaviors, probably often because they have become coping mechanisms.

The evidence base for work organization stress interventions has grown substantially in recent years. Interventions typically fall into the following categories: reducing job demands (redesigning workstations to reduce musculoskeletal load, providing breaks, noise reduction); increasing job control (increasing employee participation in decision making, scheduling to balance work-family commitments, job redesign to add variety and control pacing); and improving social support (training on communications, conflict resolution, team building).

These are examples of primary prevention, in that their goal is to eliminate exposure to risk factors and not simply training individuals to behave more healthfully.

Reducing job demands can often be achieved through engineering controls or other design strategies to abate physical stressors. Lifting heavy loads and generally high physical demands are now being directly addressed by the Safe Resident Handling program in this company. The use of mechanical patient lifting devices often reduce biomechanical loading on the back to safer levels, although they do not necessarily eliminate all hazardous loading (Daynard et al., 2001; Elford et al., 2000; Nelson et al., 2006; Zhuang et al., 1999). Such a program may also decrease assaults on caregivers (Collins et al., 2004). Other measures to reduce violence include training, behavioural, and environmental interventions (Hall et al., 2009).

Psychosocial conditions are more challenging – but not impossible - to address. Increasing the schedule control of employees can reduce the stress associated with regular night work (Pryce et al., 2006). Decision latitude or co-worker support can be enhanced through improved communication and employee teams that identify problems and redesign organizational structure, process, and/or work space, along with management training on communication and supervision skills (Bourbonnais et al., 2006; A. LaMontagne, D. et al., 2007a; Maes et al., 1998; Noblet & Lamontagne, 2006; Poulsen et al., 2007). Kawakami et al. (Kawakami et al., 2005) implemented a supervisor training program that maintained supervisor support over 3 months, as perceived by their subordinates, compared to decreased support in the control group. Improved leadership and social climate in four Swedish companies led to improved health-related quality of life over a three-year period (Lohela et al., 2009).

There are several practical considerations related to addressing the stressful aspects of working conditions. First, organizational change and job redesign are not typically the domain of

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health promotion practitioners. The idea of incorporating working conditions into WHP planning and evaluation may seem unrealistic if practitioners feel unqualified to offer solutions that they can execute on their own. Therefore collaboration across disciplines and new working partnerships are necessary to build political support and will to address organization-wide problems. WHP practitioners could benefit from understanding that workplace exposures are not necessarily inherent in the job, and occupational health specialists would benefit from understanding the wider range of health consequences that follow.

Related to this, gaining top management commitment would be essential for committing the resources and time for the necessary expertise, employee engagement and problem solving processes, evaluation, and follow up. One small step that could be taken would be to start by gaining management support for engaging Employee Assistance personnel to participate on the WHP leadership committee (assuming that there is one), so that the causes of work-related mental health concerns are addressed in the assessment and program planning process.

On a larger scale, elevating the health focus to the level of the business goals is another way to assure that the work environment is addressed within the context of WHP programs. An organizational "culture of health" should seek to engage company managers and supervisors to commit to their own personal health, to design policies to support a healthy work environment, and to support the personal health goals for employees. A review of job stress intervention evaluations showed that by improving the psychosocial work environment, companies can realize both health benefits for employees and bottom-line benefits of reduced absenteeism and turnover, with a relatively prompt return on investment (LaMontagne et al., 2007b).

ACKNOWLEDGMENTS

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Figure 1. The risk of being obese by the number of occupational hazards and by age-group.
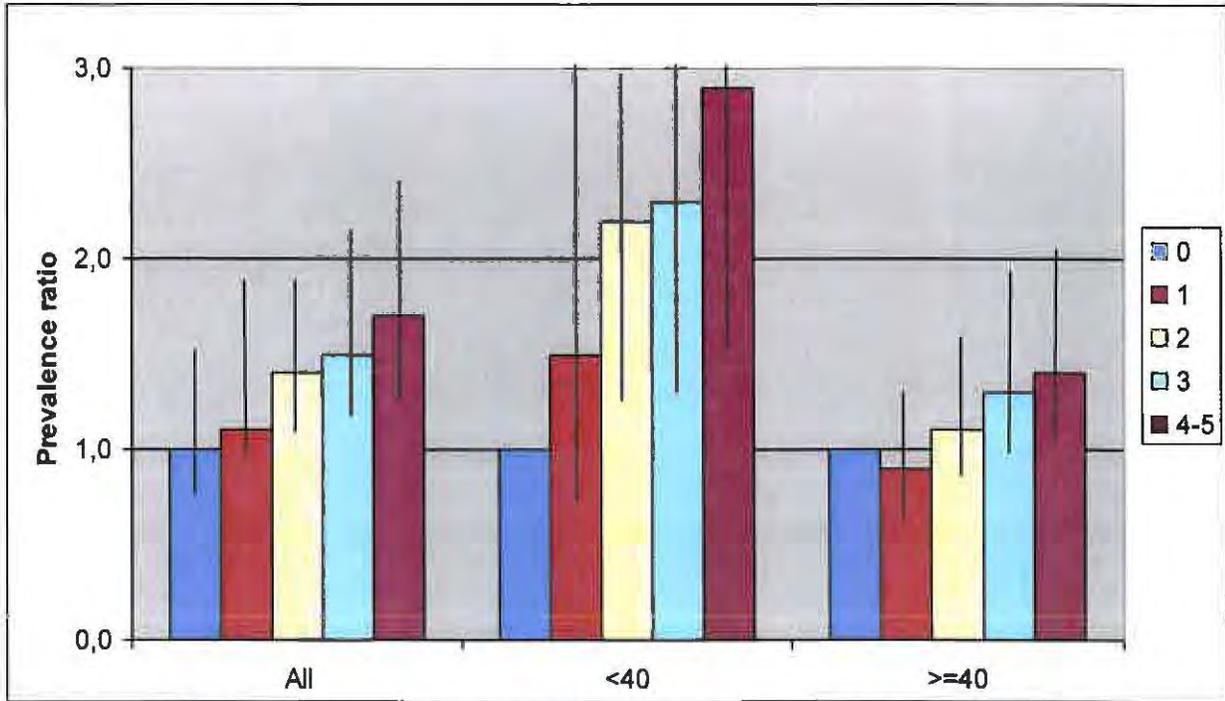
Hazards: poor co-worker support, low decision latitude, exposure to violent attacks at workplace, exposure to night work, lifting heavy loads

Figure 2. The risk of being a current smoker by the number of occupational hazards and by age-group
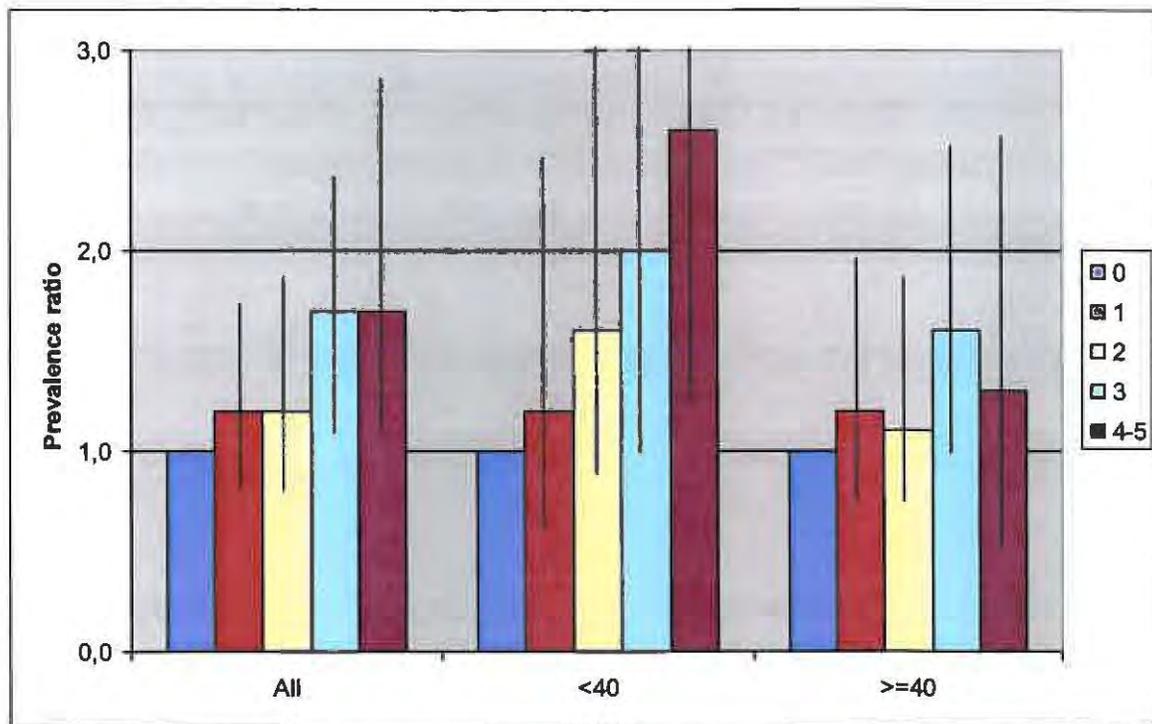
Hazards: low decision latitude, low supervisor support, exposure to violent attacks at workplace, having another paid job, physically demanding work

Figure 3. The risk of being physically inactive by the number of occupational hazards and by age-group
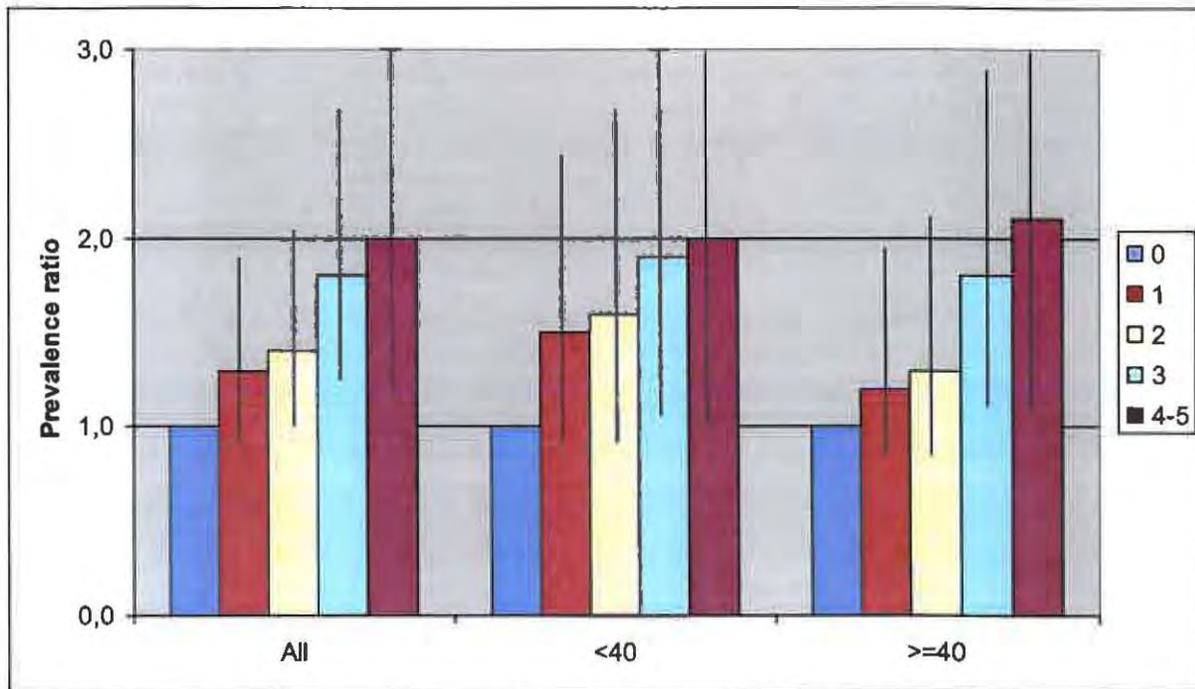
Hazards: poor co-worker support, low decision latitude, employer tolerates discrimination at workplace, work-family imbalance, exposure to night work

All models adjusted for gender, education and region and age (if not stratified).

Table 1. Working condition and individual risk factors by job title: 1,506 U.S. nursing home employees.

	Nursing aides (n=836)†	Other jobs* (n=661)†
Physical requirements at work:		
Heavy lifting (%)	63	47
Rapid and continuous physical activity (%)	85	64
Awkward working postures (%)	75	55
Physically demanding work (%)	60	38
Work organizational factors:		
Low decision latitude (%)	27	25
High psychological demands (%)	91	88
Job strain (high demand - low control) (%)	25	21
Low schedule control (%)	21	20
Regular night shift (%)	25	20
Social support at workplace:		
Low coworker support (%)	36	28
Low supervisor support (%)	25	17
Safety and tolerance issues:		
Exposed to one or more violent assaults at work in the past 3 months (%)	51	32
Poor safety climate (%)	64	53
Employer tolerates discrimination (%)	21	16
Other:		
Imbalanced work-family life (%)	46	43
Low employer support for family or other personal responsibilities (%)	51	36
Having another paid job (%)	21	20
Health Behaviors:		
Current smoker (%)	27	21
Obese (BMI>30) (%)	36	32
Physically inactive (%)	24	22
Age (mean)	38.8	44.0
Gender: Female (%)	91	87

* Licensed practical nurses (LPNs), registered nurses (RNs), physical and occupational therapists, office, laundry, food service, and janitorial staff.

† Numbers of respondents varied slightly among variables due to missing values.

Table 2. Working conditions and individual factors by age group: 1,506 U.S. nursing home employees.

	Younger than 40 years (n=690)†	40 years and older (n=737)†
Physical requirements at work:		
Heavy lifting (%)	61	51
Rapid and continuous physical activity (%)	82	70
Awkward working postures (%)	74	59
Physically demanding work (%)	59	43
Work organizational factors:		
Low decision latitude (%)	26	26
High psychological demands (%)	92	87
Job strain (high demand - low control) (%)	23	23
Low schedule control (%)	23	17
Working at night (%)	22	23
Social support at workplace:		
Low coworker support (%)	34	31
Low supervisor support (%)	22	20
Safety and tolerance issues:		
Exposed to one or more violent assaults at work in the past 3 months (%)	48	38
Poor safety environment (%)	63	54
Employer tolerates discrimination (%)	19	18
Other:		
Imbalanced work-family life (%)	49	41
Low employer support for family or other personal responsibilities (%)	45	43
Having another paid job (%)	22	19
Health Behaviors:		
Current smoker (%)	24	26
Obese (BMI>30) (%)	30	38
Physically inactive (%)	23	23

† Number of respondents varied slightly among variables due to missing values.

Work organization and health issues in long-term care centers: Comparison of perceptions between caregivers and management

INTRODUCTION

The nursing home sector is reported to be the second most hazardous in the United States in terms of recognized work-related injuries and illnesses (Bureau of Labor Statistics, 2002). Nursing assistants, who are predominately women of low education and socioeconomic status, account for 85% of nursing staff (Wunderlich, Sloan, & Davis, 1996) and provide up to 90% of front-line care in nursing homes. They engage in work that is physically and psychologically demanding and juggle multiple work and family responsibilities. According to the National Nursing Assistant Survey of 3017 Certified Nursing Assistants (CNAs) working in nursing homes in 2004-2005, more than half of CNAs incurred at least 1 work-related injury within the past year and almost one quarter were unable to work for at least 1 day due to the injury (Squillace et al., 2009).

Back pain and injury are very common among nursing assistants and have been repeatedly linked to lifting, transferring and repositioning of residents (Garg & Owen, 1992; Garg, Owen, & Carlson, 1992; Owen & Garg, 1991). Psychological stress, in the form of high demand and low control over work conditions, is also prevalent among this population. Recognized risk factors for stress include heavy workload and short staffing (Lapane & Hughes, 2007), caring for demented and cognitively impaired residents (Brodaty, Draper, & Low, 2003; Chappell, 1994; Morgan, Semchuk, Stewart, & D'Arcy, 2002), and work organization features such as undervalued by management and shortage of essential resources (Dunn, Rout, Carson, & Ritter, 1994).

There is general agreement that safety culture in the work environment emerges from shared beliefs, attitudes and values of the organization's personnel (Davies, Nutley, & Mannion, 2000). Previous studies have shown that managers' attitudes, behaviors and supports have great impacts on staff job strain, turnover, job satisfaction, and the safety climate in the environment (Anderson, Corazzini, & McDaniel, 2004; Huang, Ho, Smith, & Chen, 2006; Sundin, Hochwalder, Bildt, & Lisspers, 2009). Therefore, whether there are shared beliefs and attitudes between caregivers and managers means a lot to the long-term care workforce.

Beside, employee involvement and management commitment are both important for improvement of workplace health and safety. However, employees' perception of occupational safety and health risks may be different from that of the managers. A study in forty small local businesses reported that managers had a generally more positive perception of workplace safety culture than employees (Parker et al., 2007). Another study of intensive care units in a single facility reported that directors generally overestimated teamwork and work conditions relative to staff experience (Huang et al., 2007). The extant literature on health and safety hazards rely mostly on nursing assistants' perceptions (Sofie, Belza, & Young, 2003); few studies reported the health and safety concerns from managers' perspective or compared the perceptions of nursing assistants and managers in long-term care centers.

The purpose of this study was therefore (1) to compare the perceptions between nursing assistants and managers about their views on workplace health and safety, work organization, and psychosocial concerns; (2) to learn about worker-management interaction from both perspectives; and (3) to access the managers' potential support of worker participatory activities for improving employee health. The study was carried out as part of a selection process to

identify appropriate sites for an intervention involving both occupational health and health promotion.

METHODS

Study Design

We conducted open-ended individual interviews with nursing home administrators and directors of nursing and focus groups with nursing assistants at the same center. Both data collection activities sought qualitative information on their perceptions of the workplace health and safety, work organization, psychosocial concerns, and commitment to future health promotion activities. Information collected from nursing assistants and managers was coded from broad themes and compared. We used an exploratory qualitative design because qualitative research provides well-established methods for investigating complex and poorly understood organizational and human phenomena (Mergler, 1999).

Setting

All nursing homes participating in this study were part of a large chain of nursing homes that had implemented a "no-lift" or "safe resident handling" program in all of its New England facilities approximately two years prior to our investigation. The participating company operates 217 long-term care facilities in 12 states in the eastern United States. Some but not all facilities are unionized. Each facility has about 100-150 employees, of whom 50-80 are clinical staff members. Turnover varies widely among all facilities, from very low up to 50% per year. The company had agreed to allow the investigators to implement independently designed, participatory programs linking employee occupational health and health promotion in a few selected facilities. Based on a list of research criteria related to management style, work organization, and managers' anticipated openness to the new program, the company's northeast

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regional director for health and wellness suggested four possible intervention centers. These candidate centers did not have current health promotion programs in place. The study design also called for three "control centers" with employee wellness programs already underway. Three centers with a high level of activity relative to other centers in the same company were selected as the control candidates. Thus a total of seven nursing homes in Massachusetts, Rhode Island, and Maine were chosen for this pre-intervention study.

Sample and Data Collection

Management Interviews Individual interviews with center administrators and directors of nursing were scheduled for one hour each in their office. Management interviews were conducted to gain a better sense of managers' views on work environment and determine managers' interest and commitment regarding the participatory health promotion program.

Focus groups At each center, in order to ensure a dynamic discussion and broad representation, nursing assistants were recruited from different work shifts and units. Focus group met twice, for 90 minutes each, at two-week intervals. At most sites, two separate focus groups were recruited to allow representation from all shifts. Focus groups were limited to 10 participants in a private room to provide an atmosphere in which conversation could flow freely. Each focus group participant was compensated $20 for completing the first session and another $30 for completing the second session.

One experienced project manager and one research assistant conducted both the interviews and focus groups. Topics for management interviews and focus groups were introduced in Table 1. The similar key topics and questions were covered from health and safety concerns and no-lift program, worker participation, and health promotion programs. Purpose and procedure were explained first and participants were asked to sign the consent form. All interviews and focus

groups were tape-recorded. Focus group participants each chose an "alias" to protect their identity. The electronic versions of interview audio materials and transcripts were stored on password-protected computers. Recordings were transcribed professionally with both recordings and transcripts locked in a secure place. The study was approved by X Institutional Review Board (No. 06-1403).

Data Analysis

The interviewers reviewed the printed transcripts several times to sort the discussion topics into categories. A "start list" of codes was created by the interviewers including workplace health and safety, work organization, psychosocial concerns, and health promotion programs. The transcripts were then imported into NVivo7. Using the already created "start list" of codes, another two research assistants, who had received 4-hour intensive NVivo 7 training, coded the transcripts in the software to pull out direct quotes. The codes and quotes were then discussed by the research team. Discrepancies between team members were resolved through interpretive discussions, consensus building, consultation with the interviewers, and refinement of code definitions as needed. The resulting data were output from NVivo7 and a summary of codes and quotes for focus groups and management interviews was separately generated. The summary of focus group codes and issues in each center was then mailed to the same focus group participants for interpretation and validation.

RESULTS

Sample Description

Fourteen individual interviews with center administrators and directors of nursing were completed in June 2007. Four of seven administrators and five of seven directors of nursing were

female. All administrators and directors of nursing were white, non-Hispanic. The average length of tenure for administrators and directors of nursing was 4 years.

Twenty-seven focus groups were conducted at seven centers from July 2007 to March 2008. The average number of nursing assistants participating in each focus group was 6. A total of 81 nursing assistants participated in focus groups: 94% were female, 69% were white, 27% were black, 3% were Asian, 1% were American Indian, and 30% were Hispanic.

Findings

There were no important differences between topics or opinions from administrators and directors of nursing in the same facilities, so management interview data were combined to compare to the focus groups. The issues raised were grouped into four primary categories: Workplace health and safety, work organization, psychosocial concerns, and health promotion programs.

Workplace health and safety

The workplace health and safety category included reports in six subcategories: Ergonomic concerns, combative residents, infectious diseases, trip hazards, poor circulation, and needle sticks.

Resident handling was one of the biggest concerns in both focus groups and management interviews. Participants in focus groups repeatedly mentioned the physical risks associated with lifting and transferring residents and the resultant injuries to their backs and shoulders. Both nursing assistants and managers agreed that the corporate-wide no-lift program had improved conditions and reduced injuries. One nursing assistant said, "The lifts are pretty good, and so there is less stress on your back with lifting people." The managers agreed that there had been "a significant decrease in injuries of employees" after introduction of the no-lift program. Both

nursing assistants and managers believed that the staff had received sufficient training about how to use lifting equipment correctly.

Nursing assistants and managers agreed in part about the causes of injuries with resident handling. Managers expressed that workers were still getting injured because of lifting residents manually, which might be quicker than using lifts or coaxing "residents afraid of lifts." Nursing assistants similarly said that time strain and residents becoming combative during lifting were some reasons for non compliance with lifts. One nursing assistant said, "We are a no-lift facility...but we do lift, because sometimes you just don't have the time to do it, to go and get the machine." However, some managers also attributed the injuries to "people [weren't] following the plan of care," while in contrast "not have enough people to do the lifting" (staffing issue) and "work with somebody that doesn't know the floor" were cited by nursing assistants as the major causes of injuries.

When asked about workplace health and safety concerns, most managers focused only on ergonomics issues and the no-lift program. However, nursing assistants also discussed a number of other occupational hazards, none of which were acknowledged in management interviews. For example, focus group participants mentioned that there were a number of residents with infections such as Methicillin Resistant Staphylococcus Aureus (MRSA), Vancomycin-Resistant Enterococci (VRE), tuberculosis (TB), or shingles. There was usually "no report" or "partial report" from nurses or coworkers at shift change about infectious diseases in residents, and they believed this put them into dangerous situations. One participant said, "I would have a patient for a year; I didn't know for that all year she had something in her eyes that is contagious..."

Trip hazards were mentioned in five centers. Nursing assistants stated that they frequently tripped over electrical wires and cords and struggled with mattress hoses between two beds. One

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participant said, "You're tripping over the wires. Some staff could fall, and they've fallen. That is dangerous. We've complained about this frequently and nothing has been done so far." Participants also attributed falling and getting hurt to "hurrying" and "rushing."

Nursing assistants stated that they and their coworkers were frequently beaten, hit or kicked by combative or demented residents while bathing, shaving and feeding them. The resident assaults made them feel both physically and psychologically stressed. One participant said, "Sometimes what they do is scratch your hand when they are [demented], or your face sometimes. They can kick you if you are [alone]…I got hit in the face before." However, participants stated that the centers took no measurements to handle such kind of situations. In two centers, nursing assistants even reported being suspended after abused by residents. One participant described her coworker's situation: "There's no need for her to be suspended. She doesn't get paid for it until they find out it's not her fault, it's the resident's fault. She loses three day's pay."

Both nursing assistants and managers agreed that needle sticks and chemicals were not big concerns for nursing staff in the centers. Participants in focus groups said that "nurses pretty much dispose of their [sharp] items very quickly" and "they don't leave many things hanging around;" therefore, "the risks are very minimal."

Work organization

Both common and different opinions were voiced between nursing assistants and managers about opportunities for worker participation such as staff suggestions and follow-up, and involvement in decision-making (Table 2). Nursing assistants and managers also differed in their perceptions of other work organization issues, such as workload and staffing, work schedules, communications, teamwork, as well as respect and appreciation.

Double workload, short staffing and time strain were frequently mentioned by nursing assistants in focus groups. One participant said, "If two people are called out... it's like doing a double job. It's not only your job, [but] you're doing another person's job." Another said, "You don't even have the time. You have to hide and eat your meal. Quick, quick, get it down, get it down. So, time is an issue." Managers did not mention these issues in the interviews.

Nursing assistants in four centers described "set schedule" and difficult schedule switches as problems in the centers. Focus group participants said, "If you call out on the weekend then you have to make it up the next weekend." "I got it switched, but I had to wait until they found somebody to fill my position. And it's like pulling teeth to get a day off." None of the managers in the four centers identified scheduling as a problem for employees, while scheduling in the other three centers seemed to be more flexible and responsive to employee needs.

Focus group participants in six centers mentioned communication problems between departments, shifts, between nurses and aides, and between managers and employees. One nursing assistant expressed her opinion about the communication with an upper-level employee, "We're not getting answers. You cannot bring anything up to them. They don't want to hear it. They don't care." Another one said, "Because since nobody listens I would think let me write a note to someone... And I stick it in her [unit manager] board and never get answers." No managers noted these issues in their interviews.

Lack of teamwork was described in focus groups at five centers. Nursing assistants expressed that it was "hard to work in teams" because of short staffing and time strain. One participant said, "I don't think we work as a team. If you're on the B side, nobody will go to the A side to answer a call, or nobody in A side will come to the B side, so help you. If there's a light going on...for five, ten minutes, and nobody will answer it." But the manager in the same center

expressed different views, "I think the way that the team works together here is something that really makes me proud." Most managers did not mention teamwork in the interviews.

Managers in all seven centers expressed their respect for nursing assistants' work. They mentioned that nursing assistants are "the most valued employees in the building" and they usually "listen and treat people fairly." But nursing assistants still seemed to feel a lack of respect and appreciation from upper management. One participant said, "I feel like nobody. I feel like I'm not a CNA. They [Nurses] treat me like a CNA is nothing." Another one said, "…not to be their [nurses] slaves for them to tell us, you need to do this…why are you treating us like…we're dogs."

Psychosocial concerns

Stress was mentioned as a prevailing concern by both nursing assistants and managers in all seven centers. One focus group participant illustrated the apparently overwhelming stress, "When I go home, and I can still hear call lights. I took a nap the other day, and I was waking up…because I'm thinking we have to put people to bed. I was walking out to go to my car, and I can hear beep, beep."

Work-family conflict was recognized by nursing assistants as one of the major reasons for stress. Focus group participants mentioned stress resulting from "scheduling, managing time, homes" and "trying to balance work life, home life." A few managers noticed that personal issues could contribute to stress but did not link it to the time conflict between work and home needs.

Nursing assistants expressed other sources of stress, which managers did not mention in their interviews. Work organization issues were cited frequently as the major sources of stress in the work environment: Poor teamwork, lack of respect and appreciation, no control of the work

schedule, poor communication, and little involvement in resident care planning. Physical risks associated with infectious diseases and combative residents were also discussed as making work more stressful by nursing assistants. One participant said, "With job stress, I notice a lot of times with the nurses, they like to take their anger out on CNAs; if they're having a bad night, they're trying to make us do more work than we're supposed to do in a timely manner..."

Health promotion programs

In line with our selection criteria, there were substantial differences between potential intervention centers and control centers in their past and ongoing wellness activities. In the three candidate control centers, different kinds of wellness activities have been implemented: Staff could buy food from the kitchen or cafeteria with a reduced price; there were fresh and healthy salads and sandwiches, yogurt and juices in vending machines; stress classes, stress reduction therapy, and a hotline to psychologists were offered; many employees participated in "biggest loser" or "weight watcher" program; and smoking cessation programs helped some employees to quit smoking. Most managers expressed their pride about these activities, and nursing assistants reported strong willingness to continue or restart these programs.

In the four candidate intervention centers, a number of informal wellness programs had been initiated, but then stopped due to time not being convenient or people losing interest. However, both nursing assistants and managers showed great interests in and willingness to initiate participatory health promotion programs in these centers. Healthy eating, stress reduction, weight control, smoking cessation, and on-site exercise were five major areas for which interest was expressed in all centers. However, both groups realized that time was the biggest challenge for any workplace program. Employees only have a half-hour for lunch while at work, so "15 to

20 minutes" was seen by managers and nursing assistants to be the maximum time allowable for any on-site health promotion activities.

DISCUSSION

In this large qualitative study of nursing home employees, both common and differing issues were identified between nursing assistants and managers. There was agreement on the importance of ergonomics concerns, especially resident handling and the benefit of the new no-lift program, the prevalence of stress, and both the desire for and the barriers to participatory health promotion programs in these centers. However, there were major differences between the two groups in their perceptions of work organization issues. In addition, managers failed to comment on many physical and psychosocial risks in the work environment that concerned the workers.

Nursing assistants' perceptions of work organization concerns have been described previously. Several studies have reported that staff shortage, lack of teamwork, not being treated with respect, lack of appreciation, and poor relationship with supervisors were factors that contribute to poor working conditions for direct caregivers, along with difficulties in recruitment and retention (Bowers, Esmond, & Jacobson, 2003; Kemper et al., 2008; Nursing Home Community Coalition of New York State, 2003). Staff shortage is a chronic issue for this company and others in the long-term care sector. Over 90% of US nursing homes do not have enough staff to meet federal standards for quality of care (Feuerberg, 2001). Our qualitative findings add to the evidence that employees' physical and psychological concerns in the work environment may be relevant to staff shortage. Policies and programs that help to meet physical and psychological demands of caregivers might in turn reduce staff turnover and improve quality of care and resident health outcomes.

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The different perceptions between nursing assistants and managers on work organization

issues suggested poor worker-management communication. Although the managers each stated

an interest in building a more participatory culture, they might not be as knowledgeable as they

thought about problems that distressed their employees. The differing opinion about employee

concerns by managers could work as a contributing factor for workplace injuries and illnesses,

higher worker stress, burnout, and job dissatisfaction among nursing assistants. Previous studies

reported that businesses that actively engage employees in decision-making generally experience

lower injury and illness rates as well as improved productivity compared to those that do not

(Shannon et al., 1996; Bull, Riise, & Moen, 2002).

From a broad view of workplace health and safety, managers did not mention the physical

risks related with infectious disease, combative residents, trip hazards, and prolonged standing.

Primary psychosocial stressors like work organization and physical hazards in the work

environment, cited by nursing assistants, were also neglected by managers. Parker et al. (2007)

reported that the work environment perceived by managers is a much safer and friendly place

than that perceived by employees. Other investigators have posited that the differing perceptions

between employees and managers might indicate limited management participation or

engagement of employees in the health and safety improvement process (Mullen, 2004; Shannon

et al., 1996; Zohar, 2002).

Effective health promotion is important to stabilize the long-term care workforce.

Occupational health and ergonomics programs have been shown to be effective in reducing

musculoskeletal injuries (Collins, Wolf, Bell, & Evanoff, 2004; Hignett, 2003) and combative

assaults (Fitzwater & Gates, 2002), in turn reducing staff turnover and improving quality of care

(Morgan & Konrad, 2008) in long-term care centers. An integrated perspective on employee

health suggests that such programs might be broadened in scope in order to address other work environment problems. Healthy workplaces should involve employees in decision making, promote learning, reward appropriately, and attend to interpersonal relationships. There is also evidence that participatory programs are more effective in engaging of employees of lower socioeconomic status (Punnett, et al., 2009). From the authors' perspective, a comprehensive, ecological approach to health promotion has the potential to decrease absenteeism, lower medical claims costs, improve recruitment and retention of employees, and contribute to the individual employee's overall well-being and quality of life.

Study Strengths and Limitations

The strengths of the study include the large numbers of focus groups and nursing assistants from multiple sites, units, and shifts; the coordinated scripts for paired focus groups and management interviews; and the internal consistency of findings within groups and across seven centers.

However, the generalizability of the results may be limited to the extent that these seven nursing homes were all located in New England area. The different perceptions between nursing assistants and managers might be due to the different format of questions asked within the two groups, or the fact that the manager interviews lacked the benefit of the group processes that may have stimulated a broader range of issues being raised in the focus groups. Also, the managers might be disadvantaged by avoiding discussion about the negative impacts of corporate policies from their positions. In this study, the concerns and opinions expressed have not yet been validated by observation of the actual hazards in the work environment.

CONCLUSIONS

We used an exploratory qualitative study to explore the common and different perceptions between caregivers and managers about their views on workplace health and safety, work organization and psychosocial concerns in long-term care centers. This study provides a description of the current work environment issues in U.S. nursing homes. Many of these issues are amenable to primary prevention strategies. Future intervention programs might benefit by focusing on promoting empowerment of nursing assistants and better communication between upper management and front-line caregivers. Such intervention programs would help to achieve more comprehensive reduction of occupational risks and build a more inclusive, participatory organization, which will benefit both managers and caregivers.

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Table 1

Focus Group and Management Interview Topic Outline

Focus Group Topic	Management Interview Topic
Health and Safety Concerns and No-lift Program	
1. We would like to start by hearing your general thoughts about workplace health and safety in the nursing center as a whole.	1. Are there any health concerns-either occupational or general at the center that you'd like to see addressed?
2. We are interested in hearing your views about resident handling at the center and how it relates to your health.	2. How do you think the no-lift program is working?
3. Please describe any changes at work over the past year that might have affected you health or safety.	3. Have you noticed any change in employee injuries or attitudes since the implementation of the no-lift program?
Worker participation	
4. We would like to ask you about ways in which you are able to have a say or give your opinions at your center.	4. If employees come up with ideas for better organization or to reduce stress or improve service, how would that be handled?
(a) Could you tell us what kind of say you have in how work is scheduled or organized?	5. Could you tell us about other ways that workers participate in decision-making or contributing ideas at the center?
(b) If you have opinions or suggestions about how to improve the workplace, how are your opinions or suggestions treated by your supervisor or by management in general?	6. Do you think workers could be more involved in participating in and in planning health promotion activities?
(c) Tell about ongoing ways management asks for your opinions.	
(d) Please talk about ways in which you would like CNAs to have more input or involvement in wellness or health and safety issues.	
Health Promotion Programs	
5. What kinds of health and safety or wellness activities do you think your workplace could offer to help improve your health inside or outside of work?	7. In terms of wellness activities, what have you tried in the past year?
	8. From your perspective, what kind of interest is there in health-related programs among the staff?
6. Are there programs or activities that could be provided at your workplace to help you and your co-workers support each other?	9. In your opinion, are there opportunities or could there be opportunity for future health promotion activities?

Table 2

Comparison of Worker Participation Concerns between Focus Groups and Management Interviews

Focus Groups	Management Interviews
Staff suggestions and follow-up	
Centers with disagreement "Because if we ever say anything to anybody it goes in one ear and out the other." (Center A)	"We typically ask their opinion for most things that we can." (Center A)
Centers with agreement "We have an open policy here: open door. You can go into see the administrator. You can go to the director. You can go to whoever you feel comfortable with to speak about anything, and it's always taken care of since I've been here." (Center B)	"...having them come to us and then the best thing we can do is support the idea and help them follow through with it." (Center B)
Staff participation and involvement in decision making	
Centers with disagreement "I think the aides should be more involved in the care plans but we're not." "When they make these changes they don't -- Involve us." (Center C)	"So it's giving people, the line staff, and the control over the decision... I don't make any of the decisions in this facility...The CNAs make the decisions on the floor." (Center C)
Centers with agreement "They are pretty good at listening to us and we usually have the mandatory monthly meeting throughout this building for all wings for any concerns or anything new coming... if anybody has concerns, they'll try to handle it." (Center D)	"We're trying to develop as a center is getting our direct care staff really be empowered to make decisions that affect what they do from day to day." (Center D)