

NIOSH Training Program Grant Final Progress Report

University of Connecticut School of Medicine
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TABLE OF CONTENTS

	Page
Title Page	1
Table of Contents	2
Abstract	3
Significant Findings	4-5
Body of the Report	6-10
List of Publications	11-12

ABSTRACT

The University of Connecticut's Occupational Medicine Residency Training Program was established in the fall of 1993 in response to recognized national needs for training in the field of worker health as well as in the broader area of environmental hazards. This innovative model for training in Occupational and Environmental Medicine (OEM) at UCHC represents a linkage between multiple stakeholders in the government, labor, corporate, and research communities, and seeks not only to train physicians for practice within these disparate communities, but also to enhance training and expertise in population medicine and public health in the Medical Center, the University, and the state. The residency program focuses on investigative skills, both clinical and population-based, that assist in evaluating cases of work- or environmentally-related illness and their underlying causes, while placing a premium on the development of preventive measures that control and reduce new disease. Residents have taken the lead on investigations of large outbreaks of lung disease occurring in such diverse places as a metal machining plant, and a large state office building; their work has led to national recognition in peer-reviewed publications and presentations at professional society meetings. Most importantly, the training program has proven uniquely flexible and responsive to the new and substantial challenges to the public's health following the events of September 2001. Rapid development and promotion of training modules targeted to recognition of potential terrorist use of biological, chemical, and radiation hazards, and guidance in the public health response has been one result of the expertise developed in this program; a more visible effort has been resident involvement in the effort to vaccinate first responders against the threat of smallpox. Physicians in this training are functioning on the front lines of response to protect the health of workers and the public. It is a unique and innovative model for OM training, with few comparable programs in the U.S. Since the submission of our last NIOSH grant, the OEM residency has both been strengthened through interdisciplinary collaboration and its location in the forefront of a new Center for Public Health, and challenged by faculty departures and loss, programmatic cutbacks at outside sites, and national problems in recruitment of residents. Areas of specialty expertise within the DOEM have provided residents with in-depth experience in the evaluation of upper extremity disorders, illness arising from indoor environments, medical center occupational health, and pregnancy exposure risks. Major collaborating institutions outside of the University of Connecticut consortium include the Connecticut Department of Public Health, United Technologies/Pratt and Whitney, Electric Boat/General Dynamics Corp., and Travelers Insurance. As of July 2009, we will have trained five residents in this cycle and have one additional resident beginning the academic year. All faculty have external funding to support their research. Research activities focus on ergonomics, indoor environments, hospital employee health, and reproductive hazards. The program continues to serve as the medical expertise in outbreak investigations, policy development, and research support for the occupational branch of the CT Department of Public Health. The MPH program has been consolidated under a stable directorship, and linkages to the public health and environmental health departments at the main UConn campus in Storrs laid the foundation for a new Public Health Institute. Core courses in the MPH program are complemented by specialist courses for occupational medicine trainees; these include industrial hygiene, occupational and environmental epidemiology, and occupational disease. The UCHC Occupational Medicine residency faces challenges related to funding, applicant pool, and faculty movement that may threaten it in the longer term.

SIGNIFICANT FINDINGS

- Notice of continued full accreditation was received from ACGME: effective date March 2006 with a full five-year period of accreditation to run through 2011. The program was approved to continue to train a total of four residents at one time; two in the academic year and two in the practicum. No deficiencies in the program's compliance with ACGME criteria were noted in the accreditation notice, with only two very minor citations regarding paperwork.
- Available residency positions were approximately half-filled from July 2004 to 2009. The residency suffers from nationwide challenges in the applicant pool and from a time of national decline in interest in this field
- In the 2004-09 cycle, we trained five residents, for a total of 16 in the past ten years of training. The track record of the program in recruiting and training members of traditionally underrepresented groups has remained exceptional; four of the nine most recent residents are women; five of the last ten trainees were African-American or Afro-Caribbean
- As a direct result of the Division's commitment to education, the amount of time dedicated to O/E health in the University undergraduate medical curriculum remains high and has not been altered despite competition for time within the curriculum. Training for UME stands at over 40 hours, and three of the four UCHC primary care residencies (Primary Care Internal Medicine, Internal Medicine, and Family Medicine) continue to require trainees to participate in the DOEM's clinical and educational activities.
- Clinical training opportunities in the residency continued a slow but steady improvement:
 - Drs Meyer, Dangman, Cherniack, Trapé, and a new addition, Dr Aliyu, all supervised residents in the clinic, an increase in physician preceptorial work since the past submission
 - The services of a certified industrial hygienist (Ms. Anne Bracker) were complemented by addition of another 80% FTE hygienist, (Nancy Simcox) with particular expertise in the built environment). This contribution remains one of the particular strengths of this clinic.
 - The longitudinal teaching clinic in upper extremity disorders and musculoskeletal medicine, created in the Spring of 2001, and which draws on a large population base of patients with carpal tunnel syndrome, hand-arm vibration, and related disorders, continues to provide an intensive training in an area critical to the clinical practice of OEM.
 - A clinic specifically devoted to health problems related to indoor air pollution, providing both medical and public health expertise in an area that has become a growing national problem was established by Dr Storey in 2002, and has proven one of the few centers of expertise in this arena in the country.
 - Resident participation in the functions of the medical center occupational health program was formalized under the direction of Dr Trapé, allowing them to develop a specific set of needed skills in OEM, including familiarity with the hazards and management strategies of an employee health service in a major hospital and research institution, performance of surveillance exams for special groups of workers, fitness-for-duty assessments, the development of new policies and procedures for a medical center program, and clinical care of injured health-care workers.
 - Continuation and expansion of a pregnancy hazards clinic under Dr Meyer's direction
- Current major practicum sites still include:
 - The Environmental Epidemiology and Occupational Health Division of the Connecticut Department of Public Health
 - The Travelers Insurance Company
 - UTC / Pratt & Whitney
 - The previous rotation at General Dynamics/Electric Boat was dropped from the practicum sites by mutual agreement of the site directors. The site, 60 miles away from Farmington, required inordinate travel on the part of residents
- Full accreditation by CEPH of the MPH program and curriculum occurred in 2007. The DOEM faculty remain principal instructors in the environmental and occupational components of the program.
- Residents were principal developers of educational programs in occupational history-taking for the

first- and second-year medical students.

- The research effort in the DOEM remains extensive and complements both the clinical effort and the training offered to the residents. Faculty in the Division are currently involved in an extensive variety of research projects
- The University strategic planning process led to creation and approval of a new Public Health Institute centered in the University, with linkages established between the Health Science Center campus, the main campus at Storrs, and the State Department of Public Health.
- The OEM residency was relatively stable in faculty numbers through most of the project period. Toward the end of the project period, the residency saw the departure of Dr Storey (Division Chief and Director, Center for Public Health) and Dr Dangman, as well as the sudden illness and death (Sept 2009) of Dr Marcia Trapé.

BODY OF REPORT INCLUDING CONCLUSIONS

Background and specific objectives

Formal training opportunities in occupational and environmental medicine (O/EM) initially dramatically increased over the course of the past 20 years in the U.S, but have more recently exhibited a contraction, to the point where only about 100 practitioners are graduated for residency training programs. The training of O/E health practitioners thus remains a concern. The Institute of Medicine reports that documented the deficiencies in training of health practitioners in this area complement a body of literature which reports that general medical education and residency training in O/E disease is inadequate and a threat to good medical practice and the public's health. The dearth of trained occupational and environmental medicine specialists, coupled with the inability of primary care providers to identify, initiate treatment for, and make appropriate referrals for O/E disease, results in an unacceptable level of misdiagnosis of O/E illness. The intensive restructuring of health care in the past decade has challenged health care training generally. Managed care has also made substantial inroads on the practice of O/EM, adding a level of administrative complexity, and often interjecting a level of case management which sometimes restricts a patient choice to non-specialists. At the same time, in an increasingly competitive marketplace medical practitioners with inadequate training are often asked to provide surveillance and pre-placement examinations and to participate in return-to-work decisions for employers. Lastly, patients, workers, and communities often turn to their physicians to provide local expertise in the face of public health risks and environmental concerns. Heightened awareness of the risks of biological, chemical and radiological attack has come in the wake of the events of Sept 11, 2001, the subsequent dissemination of anthrax-contaminated mail, and the smallpox vaccination program. These occurrences serve to underline the critical need for a cadre of physicians with training in population-based medicine and evaluative skills in epidemiology, toxicology, environmental health, and administration.

These current and long-standing concerns and changes in the practice and organization of medicine have influenced the goals and objectives of our residency training program. The residency was created in 1993 as a natural extension and appropriate expression of the larger mission of the Division of Occupational and Environmental Medicine [DOEM]; namely to educate residents, medical students, other house officers, faculty members, and the community of health professionals to recognize occupational and environmental contributors to disease and to incorporate this recognition, and evaluative skills in public health, into their management strategies. As a direct result of the Division's commitment to education, the amount of time dedicated to O/E health in the University of Connecticut (UConn) undergraduate medical curriculum continues to stand at over 40 hours, and three of the four UCHC primary care residencies (Primary Care Internal Medicine, Internal Medicine, and Family Medicine) still require either rotations or didactic activities of their trainees from the DOEM's clinical and teaching faculty. The DOEM has also worked to strengthen O/E health curricula for continuing educational activities both for primary care physicians and occupational health professionals, by sponsoring conferences on such topics as the health effects indoor environments, and an ongoing yearly conference and working group on state-based occupational disease surveillance. Residents have been included not only in the development and planning stages of our CME activities, but also have benefited through expanded interdisciplinary educational experiences and administrative/management skills development that occur coincident with development of CME activities.

In addition, the UCHC residency program focuses on investigative skills, both clinical and population-based, that assist in evaluating cases of work- or environmentally-related illness and their underlying causes, while placing a premium on the development of preventive measures that control and reduce new disease. Resident have taken the lead on investigations of large outbreak of lung disease occurring in such diverse places as a metal machining plant, and a large state office building; their work has lead to national recognition in peer-reviewed publications and presentations at professional society meetings. Most importantly, the training program has proven uniquely flexible and responsive to the new and substantial challenges to the public's health following the events of September 2001. Rapid development and promotion of training modules targeted to recognition of potential terrorist use of biological, chemical, and radiation hazards, and guidance in the public health response has been one result of the expertise developed in this program; a more visible effort has been resident involvement in the effort to vaccinate first responders against the threat of smallpox. Physicians in this training function on the front lines of response to protect the health of the public, and present the visible face of the Health Center's

capabilities in the area of risk assessment and risk communication. The program has developed into a unique and innovative model for OEM training, with few comparable programs in the U.S.

Results and discussion:

Notice of continued full accreditation was received from ACGME with an effective date of March 2006 and a full five-year period of accreditation to run through 2011. The program received continued approval to train a total of four residents at one time; two in the academic year and two in the practicum. The next site visit is expected in the fall of 2011. Only minimal (paperwork documentation) deficiencies in the program's compliance with ACGME criteria were noted in the accreditation notice.

Resident recruitment to the program has remained steady, and until 2007 all available funded positions were filled. A general cutback of GME-funded positions occurred and affected all residency programs in the UCHC training consortium, and therefore previously available funds for trainees were no longer available to supplement NIOSH-funded positions. The faculty attempted to remediate this situation through alternative sources of funding. In 2008, Dr Meyer obtained a training grant in cancer prevention and control from the ACS which was intended to fund an additional resident, in addition to helping to establish a fellowship and career path for trainees interested specifically in occupational cancer. This grant also helps to expand traditional ties with the CT DPH, as the CT Tumor Registry, the oldest in the country, is an active participating site. Emphasis should again be placed on the substantial bonds of continuity between training in the primary care / internal medicine programs of the UConn Health Center and the OEM residency, which continues to produce a pipeline of highly-qualified and skilled applicants into the program. Our graduates have helped fulfill our intentions to train practitioners for both regional and national needs, with several continuing involvement at the UConn Health Center and the MPH program, helping to meet the expanding demand for services which the Division and institution are experiencing, and working in regional hospitals.

Activities of the Section of Occupational and Environmental Health (SOEH) were considerably strengthened over the period, with the approval and initiation of a new Center for Public Health and Health Policy centered in the overall University, with linkages established between the Health Science Center campus, the main campus at Storrs, and the State Department of Public Health. Dr Storey, as Director of the SOEH, was named co-chair of this initiative, which promises to strengthen the University's teaching and outreach role in public health within the state. The SOEH is one of three major divisions within the new center, which represents a commitment on the part of the University and Health Center to place public health on a level with the Health Center's other signature programs in cancer, cardiovascular disease, and musculoskeletal medicine. Extensive resources will be placed into recruitment of new faculty in relevant areas of public health, expanding the range of opportunities available for training in the field within the University. Concomitant with the increased visibility and resources anticipated as a result of the establishment of the new Center, other initiatives new in this past cycle will increase the visibility and presence of OEM within the public health curriculum. A concentration in occupational and environmental health has been a desired addition to the MPH curriculum; this represents only the second concentration available to master's students, and recognizes the extensive teaching effort on the part of the SOEH in the overall MPH program, and with the new full accreditation renewal by the CEPH, becomes a current objective. In addition, sufficient courses and teaching expertise were identified to enable the institution of two Doctor of Philosophy (PhD) degree programs in occupational & environmental health and in social and behavioral sciences. Using resources from the Health Center/MPH program and the main university campus at Storrs, including the program in occupational health psychology which is centered there, a multidisciplinary PhD program in OEH has been approved by the state, and enrolls its first doctoral students in September of this year. The establishment of the public health center with the SOEH central to the Center's planning and mission will prove an asset to the residency program and, as noted, extend the range of available faculty, courses and activities.

Since the submission of our last NIOSH grant, the OEM residency has been strengthened through continuity of faculty, enhanced educational, research and clinical offerings, and increased interdisciplinary collaboration. NIOSH funding, including the Training Grant, was viewed as evidence of the division's potential to contribute to the public health signature program and enabled the SOEH to leverage additional resources from the university. Dr. Meyer, who had assumed the job of residency program

director from Dr Michael Grey at the beginning of the past training grant cycle has significant experience in resident education, having been program director at WVU and twice chair of the Occupational Medicine Residency Directors Association. He continued in this position in the 2004-09 grant cycle, also teaching the courses in Occupational Epidemiology and Occupational Diseases in the MPH program. With other faculty, he has been serving as a preceptor/supervisor for the residents' clinical and research activities. Dr. Meyer also provides additional research breadth, reputation and strength in the area of occupational reproductive hazards, a primary focus of both his investigative and clinical work, and in occupational disease surveillance. The longstanding consultative relationship with the State Department of Public Health has been considerably strengthened over the past five years, as the DPH continues to be awarded grants for capacity-building in occupational surveillance and environmental health monitoring. Dr Meyer, Dr Morse, and other faculty from the SOEH have served as major consultants on these grants, and participation by the residents in this major practicum site facilitates both the DPH's and the SOEH's ability to work collaboratively with federal, state and local public health agencies around disease surveillance models. A novel clinical and research arena has also evolved with substantial input from Dr. Meyer: SOEH partners with the Pregnancy Exposure Information Service (PEIS) in the Department of Genetics to offer consultative services for women with concerns about the potential impact of work or environmental factors in their pregnancies or intended pregnancies, and to obstetricians with related questions. This has led to the establishment of a pregnancy hazards clinic, with extensive participation by the OM residents in the evaluation and control of hazards in this arena.

Clinical training opportunities in the residency were expanded considerably during this and the prior grant cycle and continue to provide a first-rate experience in the practice of occupational medicine. Drs Meyer, Dangman, Cherniack, Trapé and Aliyu supervises residents in the clinic, and thus teaching is considerably enhanced. The services of a certified industrial hygienist (Ms. Bracker) is one of the particular strengths of this clinic; residents are able to receive in-depth instruction in taking an exposure history, as well as having expertise in workplace assessment available at the point of patient care. Additionally, workplace site visits led by Ms. Bracker can be scheduled in order to obtain clearer information on patient exposures. This service was expanded with the addition of a second IH, Nancy Simcox, during the grant period. Residents are given primary responsibility for all new patients. The longitudinal teaching clinic in upper extremity disorders and musculoskeletal medicine which was created in the Spring of 2001 draws on a large population base of patients with carpal tunnel syndrome, hand-arm vibration, and related disorders, and provides an intensive training in an area critical to the clinical practice of OEM. Residents are able to avail themselves of Dr. Cherniack's knowledge and experience in this field, and several have participated in research projects derived from the problems seen in this clinical setting. Drs Storey and Dangman established a clinic specifically devoted to health problems related to indoor air pollution; this clinic provides both medical and public health expertise in an area that has become a growing national problem, and has led to publication of a guidance document for clinicians in this area, which was supported, published, and disseminated by the Environmental Protection Agency (EPA). Finally, resident participation in the functions of the medical center occupational health program has been formalized under the direction of Dr Trapé. This allows them to develop a specific set of needed skills in OEM, including familiarity with the hazards and management strategies of an employee health service in a major hospital and research institution, performance of surveillance exams for special groups of workers, fitness-for-duty assessments, the development of new policies and procedures for a medical center program, and clinical care of injured health-care workers. The current job market for clinically-related positions (and our recent graduates' success in this area) emphasizes the importance of their training in this setting.

Consolidation of relationships with practicum sites has been achieved. The trainees are now offered a core group of high-quality educational sites through which they can achieve the goals of practicum training, and meet the requirements of the ACGME for training within the real world of work. Continuity of training with our current major sites continues; the exception being a lapse in continued training with the General Dynamics Electric Boat facility in Groton (loss of which, however is substituted for by increased links with Pratt & Whitney, fewer demands to travel to a distant practicum site, and increased time spent at the present group of sites). Our current major training sites are:

- The Environmental Epidemiology and Occupational Health Division of the Connecticut Department of Public Health, where the residents obtain training in outbreak investigation and the public health aspects of occupational medicine
- The Travelers Insurance Company, which provides expertise in disability management and workplace intervention strategies
- UTC Pratt & Whitney Corp, a large defense industry manufacturing aircraft engines, with whom an earlier affiliation was revitalized in the current grant cycle.

Teaching in occupational and environmental health has been broadened throughout the medical center and university as a result of support under this grant. Faculty and trainees participate in the teaching of medical students throughout the medical school curriculum. Dr Storey was the principal leader in this effort, expanding the undergraduate curriculum to 40 hours of O/EM training, likely the most extensive medical school training program in OEM in the country. Residents in the UCHC Internal Medicine programs participate in required rotations in the clinical work of the Division as well as being offered elective rotations in the field, of which 10-15 IM residents avail themselves each year; faculty participation in this effort, led by Dr Trapé, is principally responsible for the ongoing supply of interested candidates for the OM residency.

Important modifications have also occurred in the MPH program during the last grant cycle, that are clearly enhancing resident education. Revision of the MPH curriculum, primarily to assure a standard set of requirements, was achieved under a new director, Dr Gregorio, and CEPH re-accreditation of the program was successfully obtained in 2007. The expected effects on resident training will be to assure a two-year curriculum in which specific core courses, electives, and competencies will be achieved, as well as promoting a specialized training pathway that could potentially lead to a concentration or certificate in occupational and environmental health. The SOEH faculty remains in the forefront of teaching in the program, and offerings have been stable over the five years encompassed by this grant. Following his arrival in 2001, Dr. Meyer assumed major responsibilities for MPH teaching within the Section, including the Occupational and Environmental Disease and Occupational and Environmental Epidemiology courses, which were offered in the summer of 2007, and fall of 2008 respectively. The Toxicology/Risk Communication course is now firmly established on a two-year cycle and is given by Dr. Gary Ginsberg, whose teaching has been well received. Additional courses taught by the SOEH faculty, currently including Ergonomics (Dr Warren), Occupational Health Policy (Dr Morse) and Industrial Hygiene (Ms Bracker) provide a very thorough curriculum in the field of occupational health, and taken as a whole, serve as exceptional preparation for the residents, as well as other MPH students, for practice in the field. New offerings for related electives include courses on Health and the Built Environment and a Cancer Epidemiology course which will have an occupational component and provide a base for the new ACS training funding in cancer control and prevention with an occupational focus.

An important new initiative comes through the NIOSH mandates for ERC collaboration with training programs in their region. As a result we have just begun to implement a set of joint collaborations with the Harvard ERC, including joint colloquia and research seminars, a program of career competency seminars for the residents throughout the year, joint educational didactic sessions with a focus on OEM competency review, and plans to pilot test and offer the new Harvard web-based Grand Rounds as an additional component of our instructional program.

The research effort in the SOEH is extensive and complements both the clinical effort and the training offered to the residents. Faculty in the Division are currently involved in, or has recently published, the following research:

- Assessment of the effects of vibratory tool use, including musculoskeletal and vascular disorders, in a large cohort of shipyard workers
- Evaluation of musculoskeletal disorders in dental hygienists
- The effect of work organization and workplace stress on health and the delivery of medical care services
- Capture-recapture analysis of occupational surveillance data to estimate the burden of work-related

illness

- Evaluation of an outbreak of lung disease in machinists using metal-working fluids
- Assessment of the role of indoor environments in causing lung disease, including asthma and hypersensitivity pneumonitis
- Evaluation of the health of schoolteachers and the effects that hazards of the indoor environment and again school infrastructure may be having on their health
- Improvement of the state capacity for conducting occupational disease surveillance, including outreach to primary care and specialty physicians for reporting
- Construction of a dedicated facility for the study of hearing and communication disorders and for the development of technological solutions to improve communication in safety-sensitive positions such as air traffic control
- An assessment of workers compensation reform efforts in the 1980-2000 period
- Analysis of birth registry data to determine maternal occupations at risk for small-for-gestational-age and premature deliveries

Five of the last six graduates in this training cycle have continued in practice in our local area. Despite small numbers, all facets of OM practice are represented in the placement of graduates; they have found jobs in academia, industry (principally insurance/financial), public health, and private/clinical practice. The successful track record of the program in recruiting and training members of traditionally underrepresented groups should also be stressed; five of the nine most recent residents (since 2001) are women, and five of ten were African-American or Afro-Caribbean.

Conclusions:

The UCHC Occupational Medicine residency has continued to grow and expand training opportunities in occupational medicine, as well as challenging residents to respond to new and current threats to worker and public health. The funding available for this training from NIOSH has been integral to its success, and continuation of this effort will lead to the continued development of skilled practitioners who can assume leadership roles in a variety of work-related and public health arenas. Present challenges come from two quarters. First, loss of faculty near the end of the grant period has proven problematic in both clinical instruction and leadership at higher levels. Toward the end of the project period, the residency saw the departure of Dr Storey (Division Chief and Director, Center for Public Health) and Dr Dangman, as well as the sudden illness and death (Sept 2009) of Dr Marcia Trapé. These losses have been partially met with the appointment of Dr Aliyu as director of employee health services and Dr Meyer as Section head, but a gap in personnel, as well as in leadership of the Public Health Institute, remains. Secondly concerns that tie funding and the dearth of qualified applicants have affected recruitment into the program; these represent more national trends and beg for national solutions. Although outside the scope of this project report's time period (2004-09) the DOEM has agreed to terminate the residency program at the end of the 2010 academic section, in light of the concerns expressed above.

PUBLICATIONS IN THE DIVISION OF OCCUPATIONAL AND ENVIRONMENTAL MEDICINE 2004-2009 arising from TPG Award

DOEM faculty/residents noted in boldface; residents (DOEM and UCHC) underlined

1. Baker BA, Katyal S, Greaves IA, Roeber Rice H, Emmett EA, **Meyer JD**, He W. 2007. Occupational medicine residency graduate survey: assessment of training programs and core competencies. *J Occup Environ Med* 49: 1325-1338.
2. **Cherniack M, Brammer AJ, Lundstrom R, Meyer JD, Morse TF**, Neely G, Nilsson T, Peterson D, Toppila E, **Warren N**. 2007. The Hand-Arm Vibration International Consortium (HAVIC): prospective studies on the relationship between power tool exposure and health effects. *J Occup Environ Med* 49: 289-301.
3. **Cherniack M, Brammer AJ**, Lundstrom R, **Morse TF**, Neely G, Nilsson T, **Peterson D**, Toppila E, **Warren N**, Diva U, Croteau M, Dussetschleger J. 2008. Syndromes from segmental vibration and nerve entrapment: observations on case definitions for carpal tunnel syndrome. *Int Arch Occup Environ Health* 81: 661-669.
4. **Cherniack M, Brammer AJ**, Lundstrom R, **Morse TF**, Neely G, Nilsson T, **Peterson D**, Toppila E, **Warren N**, Diva U, Croteau M, Dussetschleger J. 2008. The effect of different warming methods on sensory nerve conduction velocity in shipyard workers occupationally exposed to hand-arm vibration. *Int Arch Occup Environ Health*.
5. **Cherniack M, Brammer AJ**, Nilsson T, Lundstrom R, **Meyer JD, Morse T**, Neely G, Peterson D, Toppila E, **Warren N**, Atwood-Sanders M, Michalak-Turcotte C, Abbas U, Bruneau H, Croteau M, Fu RW. 2006. Nerve conduction and sensorineural function in dental hygienists using high frequency ultrasound handpieces. *Am J Ind Med* 49: 313-326.
6. **Cherniack M**. 2005. Upper Extremity Disorders. In: Rosenstock L, Cullen M, Brodtkin, Redlich C editors. *Textbook of Clinical Occupational and Environmental Medicine*, 2nd Edition: Elsevier Saunders. p 508-546.
7. Collins S, Landsbergis P, **Warren N**, LaMontagne AD. 2007. Stopping stress at its origins: addressing working conditions. *Hypertension* 49: e33.
8. D'Andrea DC, **Meyer JD**. Workers' compensation reform. *Clin Occup Environ Med*. 2004; 4; 259-271
9. Macdonald LA, Harenstam A, **Warren ND**, Punnett L. 2008. Incorporating work organisation into occupational health research: an invitation for dialogue. *Occup Environ Med* 65: 1-3.
10. **Meyer JD**, Nichols GH, **Warren N**, Reisine S. 2008. Maternal occupation and risk for low birth weight delivery: Assessment using state birth registry data. *J Occup Environ Med* 50: 306-315.
11. **Meyer JD, Warren N**, Reisine S. 2007. Job control, substantive complexity, and risk for low birth weight and preterm delivery: An analysis from a state birth registry. *Am J Ind Med* 50: 664-675.
12. **Meyer JD, Warren N**, Reisine S. 2010. Racial and ethnic disparities in low birth weight delivery associated with maternal occupational characteristics. *Am J Ind Med* 53: 153-162.

13. **Meyer JD, D'Andrea DC.** Occupational Tuberculosis. *in* Wright, W., ed. Occupational and Environmental Infectious Diseases. 2nd edition Beverly, MA. OEM Press. 2008.
14. **Meyer JD, McCunney, RJ.** Occupational Exposure to Noise. *in* Rom W, ed. Environmental and Occupational Medicine. 4th edition. Philadelphia. Lippincott Williams & Wilkins. 2006
15. **Morse T, Bruneau H, Michalak-Turcotte C, Sanders M, Warren N, Dussetschleger J, Diva U, Croteau M, Cherniack M.** 2007. Musculoskeletal disorders of the neck and shoulder in dental hygienists and dental hygiene students. *J Dent Hyg* 81: 10.
16. **Morse T, Dillon C, Kenta-Bibi E, Weber J, Diva U, Warren N, Grey M.** 2005. Trends in work-related musculoskeletal disorder reports by year, type, and industrial sector: A capture-recapture analysis. *American Journal of Industrial Medicine* 48: 40-49.
17. **Morse T, Grey, M, Storey, E,** and Kenta-Bibi, E. 2004. Occupational Disease in Connecticut, 2001. *Connecticut Medicine* 68: 131-138.
18. **Morse T, Meyer JD, St Louis T, Storey E.** 2005. Occupational disease in Connecticut: 2002. *Conn Med* 69: 329-334.
19. **Morse TF, Deloreto A, St Louis T, Meyer JD.** 2009. Are employment shifts into non-manufacturing industries partially responsible for the decline in occupational injury rates? *Am J Ind Med* 52: 735-741.
20. **Morse TF, Warren N, Dillon C, Diva U.** 2007. A population based survey of ergonomic risk factors in Connecticut: distribution by industry, occupation, and demographics. *Conn Med* 71: 261-268.