

Southern California Education and Research Center
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Final Progress Report

Reporting period July 1999 to June 30, 2004

Programs:

Industrial Hygiene Program
Occupational Health Nursing Program
Occupational Medicine Program (UCI)
Occupational Medicine Program (UCLA)
Center Administration
Continuing Education and Outreach Program
NORA Research Support Program

William C. Hinds, ScD, Center Director
UCLA School of Public Health
Los Angeles, CA 90095-1772

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Table of Contents

Title Page	1
Table of Contents.....	2
Abstract	3
Center Overview.....	4
Abstract, Significant Findings and Body of Report for Each Program	
Industrial Hygiene	10
Occupational Health Nursing Program	16
Occupational Medicine Program (UCI)	19
Occupational Medicine Program (UCLA)	23
Center Administration	28
Continuing Education and Outreach Program.....	38
NORA Research Support	53
List of Publications and Theses by Program Area.....	59
Industrial Hygiene	59
Occupational Health Nursing Program	66
Occupational Medicine Program (UCI)	67
Occupational Medicine Program (UCLA)	73

ABSTRACT

The Region IX NIOSH ERC for Southern California is composed of four core academic programs, five correlated programs, and Center Administration. The core programs are one each in industrial hygiene (IH) and occupational health nursing (OEHN) and two in occupational medicine (OM (UCLA) and OM (UCI). The correlated programs are Continuing Education and Outreach (CE/O), Hazardous Substances Training (HST), Hazardous Substances Academic Training Program (HSAT), Pilot Project Research Training Program (PPRT), and NORA Research Support Program (NORA/RS). Seven of these programs (the four academic programs, Center Administration, CE/O, and NORA/RS) are included in this Final Progress Report.

Major organizational changes to our center have been implemented during the reporting period. These changes have enhanced our programs and added new and important strengths to our Center. The Center administration moved from USC to UCLA on July 1, 2000. Dr. William Hinds, formerly Associate Director, took over as Director from Dr. John Peters at that time. Also the UCLA/USC occupational medicine residency program moved to UCLA with Dr. Philip Harber as Director. The continuing education program moved to UCLA and Claudia Molina became director in 2001. It continues to be an important source of education and outreach for occupational safety and health professionals in Region IX through its high quality, multidisciplinary education and outreach activities.

A new program for NORA Research Support was started in 2002 with Dr. Dean Baker of UC Irvine as Program Director. Its goal has been to support implementation of the National Occupational Research Agenda (NORA) by facilitating interdisciplinary research in NORA priority areas and supporting research training of doctoral students in ERC programs. The IH, OEHN, and OM programs continue as well-established programs with stable student enrollment and core faculty. A new ERC Center website has been established at <http://www.ph.ucla.edu/erc/>.

The complexion of the field of occupational health and safety is continually changing with the growing recognition of new occupational health and safety problems, such as repetitive trauma, homeland security and disaster response, and the expansion of occupational health and safety to include more environmental issues. Because of these changes we have introduced more than 14 new or modified courses in our core academic programs during the reporting period. The changes in the nature of work have created significant psychosocial stress in the work environment. This stress can lead to cardiovascular disease, hypertension, musculoskeletal disorders and psychological problems. In response to these changes we have undertaken an ERC-wide effort to develop courses, field practicum, and research in the area of psychosocial stresses in the workplace.

Through these efforts the Southern California ERC continues to fulfill its mission of protecting and improving worker health through education, research, and service.

CENTER OVERVIEW

Composition of the Center - The Region IX NIOSH ERC for Southern California is directed by Dr. William Hinds of UCLA. The Associate Director is Dr. Dean Baker of UC Irvine. The Center is composed of four core academic programs, five correlated programs, and Center Administration. The core programs are one each in industrial hygiene and occupational health nursing and two in occupational medicine. The correlated programs are Continuing Education that cuts across the four core programs, Hazardous Substances Training, Hazardous Substances Academic Training Program, Pilot Project Research Training Program, and NORA Research Support Program that also involves the four core programs. Seven of these programs, those listed below, are included in this Final Progress Report.

Programs - The Center's programs, included in this Final Progress Report, their directors and the degrees offered are:

<u>Institution</u>	<u>Program</u>	<u>Program Director</u>	<u>Degree(s) Offered</u>
UCLA	Industrial Hygiene	Dr. William Hinds	MPH/MS/PhD
UCLA	Occupational and Env. Health Nursing	Dr. Wendie Robbins	MS
UCI	Occupational Medicine	Dr. Dean Baker	MS/certificate
UCLA	Occupational Medicine	Dr. Philip Harber	MPH/certificate
UCLA	Center Administration	Dr. William Hinds	-
UCLA	Continuing Education/Outreach	Ms. Claudia Molina	-
UCI	NORA Research Support	Dr. Dean Baker	-

Center Goals and Objectives - The goals of our Southern California Region IX Educational Resource (ERC) Center are:

1. To educate professionals in the disciplines of occupational and environmental medicine, industrial hygiene and occupational health nursing. We believe the biggest impact our ERC can have is to attract and train bright, energetic leaders in the primary occupational health fields.
2. To provide continuing education for professionals in the field or other person with responsibilities in the occupational safety and health area. We believe that it is extremely important to provide stimulation, updates of information, promotion of interdisciplinary activities and training of professionals and non professionals on occupational health and safety issues.
3. To proliferate occupational safety and health activities through outreach to other educational institutions, other parts of universities and to organizations in a position to influence positively the occupational safety and health area.
4. To provide a focus for research activities in occupational safety and health. The results of this research can be disseminated to organizations and agencies in a position to implement preventive action.

5. To be an occupational safety and health resource to organizations (such as companies and unions) and agencies that need the expertise on occupational safety and health that our ERC possesses.
6. To act as a focus to marshal all types of community resources in occupational safety and health to identify and solve problems in the work setting and environment.
7. To respond to the changing nature of occupational health and safety problems and to develop educational programs to deal with emerging problems and issues.

Trainees

Our trainees are well qualified academically with high potential for professional and research leadership in the occupational health field. We have increased the number of trainees in all categories and currently have 49 students in our four core academic programs. Thirty-six students are ERC supported trainees and 20 of these (56%) are minority students as defined by the EEOC.

Center Environment

Southern California has many petroleum refineries, aerospace industries, service industries, and a large manufacturing base of small and medium-sized companies that represents more than 60% of the manufacturing in California. The workforce is very diverse with many immigrant and non-English-speaking groups. This large concentration of industries in Southern California provides an ideal environment for occupational health education and many opportunities for field trips and internships.

Interdisciplinary Interaction - We are proud of the interdisciplinary activities of our center. The move of center administration, continuing education, and UCLA/USC Occupational Medicine Residency to UCLA means that all programs, except the occupational medicine and NORA Research Support programs at UCI, are at UCLA. Having only two campuses involved, instead of our previous three, facilitates interdisciplinary interaction. The Director and Associate Director come from different disciplines (Dr. Hinds in industrial hygiene and Dr. Baker in occupational medicine). The UCLA occupational medicine residents take their MPH course work at UCLA School of Public Health with industrial hygiene and occupational health nursing students. Many of the courses at UCLA have multi-disciplinary focus. As shown in the ERC Course Matrix in the Center Administration section, 14 courses are required for at least two disciplines and four courses are required for all three disciplines in our ERC. While this is important, what is more important is that the trainees in our Center are taking courses, making field trips, solving problems, and writing reports with trainees in other disciplines.

Each year during the reporting period a dinner meeting and an all day field trip and interdisciplinary workshop are held at a local industry. In 99-00 it was held at LASCO Bathware, Inc., the country's largest manufacturer for fiberglass shower enclosures; in 00-01 at the Taylor Maintenance Yard of the Union Pacific Railroad; in 01-02 at the MTA Regional Rebuild Center, the central repair and rebuilding facility for all MTA buses in Los Angeles area; in 02-30 at LASCO Bathware again and in 03-04 at the Exide secondary lead smelter. Students tour the facility and then divide into four teams with each team missing one of the core academic disciplines. The teams discuss and develop what the role of the missing

discipline should be; critique the plant in that area; and present their critique to whole group. This activity requires students to work on a problem as an interdisciplinary team and to think seriously about the roles of disciplines other than their own. Both the interdisciplinary dinner meeting and the interdisciplinary plant visit and workshop are required for all ERC students and faculty. Non-supported students in ERC Programs are encouraged to attend and participate in these activities.

The new Occupational Diseases course EHS 251 is interdisciplinary with students from OM, IH, and OEHN participating. All academic programs include some courses where students from all program areas are together. Seminars on occupational health topics are given by each of the core programs and students from all program areas are encouraged to attend.

Nursing 439C and 439D Advanced Practice Nursing, required courses for OEHN trainees, now includes an optional rotation for one or two OEHN trainees to participate in the OH clinic and case conference one day/week at UC Irvine. One student elected this rotation in 2002-03.

EHS 259A Occupational Safety and Ergonomics is a required course for all IH, OEHN, and OM/UCLA students. It includes a final project where students from each of the disciplines work together as teams to solve problems and prepare a report.

An occupational nurse supervises the CalOSHA internship and residency rotation where nursing, medicine, industrial hygiene, and safety students and professionals address real problems as a team. We believe our trainees finish our programs with excellent appreciation for the roles and contributions of all the disciplines in occupational health and safety and the value of working with other disciplines.

In April of 1996, an NIEHS Environmental Health Sciences Center was established in Southern California. Dr. John Peters is the Center Director and Dr. John Froines at UCLA is Associate Director. In 1999, an EPA Particulate Matter Center was established in Southern California with Dr. Froines as the Director. In 2002 the interdisciplinary Center for Environmental Genomics (CEG) was established at UCLA. The Center is led by COEH and Department of Environmental Health Sciences faculty including Robert Schiestl (Director of CEG), Michael Collins, John Froines, and Beate Ritz (joint appointment in EHS). These Centers deepen and broaden the interdisciplinary opportunities for ERC trainees and faculty and serve as the basis for many new activities in environmental health research and training.

The ERC also has close ties to the **UCLA Labor Occupational Health Program (LOSH)** with its close connection to organized labor in Southern California. The UCLA-Labor Occupational Safety and Health (LOSH) Program is a nationally recognized center in Southern California for worker health and safety training, educational materials development, technical assistance and policy information in the area of workplace health and safety. It is part of the UCLA Labor Center, and is affiliated with the UCLA Center for Occupational and Environmental Health (COEH). The Southern California ERC has collaborated with UCLA LOSH for several years. This collaboration includes, joint CE course presentation, consultation and evaluation projects, LOSH trainer teaching in our HAZWOPER course, IH students taking the LOSH HAZWOPER course, and IH student internship opportunities at LOSH. The ERC assisted LOSH in putting on "Voices for Healthy Environment, Healthy

Communities, Healthy Jobs," a town hall meeting in Inglewood, CA. The Director of LOSH, Marianne Brown, is a supporting faculty member for the IH Program and a member of our CE advisory committee.

New Emphases of the Center - The complexion of the field of occupational health and safety is continually changing with the growing recognition of new occupational health and safety problems, such as repetitive trauma, changes in gender and age distribution, managed care, influence of psychosocial factors, response to disability, emergence of on-the-job sexual harassment, violence in the workplace, homeland security and disaster response, and the expansion of occupational health and safety to include more environmental issues. These emerging problems require changes and expansion of educational programs to provide comprehensive professional education and continuing education. Our Center is responding to these developments by modifying curricula, by providing hazardous substances training to industrial hygiene students and workers, by developing a new course in psychosocial aspects of occupational health, and by adding seminars, workshops, and continuing education activities to address the emerging issues mentioned above.

The changing organization of work in the United States has the potential to create significant psychosocial stress in the work environment that can lead to cardiovascular disease, hypertension, musculoskeletal disorders and psychological problems. In response to these changes we are developing a new ERC-wide program on psychosocial stress in the work environment. The program includes three elements. (1) The development of educational materials and presenting three lectures on this topic in the required curriculum of the IH, OEHN, and OM programs. (2) Giving three elective courses for ERC students (Work and Health (CHS 278), an introductory course of the psychosocial aspects of the work environment; Psychosocial Intervention in the Workplace; and Occupational Cardiology). (3) Providing field practicum experiences for interested ERC students involving workplace psychosocial surveillance to identify psychosocial exposures and the need for intervention. Some of the lectures have been developed and given to IH, OEHN, and OM students. Two of the three courses have been given at least once and the practicum is in operation. We are also developing research effort in this field. We have a surveillance project underway at the DaimlerChrysler Los Angeles Parts Distribution Center funded by the DaimlerChrysler/UAW. ERC student participation is included in the project.

Recent Center Enhancements - Several major changes to the structure of our center have recently been implemented. These changes have improved our overall strength and our interdisciplinary interactions.

The Center administration moved from USC to UCLA on July 1, 2000. Dr. William Hinds, formerly Associate Director, took over as Director from Dr. John Peters at that time. Dr. Dean Baker of UC Irvine and Director of the UC Irvine Occupational Medicine Program became Associate Director at that time. Dr. Hinds continues as Director of the Industrial Hygiene Program and the Hazardous Substances Academic Training Program.

The former UCLA/USC occupational medicine residency program is now administratively housed at UCLA. Dr. Philip Harber became Director of this program on July 1, 2000. The Residents will continue to get MPH degrees at the UCLA School of Public Health during their

first year, but the second or practicum year has been enhanced through the efforts of the Dr. Harber.

The continuing education program moved to UCLA in December of 1999. Space for the program was made available by the UCLA Center for Occupational and Environmental Health (COEH). Funds to facilitate the start-up at UCLA and to expand the program have also been provided by the COEH.

Our Pilot Project Research Training Program is in its sixth year. Five pilot projects were funded in the 1999-2000 cycle, four projects in the 2000-01 cycle, three projects in the 2001-02 cycle, three have been funding in the 2002-03 cycle, and four in the 2003-04 cycle

Our Pilot Project Research Training Program, Hazardous Substances Training (HST), and Hazardous Substances Academic Training (HSAT) Programs have been approved for funding for three years (2002-2005) and as such are not included in this Final Progress Report.

A new program for NORA Research Support was started in 2002 with Dr. Dean Baker of UC Irvine as Program Director. A major focus of this program is the support of interdisciplinary research training programs within our ERC. Two such programs have been approved.

A search for a tenure-track faculty member in the Occupational Medicine Program at UCLA is underway. This is another example of institutional support for our ERC programs.

These changes have enhanced our programs and added new and important strengths to our Center that put us in a position to have an even greater impact on occupational safety and health in Region IX.

Advisory Committee - We have selected a distinguished and experienced set of advisors to assist us on a continuing basis. During the reporting period the committee consists of ten members representing each of the core disciplines of our ERC plus labor and continuing education. The advisory committee members during the reporting period were:

Name	Committee Status	Discipline	Organization
Annette B. Haag, MS, RN, COHN	Chair	Occ. Health Nursing	Consultant
Glenn Azevedo, MS, CSP	Member	Ergonomics, Safety	Steelcase, Inc.
Lawrence R. Birkner, MA, MBA, CIH, CSP	Member	Industrial Hygiene.	Consultant
Thomas S. Butler, Jr., CSP, CHMM	Member	Safety	Water District
Marjorie Drucker, MS, CIH, CSP	Member	Industrial Hygiene	Consulting Co.
John Howard, MD, MPH, JD	Member	Occ./ Env. Medicine	CalOSHA/NIOSH (On leave - Director of NIOSH)
Mary Kochie, RN	Member	Occ. Health Nursing	CalOSHA
Ruth K. McIntyre-Birkner, MBA	Member	CE/O	Consultant
Cheryl Stansberry	Member	CE/Labor	Ventura County
Peter Wald, MD, MPH, FACP, FACMT, FACOEM	Member	Occ. Medicine	Consultant
Richard M. Warner, MS, CIH, CSP	Member	CE/Ind. Hyg/ Safety	Consultant

The committee is charged with reviewing the educational programs and activities of the Center and advising on modifications that would enhance the impact of the Center in achieving its goals and objectives in Region IX. Annette Haag has replaced Peter Wald as Chair of the committee. The committee is convened at least once a year.

Administrative Procedures - Five persons constitute our executive committee. They are the four academic program directors plus the director of continuing education and outreach. The executive committee meets regularly. General problems are considered at each meeting. Usually one program is reviewed in depth at each meeting so that the executive committee will have the opportunity of examining each Center component. Interdisciplinary activities are planned. Members of the external advisory committee are consulted and/or invited to the executive committee meetings as needed. The pilot project program is discussed at nearly every meeting. Outreach activities are discussed and planned rather than being left to individual initiative. The continuing education activities are reviewed for currency and relevance and emerging problems are considered for incorporating into new or revised courses. Community views have been sought to guide the ERC toward new or improved educational programs for both professional training and continuing education.

UCLA Industrial Hygiene Program

Abstract

The UCLA Industrial Hygiene Program (IHP) is a research-based program designed to train practitioners and researchers at a high professional level. The program has a strong emphasis on the basic science of the workplace environment as well as epidemiology, toxicology, ergonomics, and control technology. The IHP is an established program with an average student population of about 20. There are four full-time core faculty members associated with the program. Curriculum and research training activities have evolved into a comprehensive and effective program. The Program is ABET accredited until September 2006. The Industrial Hygiene Program represents one component of the UCLA Center for Occupational and Environmental Health (COEH), a comprehensive research and training center established by the California legislature.

Significant Findings

Academic Training

- The UCLA Industrial Hygiene Program is a well-established program with a stable student enrollment and core faculty.
- Curriculum and research training activities have evolved into a comprehensive and effective program.
- The Program is ABET accredited until September 2006.
- The Program has a good track record for training and graduates and an active research program.

Research Training

- Found that a simplified mannequin can be used instead of a full-sized mannequin for wind tunnel evaluation of personal inhalable sampler performance for aerodynamic diameter less than 80 μm and wind velocity from 0.4 to 1.6 m/s.
- Developed a new way to predict the transition from particle motion to cloud motion based on predicted cloud settling velocity for dense aerosols.
- Found 0 to 0.5% of simulated anthrax particles, 1- μm spheres, are released when a particle laden disposable respirator is dropped three feet onto a hard surface.
- Found that the concentration of ultrafine particles increased 20-fold next to freeways compared to upwind concentration, and the concentration decays rapidly with downwind distance from a freeway reaching upwind levels at approximately 300 m.
- Found that gasoline and diesel dominated freeways have similar ultrafine particle concentrations and particle size distributions next to the freeways.
- Found that the concentrations of the smallest ultrafine particles (6-20 nm) next to freeways are several fold greater in winter than summer.

- Found the Indoor and outdoor concentration ratio of ultra fine particles in residences near a freeway ranged from 0.1 to 0.4 for the smallest ultrafine particles (6-20 nm) to 0.6 to 0.9 for 70-100 nm particles.
- Developed a high performance liquid chromatographic method for detection of formaldehyde DNA adducts in nasal cell tissue cultures.
- Developed a method to concentrate aldehydes and ketones from contaminated water and air samples. Method was successfully applied to mixtures that simulated ozonolysis byproducts.
- Developed a direct reading method based on reflectance Fourier transform infrared for quantitation of the pesticide Captan.
- Measured threshold breakthrough coverage of 250 ng/cm² to be detected for nitrile gloves for Captan.
- Published a study of the anthropometric characteristics of 110 female maquiladora workers.
- Profiled the prevalence of musculoskeletal discomfort of upper extremities of engineers in an aerospace and defense engineering firm.
- Developed an Internet-based exposure surveillance tool for monitoring work demands of finger and hand involved in VDT work.
- Characterized the ergonomic impact when glove box gloves are used with different hand tools.
- Characterized VDT keyboard and mouse usage by male and female engineers.
- Doctoral research activities during the reporting period include a study of the ergonomics of glove wearing; an experimental study of the inhalability and sampling of large particles; a laboratory study of the permeation of malathion formulations through glove materials; an experimental and field study of exposure to chrome-VI among spray painters; a development study of a passive sampler for aldehydes; an intervention study of computer terminal users; a laboratory study of permeation of Captan formulations through gloves; a laboratory and field study of pesticide exposure of agricultural workers and their families in Mexico; and a study of ultrafine particles from welding in the occupational environment.

Program Report

Major Accomplishments and Changes

Academic Training

The primary academic objective of the UCLA Industrial Hygiene Program is the training of professional industrial hygienists at the MPH and MS level and advanced training of researchers at the PhD level. Other objectives include conducting research to extend knowledge in the areas of anticipation, recognition, evaluation and control of environmental hazards in the workplace; to collaborate and support other research in the general area of occupational health; and to provide service to the local, state and national occupational health communities in support of the broad objective of improving worker health and safety.

Current core faculty members are William Hinds, John Froines, Nola Kennedy, and Shane Que Hee. William Hinds is IH Program Director and Professor in the Department of Environmental Health Sciences. His teaching includes full responsibility for courses in Industrial Ventilation and Control Technology and Aerosol Technology. John Froines is a Professor in the Department of Environmental Health Sciences. His teaching includes full responsibility for Risk Assessment and Standard Setting. Shane Que Hee is a Professor in the Department of Environmental Health Sciences. His teaching includes full responsibility for Instrumental Methods in Environmental Sciences, Biological Monitoring, Properties and Measurements of Gases and Vapors, and Identification and Analysis of Hazardous Waste.

During the reporting period Nola Kennedy was hired as Adjunct Assistant Professor in the Department of Environmental Health Sciences and a core faculty member in the IH Program. Her teaching includes full responsibility for Physical Agents, Physical Agents Laboratory, and IH Practice. Also core faculty member Victor Liu left to take a faculty position at California State University Northridge. He continues as a part-time Adjunct Assistant Professor in the Department of Environmental Health Sciences and a supporting faculty member in the IH Program. He has full teaching responsibility for EHS 259A Occupational Safety and Ergonomics.

Industrial Hygiene core faculty members are researchers in different fields (Hinds - Aerosol Science and Control Technology; Froines - Risk Assessment and Toxicology; Que Hee - Environmental and Industrial Hygiene Analytical Chemistry, Hazardous Substances, and Biological Monitoring; Kennedy - Exposure Assessment) that complement each other to give the program both breadth and depth. Additional breadth is provided by supporting faculty members. These include researchers in Occupational Medicine, Occupational Safety, Ergonomics, Reproductive Toxicology, Occupational Health Education, and Occupational Epidemiology.

The IH Program is accredited by ABET/ASAC, Accreditation Board for Engineering and Technology/Applied Science Accreditation Commission, the accrediting board for industrial hygiene programs. The program is one of about 40 programs in the US accredited by ABET/ASAC. Current accreditation runs through 9/06.

The Program has acquired Validyne pressure measuring system MC-107L, a Portacount Plus and N95 Companion respirator fit testing system, a Mettler Toledo AB 104-S balance, and a Cahn C-35 microbalance.

Twenty-seven industrial hygiene students were placed in IH internship positions during the reporting period.

The program has had a NIOSH Hazardous Substances Academic Training (HSAT) grant since July 1994. This was renewed for three more years starting in July 2002. The hazardous substances training is provided as a minor concentration for our IH students. Four courses have been modified or enlarged to include coverage of hazardous substances. Students take two additional courses in addition to the IH curriculum to fulfill the minor. Sixteen students have been supported by the HSAT training grant since 1999. Twenty-five IH students have taken the 40-hour or 8-hour HAZWOPER training courses as part of this program, including

14 supported by the HSAT grant. A competitive renewal grant application for 2005-09 for the HSAT program was submitted July 1, 2004.

In the past four years 30 IH students have attended the American Industrial Hygiene Conference and Exhibition (AIHCE), the national meeting of the AIHA and the ACGIH. These students presented 15 research papers. The IH faculty presented 11 papers at these conferences.

The RAE Systems instrument company donated 15 new industrial hygiene sampling and monitoring instruments to our Program. We also received a donation of surplus equipment from The State Compensation Insurance Fund.

We continue to provide the one-year course work program for UCLA Occupational Medicine Residents as part of their training program. The curriculum includes eight courses given by the EHS Department, including three IH courses, EHS 254, 257, and 259A.

IH students have continued the Industrial Hygiene Student Association (IHSA) with elected officers and formal recognition by the UCLA campus. The Association represents the industrial hygiene students for various School and Program issues. The IHSA has been formally recognized as a Local Student Section Affiliate by the national AIHA. In conjunction with IHSA we have continued the series of informal Industrial Hygiene Student-Faculty meetings for outside seminar speakers and student opinion on curricula and other issues.

A new inter-departmental program in molecular toxicology has been established jointly by the Departments of Environmental Health Sciences and Pharmacology. The program features the application of genomic and proteomic technology to toxicology, reactive oxygen species, genetic susceptibility, metal toxicity, and air pollution. Specialized courses and research opportunities in this program are open to IH doctoral students.

The Low Velocity Wind Tunnel Facility established under the direction of Dr. Hinds conducts research on the inhalability of large particles, 10-200 μm , and the performance of samplers for particles of this size under low air velocity conditions, 0.1-7 m/s (.2 to 14 mph), covering the range of typical indoor and outdoor industrial exposures.

We have established ongoing internship opportunities with CalOSHA and UCLA Campus Environment, Health, and Safety. One or two industrial hygiene students participated in each internship each year since 1996. The IH Program provides financial assistance for students doing unpaid internships

- Honors and Awards

Four IH students received the Outstanding Graduate Student Award from the Southern California and Orange County Sections of the American Industrial Hygiene Association in 2000, 2001, 2002, 2003, and 2004, Gerald Pineda, Peng-Cheng Sung, Guadalupe Chapa, Robert Phalen, and Cody Livingston. Guadalupe Chapa received the Dean's Special Award and Yifang Zhu received the Tibbetts award from the School of Public Health in 2002. First Year IH student Alev Brown received the Tony Norton Award in 2002. In 2000 second-year IH student Chris Shin received an AIHF fellowship of \$6000, one of four awarded in the United States. He also received the Delta Omega Awards from the UCLA School of Public

Health. IH student Weiguang Zhong and Dr. Que Hee authored a poster on DNA adduct of Formaldehyde that was presented at the AIHCE in New Orleans, LA and won the award for best student poster. Cody Livingston also received the Delta Omega Society award. Robert Phalen received the Dean's Outstanding Student award.

Curriculum Changes

Since the last review, we have introduced seven **new or modified required courses** for the IH curriculum. All have been given at least once. They are described below:

Industrial Hygiene Practice, EHS 250D (2 units), a new course, covers a variety of topics not included in our regular courses. These include, professional liability, incident command system, risk and hazard communication, toxic mold, IH program auditing, IH role in response to terrorism, human genome and occupational exposures, and psychosocial aspects of work. Approximately half of the course is directed to IH program management topics.

Occupational Diseases, Recognition and Prevention, EHS 251A and 251B (1 units each), both new courses, is given in the Winter and Spring Quarters of the first year of the IH curriculum. It covers the full range of occupational diseases and includes IH, OH nursing and occupational medicine students.

The Physical Agents class EHS 253A (2 units) covers noise, ionizing and non-ionizing radiation, and heat stress. It is a required course for IH students and is one of two required menu courses for OH nurses. The laboratory section 253B is a separate course required only of the IH students.

EHS 253B Physical Agents Laboratory (2 units) is a new course providing hands-on measurement and illustration of control methods for noise, ionizing and non-ionizing radiation, and heat stress. It is required for all IH students.

EHS 254 Health Hazards of Industrial Processes (4 units) is a capstone course involving a plant visit each week. To foster interdisciplinary interaction we now require two of the six plant visit reports to be team reports involving a collaborative effort of IH, OHN, and OM students.

EHS 257 Risk Assessment and Standard Setting (4 units) is a new course on risk assessment with emphasis on the scientific basis for occupational health standards. It uses extensive case studies. It is required for all IH and OM students.

EHS 259A Occupational Safety and Ergonomics (4 units) is newly structured course that addresses the design and modification of products and industrial manufacturing processes to control hazards arising from mechanical, electrical, thermal, chemical, and other potential energy sources and ergonomic risk factors. It includes case studies in industrial manufacturing, construction, and agriculture. It also is a required course for OH nurses.

Research Training (Doctoral Level) (Progress Report Summary)

The focus of our research training program is the training of expert researchers at the PhD level. Primary research areas are occupational toxicology, occupational health surveillance,

aerosol technology, exposure assessment, industrial hygiene control technology, respiratory protection, industrial hygiene analytical chemistry, biological monitoring, ergonomics, and hazardous waste research. Funding for the research training program is used to support students and student research conducted under the supervision of an industrial hygiene faculty member.

We plan to continue to develop the specialized research laboratories. These includes the Inhalable Particle Test Facility, which has capabilities to measure inhalability with a mannequin in the 10 to 150 μm particle size range, and measure the performance of personal samplers under simulated industrial conditions. The facility has been upgraded so that it can evaluate samplers with wind velocity up to 14 mph. The Director of this facility is Dr. Hinds. The mass spectrometer facility in the Department of Environmental Health Sciences has a GC/MSD and a LC/MS. The facility has recently acquired a state-of-the-art ICP-MS. Dr. Que Hee is the director of this facility. It provides an opportunity for research students to use state of the art equipment for the analysis of workplace environmental contaminants and toxic waste contamination.

Enrollment

The program encourages the enrollment of engineers and people from industry and government. During the 1999-2004 academic years, an average of 20.4 students was enrolled in the Industrial Hygiene Program each year. Of these an average of 12.2 per year was supported by the ERC, 8.6 by IHP, and 3.6 by HSAT.

Graduates

Twelve of our graduates have taken positions as industrial hygiene inspectors in Southern California offices of CalOSHA, including four who are now District Managers. Twenty-four out of the 27 graduates of our program from 9/98 to 9/02 are working in the field of IH (21) or Environmental Health (1) or pursuing advanced degrees in related fields (2).

The placement of graduates breaks down as follows: three placed with CalOSHA, nine with private industry, three with consulting companies, three went on to graduate school, five with local health departments or other government agencies (including two in the military and two in state universities), and three in research or education positions.

Conclusions

The UCLA Industrial Hygiene Program is a well-established program with a stable student enrollment and core faculty. Curriculum and research training activities have evolved into a comprehensive and effective program. The Program has a good track record of training and graduates and an active research program. This record and the accomplishments outlined above auger well for continued excellent performance.

Publications

Publications by core faculty and trainees are given in the final section of this progress report.

Occupational and Environmental Health Nursing Program

Abstract

The purpose of the Occupational and Environmental Health Nursing Program is to provide graduate education for nurses in order to prepare them for specialty nursing practice as part of interdisciplinary occupational health and safety teams in increasingly complex and diverse occupational and environmental health settings. The goal of the program is to respond to the national and regional need for qualified nursing specialists, researchers, managers and leaders in occupational health and safety. The occupational and environmental health nursing specialty is a two-year program of study earning a Masters degree in Nursing (M.S.N.). The training is multidisciplinary and includes courses and content in industrial hygiene, safety, ergonomics, psychosocial factors in workplace health, research, epidemiology, toxicology, and occupational medicine. Students choose a concentration in either nursing administration of occupational health programs (minimum of 69 units) or advanced practice adult nurse practitioner (minimum of 85 units). Graduates of the nurse practitioner concentration are certified to practice as Adult Nurse Practitioners in the state of California and are eligible to sit for national Adult Nurse Practitioner (A.N.P.) certifying boards. The UCLA School of Nursing degree programs have been approved by the California Board of Registered Nursing and the University Academic Senate (Western Association of Schools and Colleges), and are accredited by the National League for Nursing (NLN) and the Commission on Collegiate Nursing Education (CCNE). All graduates of the program have a foundation for future doctoral study. The Occupational and Environmental Health Nursing program is part of the UCLA Center for Occupational and Environmental Health, a comprehensive research and training program established by the California legislature. The Center provides support for faculty and administration that complements ERC funding. The latter is used primarily to support students. This combination represents a unique and effective partnership between state and federal funding.

Significant Findings

- The program moved from being a subspecialty of the Family Nurse Practitioner Program to being its own independent specialty.
- Consistent with the AAOHN's 1998 adoption of the concept of environmental health as a component of OHN practice and the 1995 IOM recommendation to integrate nursing, health, and the environment, the term 'environmental' was incorporated into the name of the program, now titled 'Occupational and Environmental Health Nursing'.
- An option in OEHN Nursing Administration was added and has graduated 9 students during the period 7/1/99 through 6/30/03.
- Professional role and theory courses in OEHN went online to complement the option of earning an M.S.N. online in Nursing Administration. Now all coursework for a Masters degree in OEHN-Admin can be obtained online from UCLA except the I.H., safety and ergonomics content.

- Nurse practitioner training changed from Family Nurse Practitioner to Adult Nurse Practitioner and 12 OEHN students have graduated as ANP since the change. Prior to this change ~38% of students elected to practice in OH&S. In the years post the change, 62 to 80% of the students elected to practice directly in OH&S.
- Six students were chosen and completed Federal OSHA traineeships in Washington D.C.

Program Report

Major Accomplishments and Changes

Academic Training:

- Faculty changes included the loss of Dawn Stone, MS, COEHN-S. Her position was filled by Carol Murdock, MSN, ANP, COHN-S. Ms. Murdock brought over 20 years experience as an OHN in the Southern California area to the program. After one year, she reduced her percent effort to 5% in order to gain more nurse practitioner practice. She still contributes a vital part of the program. Mr. Lamusao, OEHN-ANP, a graduate of our UCLA program, then took over as Clinical Instructor.
- The program of study credit loads per quarter were adjusted as some duplicate content was eliminated and courses combined. N213A Occupational Health Nursing Role and Theory is now 4 units, N213B Health Assessment, Research, and Health Promotion in Occupational Health is 3 units. The placement of these core nursing theory courses were scheduled in a way that equalizes credits across quarters, prevents conflicts for trainees regarding School of Public Health courses, and insures that nursing trainees are sitting in an occupational health course every quarter.
- Content in cultural competence and care for special risk worker populations was increased. Selected examples include obtaining a \$300 grant from the UCLA Office of Instructional Design to host a panel of migrant farmworkers who spoke about workplace health concerns, offering yearly medical Spanish language classes through the School of Nursing, combining selected OEHN course offerings with the Vulnerable Populations Research Center colloquia in the School of Nursing.

Research Training:

There are no doctoral level students, however, research training and productivity of OEHN masters level students has increased. All second year students are required to write a research proposal or conduct and evaluate a health promotion project targeted to a NORA priority area. A number of excellent proposals have resulted but the following are showcased as evidence: 'Evaluation of PDAs for Use in Safety Audits' was subsequently funded by AAOHN Foundation, 'A Study of Demographic Characteristics and Changing BMI Score in a Cohort of Boeing Satellite Systems Employees' was selected for platform presentation at the 2003 Annual School of Nursing Research Day, 'Can Food Allergy Screening Be Used to Predict Latex Allergy in Health care Workers?' selected for poster presentation at 1999 Annual School of Nursing Research Day, and 'Hearing Protection for Healthcare Workers on the Heliprot' was officially adopted by the UCLA Medical Center.

Enrollment

A total of 26 students successfully graduated from the program over the previous funding cycle out of 28 admitted to the program. One student failed to pass the comprehensive exam and one student dropped the specialty area due to competing interest in health services.

Graduates

The placement of graduates is as follows: one in federal employee health office, eight in private industry occupational health, five in hospital employee health, two applied to doctoral programs, two took teaching positions in occupational health, four were placed in free standing clinics that contract employee health services, and placement for two are not known and two have left the work force temporarily to start families.

Conclusion

The program has made steady progress toward its goal to respond to the national and regional need for qualified occupational and environmental health nursing specialists, managers, researchers, and leaders in occupational health and safety. It has sustained positive growth in size and reputation and has met objectives to prepare nurses for specialty practice as part of interdisciplinary occupational health and safety teams and to prepare them for research, management, and leadership roles in increasingly diverse occupational and environmental health settings.

Publications

Publications by core faculty and trainees are given in the final section of this progress report.

Occupational Medicine Program, UC Irvine

Abstract

The UCI Occupational Medicine Residency Program was established in 1976 and has trained over 55 physicians. The program graduates include a core of the occupational medicine specialists in the Southern California region, as well as leaders in corporate occupational medicine and public health practice. The program's purpose is to prepare physicians for the comprehensive practice of occupational medicine in a variety of settings, including clinical practices, corporate medical departments, and public health programs. The program provides a range of training opportunities so residents can tailor their training to address their educational objectives, while ensuring that each resident receives training in the core areas.

Residents in the academic phase enroll in a Master of Science degree program in toxicology or environmental health science and policy at UCI. During their degree programs, residents complete the MPH-equivalent course requirements for board certification. During the practicum phase, residents spend much of their time in field site rotations in settings which reflect the broad range of practice opportunities. The residency provides practicum training in industrial and service sector occupational medicine programs, as well as in comprehensive occupational medical practices and in regulatory agencies. Within the rotations, the residents are exposed to all aspects of occupational medicine practice. Throughout the academic and practicum phases, the residents receive ongoing training at the UCI Center for Occupational and Environmental Health (COEH) consisting of clinic sessions, clinical case conference, didactic seminars, journal club, and work site visits. Residents must complete a research project during the residency.

The program trained an average of four residents per year during the reporting period; graduating 11 residents. The residency was able to fill all of the positions we offered, which is determined primarily by the availability of resident stipend support. All of our graduates have obtained desirable positions in occupational medicine practices or academics. All except one graduate passed the occupational medicine board certifying examination on the first attempt.

The occupational medicine program faculty also provided occupational medicine training to medical students and primary care residents at UCI. The program offered a monthly continuing education course for practicing physicians and nurses in the region, and the faculty developed and actively participated in the ERC outreach and continuing education programs.

During the reporting period, the core faculty substantially expanded with the recruitment of three more occupational medicine specialists. The program opened a second occupational health clinic based at the UCI Medical Center, which served as a core clinical training site. In 2002, the program moved into an 11,000 square foot suite in brand new building that was designed specifically for our clinical and academic programs, providing outstanding training facilities. At the same time, the program enhanced its core training in industrial hygiene and safety by expanding core courses in these areas; increased opportunities for interdisciplinary interactions by adding new interdisciplinary rotations and field training experiences; and implemented a training initiative in work organization and psychosocial stress. In summary,

the program continued to grow and all aspects of the program were enhanced during the reporting period.

Program Report

A. Significance

The UCI occupational medicine program continued to make a significant contribution to the Southern California Education and Research Center (ERC) during the reporting period. The supply of trained occupational medicine specialists is inadequate in Southern California. Orange County with total population of 3 million and an employed population of more than 1.3 million persons has only 21 board-certified occupational medicine physicians, of whom 10 graduated from our program or are on the faculty. The UCI program has also trained half of the board certified occupational medicine specialists in San Diego County and a substantial proportion of the occupational medicine specialists in Los Angeles County, as well as some in Northern California and Hawaii. Therefore, the UCI program has made a significant contribution to the regional supply of board certified occupational medicine specialists.

The UCI occupational medicine program has significantly enhanced the Southern California ERC by augmenting the ERC's capacity to function as a regional resource for education and research in occupational safety and health. The program's location in Orange County is an important asset because the program extends the ERC to serve Orange County and San Diego County, which have no other occupational medicine training programs. Several of the residents came from and now practice in San Diego County. The ERC has had a much greater regional impact because of the participation of the UCI occupational medicine program.

B. Accomplishments

Summary of Accomplishments. The program's objectives, structure, and curriculum were maintained, with substantial enhancements because of growth in the faculty, new outstanding clinical and academic training facilities, new training initiatives in workplace psychosocial stressors and workplace preparedness, and enhanced opportunities for interdisciplinary interaction. The program maintained full ACGME accreditation and graduated 11 specialists in occupational medicine, all of whom currently practice in the field of occupational medicine.

Accreditation. The residency program maintained full accreditation by the American Council on Graduate Medical Education (ACGME) during the reporting period. A renewal for continuing accreditation was submitted and the program was site visited during Spring 2004.

Faculty. The core program faculty expanded during the reporting period. Dr. Dean Baker continued as the residency program director. M. Joseph Fedoruk, MD, CIH; Peter Schnell, MD, MPH; Elliott Kornhauser, MD, MPH, MBA; and Ralph Allan, MS, JD, CIH continued as core faculty. Ulrike Luderer, MD, PhD, MPH joined the faculty in 1999 to teach occupational medicine and toxicology. Helen Wong, MD, MBA, MS was on the faculty from 2001 to 2002 as a clinical occupational medicine preceptor. Leslie Israel, DO, MPH,

joined the faculty in fall 2003 to teach clinical occupational medicine and serve as the Associate Residency Program Director. Lester Sacks, MD, PhD (occupational medicine) and James Seltzer, MD (allergy and immunology) also became part-time core faculty in the program.

The voluntary clinical faculty remained a cornerstone of the training program by providing outstanding training opportunities in the affiliated field training sites, and by participating in the residency didactic seminar. There were no major changes in the voluntary faculty during the reporting period. Dr. John Howard was replaced by Dr. Larry Rose and Ms. Mary Kotchie as the preceptor for the Cal-OSHA rotation, after Dr. Howard was appointed as the NIOSH director.

Training Facilities. The program is based in the facilities of the UCI Center for Occupational and Environmental Health and the UCI Medical Center Occupational Health Clinic. The Center has excellent resources for training including an active occupational medicine clinic; offices for faculty, clinical and research staff, and trainees; conference rooms; and library with all standard occupational safety and health textbooks and periodicals as well as extensive computer and on-line search capabilities. The Center moved into a brand new building in Fall 2002, so that the current Center 11,000 sq. ft. space was specifically designed and built for the program.

During the academic phase, residents enroll in accredited master degree programs at UCI, which is a major university with excellent facilities. Field training sites available during the practicum phase include Exxon-Mobil, Steelcase, the County of Orange Employee Health Service, Cal-OSHA, Kaiser-Permanente Occupational Medicine, Sharp Rees-Stealey Medical Group, UCSD Center for Occupational and Environmental Medicine, Southern California Regional Poison Control Program, and UCI Medical Center ambulatory care clinics.

Educational Program and Curriculum. There were no major changes in the program goals and objectives during the reporting period. The structure of the curriculum has been maintained. Since the last review, the program fully implemented the core courses in industrial hygiene and occupational health law. We also initiated a new core course on occupational safety that replaced the previously required course offered through the UCI Extension Program. We developed two new rotations at UCI to facilitate interdisciplinary interactions with ERC trainees. We also developed new training initiatives in work organization and workplace psychosocial stress, and in workplace preparedness for terror and disaster.

The degree options for the academic phase were maintained through the reporting period; however, the program is not offering the MPH degree program at UCLA after the reporting period because that option is now available through the UCLA residency.

The field training rotations remained the same. The core rotations continue to be Exxon-Mobil Oil, Steelcase, Cal-OSHA, Kaiser Permanente, Sharp-Rees Stealey Medical Group, and the UCI Medical Center Occupational Health clinic – providing corporate,

regulatory/governmental, and clinical training experiences. The program also offers a number of elective rotations.

Interdisciplinary interaction was enhanced during the reporting period. Although the UCI Occupational Medicine Program is the only core program based at UCI, the Continuing Education and Outreach, Pilot Projects, and NORA Research Support programs all function across the two campuses, as does the training initiative in workplace psychosocial stressors. The ERC provides multiple opportunities for interdisciplinary interactions of the trainees.

Trainees and Graduates. The residency program trained an average of four residents per year, graduating 11 residents during the reporting period. The graduate degrees obtained by the residents during the program include: MS in toxicology – 8; MS in environmental health science and policy – 1; and MPH in environmental health sciences – 2. All of the graduates during the reporting period except one passed the occupational medicine board certification examination on the first attempt. Some of the program's recent graduates, such as Dr. Ellyn McIntosh, have begun to take regional leadership roles in occupational medicine professional associations. All of the graduates practice full time in occupational medicine in the following settings: clinical occupational medicine – 5; corporate or workplace-based – 2; government (US Navy) – 2; and academic occupational medicine – 2.

C. Publications

Publications by core faculty and trainees are given in the final section of this progress report.

OCCUPATIONAL MEDICINE, UCLA

ABSTRACT

The UCLA occupational medicine program is a new program, but it was established based upon the former program at the University of Southern California. It is now fully accredited and has implemented a two-year educational curriculum. Unique features include the two-year educational curriculum and the use of a limited number of very well-planned and integrated rotations that in aggregate provide each trainee a well balanced, comprehensive experience rather than a panoply of elective rotations. Residents and other trainees have been effective in completing meaningful research and creative projects. The program benefits from the very close association with other campus resources such as the school of public health, other academic departments, and the UCLA Medical Center.

SIGNIFICANT FINDINGS

The UCLA occupational medicine program has successfully created educational program for training physicians and others in a multidisciplinary environment. Particular strengths include the emphasis upon the multidisciplinary approaches to occupational health, a unified competency-based educational program, and integration of didactic and experiential learning.

BODY: DETAILED DESCRIPTION OF ACCOMPLISHMENTS:

Major accomplishments include the following:

Program management

Program transfer: The program has been transferred from the University of Southern California (USC) to the University of California, Los Angeles (UCLA). The program is now administratively within the Department of Family Medicine of the David Geffen School of Medicine at UCLA.

Accreditation: the residency program is fully accredited (five-year approval) by the Accreditation Council for Graduate Medical Education. When the program was based elsewhere, it had been placed on probation.

Program oversight: the UCLA occupational medicine program is under the oversight of the UCLA School of Medicine Graduate Medical Education Committee. The program has been reviewed and approved.

Program Faculty:

Program faculty consists of Dr. Philip Harber, Director, Dr. Paul Papanek, and Dr. Craig Conlon. A search is underway for an Associate Director. There are three supporting faculty members and 12 adjunct faculty members that broadly reflect the academic and professional occupational medicine community in Southern California. During the reporting period we added Dr. Ellyn McMintosh and Dr. Satwant Sidhu to our adjunct faculty. Dr. Peter Wald has left California and is no longer a faculty member.

Setting:

The program benefits from its setting: (1) Southern California provides a unique diversity of clinical opportunities, types of industry, and population diversity. (2) At UCLA, the School of Public Health and the school of medicine are physically contiguous; this fosters considerable interaction. (3) UCLA has a long tradition of actively involved faculty members with extensive involvement in service, education, and research. Both the full-time and the part-time/volunteer faculty members have actively participated in numerous activities for many years.

Both formal structural and ad hoc relationships facilitate an integrated approach with numerous educational and research resources. In addition to the CDC/NIOSH funded ERC, the occupational medicine program is a core component of the UCLA Center for Occupational and Environmental Health (a cross disciplinary, multi school effort). In addition, the site program is in the mainstream of a major department in the school of medicine.

Curriculum:

The UCLA program now has a well-designed curriculum to provide comprehensive experience for the trainees. Features include the following:

Continuum over two-year experience:

Unlike many programs, the program does not completely separate the "academic" and the "practicum" years. Rather, a continuum of experience is provided. Core topics are covered over a two-year cycle. Although much of the focus in the first year is on MPH related courses, our students participate in actual occupational medicine activities at the same time they are receiving their MPH. A research or other creative project is initiated the first year and carried on throughout the second-year. The trainees have close and regular contact with the faculty throughout the two years; at the very least, there is a common seminar every week.

Balanced and comprehensive core practicum experience:

The experiential learning is based upon carefully designed core rotations. In aggregate, they provide a comprehensive experience in occupational medicine and were designed to provide balance. Each rotation is carefully structured to optimize the learning experience; because faculty preceptors participate regularly, this allows development of high-quality learning opportunities.

There are six core rotations. They are designed to provide a balanced comprehensive experience in occupational medicine. Three involved a strong clinical focus: Academic Center provides experience in complex evaluations and toxicology; Kaiser Permanente has excellent frontline clinical practice teaching and practice; Pacific Medical provides experience in medical surveillance examinations. The three nonclinical rotations are also designed to provide comprehensive perspective: CAL OSHA gives a regulatory/government experience with considerable in-plant time; City of Los Angeles functions as a "corporate medical department"; and Long Beach Medical provides experience with program design and operation for in plant medical services. The academic center rotation also devotes significant time to the research/creative project with close interaction with the full-time faculty.

The emphasis upon the six carefully planned core rotations differs philosophically from some other programs, in which most of the practicum experience is acquired by selecting from a large number of electives. UCLA has chosen the more focused approach in order to assure that each trainee gets a comprehensive experience and that it is possible to work closely with practicum faculty supervisors. All of the faculty site preceptors are actively involved in the program and help shape the overall curriculum.

Individual educational plan

A specific individual educational plan (IEP) is implemented for each trainee based upon his/her prior experience and future goals. Although much of the program is mandatory, the program includes considerable opportunity for customization. The resident project is chosen to meet the career and learning goals of the individual; for example, some residents emphasize a clinically oriented project, others traditional epidemiologic research. In addition, elective courses are available through the school of medicine and school of public health; residents have also elective courses in the graduate school of business. The practicum rotations were adjusted depending on the residents' needs; for example, those with limited prior clinical training typically spend more time in the clinical rotations. In addition, the specific activities of the rotations are adjusted as needed. Residents also have a limited amount of elective time.

Research/creative project:

Trainees are required to conduct a meaningful research or other creative project with significant personal responsibility but working closely with faculty members. In addition to accomplishing the specific project, this is a major "learn by doing" opportunity for trainees to master project planning and management. Many have previously been clinically oriented, dealing largely with an immediate patient problem; conducting a project requires the trainee to plan and implemented activities over a longer time frame. This is particularly important for trainees in occupational preventive medicine and other preventive medicine specialties. To reach this goal, we expect the resident to carry out a meaningful personal project rather than simply be integrated in an ongoing faculty endeavor.

Residents have produced significant research and publications. Examples are publications include a case report of fatal rat bite fever in the American Journal of Industrial Medicine, analysis of carbon black epidemiology, a review of teleradiology in occupational medicine, a health services survey of occupational medicine practice patterns (in press), and epidemiologic study of dental hygienists (submitted).

Pop-Med (population-occupational-preventive medicine)

UCLA has instituted this program in recognition of the commonalities in the preventive medicine specialties. Approximately one-fourth of seminars have been jointly conducted with general preventive medicine and other groups. Under the leadership of the occupational-environmental medicine program, medical Center wide lectures dealing with these areas are conducted. The philosophy of this program is consistent with the newly stated policy of NIOSH to emphasize integrated, coordinated approaches to health protection and promotion in the workplace (i.e., the NIOSH Step program).

Continued education, outreach, and conferences:

UCLA occupational-environmental medicine is active in these areas. Many of the seminars are open to members of the professional community of Los Angeles, and many actively participate. In addition, our program has sponsored a 10 week course in occupational medicine topics (assisted by the the ERC CE program) and recently conducted a major conference in "Health, Culture, and Productivity".

In addition, faculty members are actively involved in numerous courses and programs arranged by other organizations. The program director has served in educational leadership roles in ACOEM; other program faculty members have recently been president of the Western Association and Program Chair for the major Western occupational health conference.

Professional public service:

Program faculty provides extensive regional and national service. For example, this includes service on the ACGME Preventive Medicine residency review committee, Western Occupational-Environmental Medical Association (WOEMA) presidency, Western Occupational Health Conference (program chair); CDC/NIOSH Initial Review Group (Study Section, Chair), ACOEM Board, California Medical Association (Occupational-Environmental Medicine Committee Chair) and many others.

Trainees:

Eleven physicians have participated in the main residency program, 16 in the international occupational medicine program (attending courses and conducting projects, but not doing clinical work), two in the visiting scholars program (for visiting faculty members from other institutions), and two more as residents on rotation/elective from other occupational medicine programs. In addition, the faculty members have taught courses in the school public of health and provide extensive educational opportunities for pre MD and post M.D. trainees in primary care fields.

Publications:

Publications by core faculty and trainees are given in the final section of this progress report.

CENTER ADMINISTRATION

Abstract

Center administration for the Southern California ERC is located at UCLA in the Department of Environmental Health Science in the School of Public Health. William Hinds at UCLA is Center Director and Dean Baker at UC Irvine is Deputy Director. Our Advisory Committee consists of ten members representing each of the core disciplines of our ERC plus labor and continuing education.

Our ERC is composed of four core academic programs: two in occupational medicine (OM) (one at UCLA and one at UC Irvine), one in industrial hygiene (IH) at UCLA, and one in Occupational and Environmental Health Nursing (OEHN) at UCLA. The Center also includes a continuing education/outreach (CE/O) program, Center Administration, Hazardous Substances Academic Training Program (HSAT), a Pilot Project Research Training Program (PPRT), and a Hazardous Substances Training (HST) Program and a NORA Research Support (NORARS) program.

A new program, NORA Research Support, started in July 1, 2002. The program supports two interdisciplinary research projects in the ERC that focus on one or more of the NORA areas. One was an ergonomic study of dental hygienists and the other a psychosocial assessment program for industry.

The changing organization of work in the United States has the potential to create significant psychosocial stress in the work environment that can lead to cardiovascular disease, hypertension, musculoskeletal disorders and psychological problems. In response to these changes we have undertaken an ERC-wide effort to develop courses, field practicum, and research in the area of psychosocial stresses in the workplace.

The ERC has continued its program of specific activities designed to foster interaction among disciplines. These include an annual dinner meeting and an annual plant visit with interdisciplinary workshops. Fourteen courses are required for at least two disciplines and four courses are required for all three disciplines in our ERC.

An ERC needs assessment was conducted in early 2003. Questionnaires were sent out to 4281 occupational health professionals in region IX and 424 participants completed the survey. We also conducted an outcomes competency survey of our alumni. There were 43 valid responses. The survey had 33 competencies grouped into six broad categories, recognition, evaluation, control, communications, professional conduct, and management. Respondents were asked rank each competency in terms of (1) their value in the practice of their profession and (2) their proficiency upon completing the program.

Significant Findings

- The SCERC administration has successfully moved from USC to UCLA and Dr. Hinds has taken over as Center Director.
- A Pilot Project (PPRT) and a NORA research support (NORA/RS) programs have been established in our ERC.

- An ERC center website has been established at <http://www.ph.ucla.edu/erc/>.
- An ERC-wide effort has started a new training and research program in psychosocial aspects of the work environment.
- The ERC held five interdisciplinary dinner meetings for all ERC students and faculty.
- The ERC held five interdisciplinary plant visit and workshops for all ERC students and faculty.
- The ERC conducted a comprehensive needs assessment in 2003.
- The ERC conducted an outcomes survey of alumni in 2003.

Program Report

a. Core Programs

The Southern California ERC is composed of four core academic programs: two in occupational medicine (OM), one in industrial hygiene (IH), and one in Occupational and Environmental Health Nursing (OEHN). The two occupational medicine programs, University of California, Los Angeles (UCLA) and University of California, Irvine (UCI), and the industrial hygiene program are accredited. The Center also includes a continuing education/outreach (CE/O) program.

Other programs are Center Administration, Hazardous Substances Academic Training Program (HSAT), a Pilot Project Research Training Program (PPRT), and a Hazardous Substances Training (HST) Program and a NORA Research Support (NORA/RS) program.

All core academic programs and CE/O and NORA/RS are included in this Final Progress Report.

Programs - The Region IX NIOSH ERC for Southern California is directed by Dr. William Hinds of UCLA. The Associate Director is Dr. Dean Baker of UC Irvine. The Center's programs, their directors and the degrees offered are:

<u>Institution</u>	<u>Program</u>	<u>Program Director</u>	<u>Degree(s) Offered</u>
UCLA SPH	Industrial Hygiene	Dr. William Hinds	MPH/MS/Ph D
UCLA SON	Occupational Environ. Health Nursing	Dr. Wendie Robbins	MSN
UCLA SOM	Occupational Medicine	Dr. Philip Harber	MPH/certifica te
UCI COM	Occupational Medicine	Dr. Dean Baker	MS/certificate
UCLA SPH	Center Administration	Dr. William Hinds	—
UCLA SPH	Continuing Education/Outreach	Ms. Claudia Molina	—
UCI COM	NORA Research Support	Dr. Dean Baker	—

b. Multiple Campus Locations

Center Administration moved from USC to UCLA on July 1, 2000. At that time, William Hinds took over as Center Director from John Peters of University of Southern California

(USC) and Dean Baker of UC Irvine became Deputy Director. Center Administrator is Rachel Kim. Since July 1, 2000, the Southern California ERC includes only two campuses of the University of California, UCLA and UC Irvine (UCI). The UC Irvine campus is about 60 miles south of UCLA. All programs are at UCLA except one of the two occupational medicine programs and the NORA Research Support Program, which are at UC Irvine. CE/O, NORA/RS, and PPRT programs span both campuses. Center administration is located at UCLA in the Department of Environmental Health Science in the School of Public Health. These organizational changes have enabled closer working relationships between programs and greater interdisciplinary interaction among students and faculty.

Advisory Committee - We have selected a distinguished and experienced set of advisors to assist us on a continuing basis. The committee consists of ten members representing each of the core disciplines of our ERC plus labor and continuing education. The advisory committee members during the reporting period were:

Name	Committee Status	Discipline	Organization
Annette B. Haag, MS, RN, COHN	Chair	Occ. Health Nursing	Consultant
Glenn Azevedo, MS, CSP	Member	Ergonomics, Safety	Steelcase, Inc.
Lawrence R. Birkner, MA, MBA, CIH, CSP	Member	Industrial Hygiene.	Consultant
Thomas S. Butler, Jr., CSP, CHMM	Member	Safety	Water District
Marjorie Drucker, MS, CIH, CSP	Member	Industrial Hygiene	Consulting Co.
John Howard, MD, MPH, JD	Member	Occ./ Env. Medicine	CalOSHA
(On leave - Director of NIOSH)			
Mary Kochie, RN	Member	Occ. Health Nursing	CalOSHA
Ruth K. McIntyre-Birkner, MBA	Member	CE/O	Consultant
Cheryl Stansberry	Member	CE/Labor	Ventura County
Peter Wald, MD, MPH, FACP, FACMT, FACOEM	Member	Occ. Medicine	Consultant
Richard M. Warner, MS, CIH, CSP	Member	CE/Ind. Hyg/ Safety	Consultant

The committee is charged with reviewing the educational programs and activities of the Center and advising on modifications that would enhance the impact of the Center in achieving its goals and objectives in Region IX. Annette Haag has replaced Peter Wald as Chair of the committee. The committee is convened at least once a year.

Unfortunately, long term advisory committee member, Joyce Simonowitz, died in August of 2002. She was an outstanding occupational health nurse who coordinated the UCLA and UC Irvine occupational medicine rotation at CalOSHA, facilitated interaction between CalOSHA and IH and OEHN students, and helped locate field trip sites. Our new advisory committee member Mary Kochie has replaced Joyce Simonowitz at CalOSHA. Through the efforts of our OEHN Program and the UCLA COEH the Joyce Simonowitz Prize has been established

at UCLA. The first award of the \$2000 prize went to Bonnie Schuur, a first year OEHN trainee in the spring of 2003.

Administrative Procedures - Five persons constitute our executive committee. They are the four academic program directors plus the continuing education director. The executive committee meets regularly. General problems and issues that affect all programs are considered at each meeting. Usually at each meeting, one program is reviewed in depth so that the executive committee will have the opportunity of examining each of the Center's components. Interdisciplinary activities are planned. Members of the external advisory committee are consulted and/or invited to the executive committee meetings as needed. The pilot project program is discussed at nearly every meeting. Outreach activities are discussed and planned rather than left to individual initiative. The continuing education activities are reviewed for currency and relevance and emerging problems are considered for incorporating into new or revised courses. Community views have been sought to guide the ERC toward new or improved educational programs for both professional training and continuing education.

c. New Program Developments

All the academic programs, the HST and HSAT programs, and the continuing education/outreach programs enhance their curriculum on an ongoing basis. New courses are developed and current courses are revised to reflect students' needs and developments in the various disciplines of occupational safety and health. Details for these curriculum modifications are given in the individual program progress report summaries.

The UCLA Occupational Medicine program, which had been on probation, had its accreditation reestablished during the reporting period. A four-hour workshop on psychosocial aspects of Occupational Health was held on March 6, 2002. The workshop was organized and funded by the ERC and all UCLA ERC trainees were required to attend. During the reporting period a new course, EHS 251 Occupational Diseases: Recognition and Prevention was developed. It is taught by Dr. Harber in winter and spring quarters. This course is a required course for UCLA OM, IH and OEHN students. A four-hour workshop on Management of OH programs, required for OEHN students and open to IH and OM students, and a one-day Psychosocial Symposium held at UCLA were jointly sponsored by the SCERC and the UCLA Center for Occupational and Environmental Health.

A search for a tenure-track faculty member in the Occupational Medicine Program at UCLA is underway. This is another example of institutional support for our ERC programs.

A new program is the NORA Research Support, which started in July 1, 2002. NORA research support funds were used to support two interdisciplinary research projects in the ERC that focus on one or more of the NORA areas. One was an ergonomic study of dental hygienists and the other a psychosocial assessment program for industry.

A new ERC Center website has been established at <http://www.ph.ucla.edu/erc/>. A new Center brochure has been prepared.

A New Training Program in Psychosocial Aspects of the Work Environment

The changing organization of work, currently taking place, creates significant psychosocial stress in the work environment that can lead to cardiovascular disease, hypertension, musculoskeletal disorders and psychological problems. In response to these changes we have undertaken an ERC-wide effort to develop courses, field practicum, and research in the area of psychosocial stresses in the workplace. This will support and enhance our core academic programs in this emerging field.

This proposed program has three major objectives: (1) develop specific introductory didactics tailored to ERC graduate students to be incorporated into their core curriculum. (2) provide three elective graduate courses to be taught at the UCLA SPH for ERC and SPH students. They are (a) an introductory course on Work and Health (CHS 278), (b) a course in prevention/interventions at the workplace, and (c) a clinical course on Occupational Cardiology. (3) Provide a practicum experience (directed research experience) for ERC students integrated with the requirements of the three core ERC training programs. In addition, the ERC will encourage advanced research training in this area by providing some funding support through the NORA Research Support Program.

Objective 1 – Lectures for core programs Specific didactics will be developed and taught for the ERC graduate students by Dr. Peter Schnall and Dr. Kanan Patel-Coleman. Three lectures each 3 hours in length will be presented conjointly to all students (a total of 9 hours) during the academic year. This proposed training program will develop specific educational materials and provide training on workplace psychosocial stressors for each of the three specialty training areas. The training will enable students to (a) learn about the importance of psychosocial factors affecting work-related stress, (b) learn the use of survey instruments to identify work-related stress, (c) learn to conduct surveillance of psychosocial stressors and related health outcomes in the workplace and d) gain clinical skills and knowledge about psychological, physical and cardiovascular endpoints resulting from exposure to workplace psychosocial stressors.

The proposed lectures for Industrial Hygiene students will allow them to broaden their competency in the assessment of workplace exposures to include psychosocial stressors. The specific didactics for Occupational Health Nursing students will improve their ability to conduct their core tasks including health status assessment, health promotion, illness/accident prevention, hazard control, screening surveillance, and rehabilitation of adult workers. Recent developments in cardiovascular science support the need for further training of Occupational Medicine Residents in the newly developing discipline of occupational cardiology.

Objective 2 – Elective courses Two courses related to occupational work and health have already been developed with NIOSH ERC and APA support and are offered at UCLA and UCI. These two courses are Work and Health (CHS 278) and Occupational Cardiology. CHS 278 introduces students to the basic concepts of work and psychosocial stressor and offers hands-on training in psychosocial stressor questionnaire use and measurement of blood pressure in the workplace. Occupational Cardiology was developed by Dr. Peter Schnall and Dr. Karen Belkic for the occupational medicine residents and was taught in 2001-2002 at the UCI-COEH. This clinical course offers training in the clinical implications of occupational

work stressors for cardiovascular function and will be offered to both occupational health nurses and medical residents to provide them with an opportunity to further develop their clinical skills in assessing and treating the biological and psychological endpoints of work stressors. The course in prevention/interventions at the workplace is under development.

Objective 3 – Practicum opportunities Directed research experiences for students in each of the ERC specialty areas will be provided. The training activities are designed for students to learn to conduct surveillance/research in the workplace to identify psychosocial exposures, stress related health outcomes and groups in need of intervention. The practicums will be integrated with the core research requirements of the three ERC core academic program areas. One first and one second year student from each of the three ERC training disciplines can be accommodated in this program each year.

The UCLA and UC Irvine COEHs have developed a joint initiative in the area of psychosocial stressors in the workplace called STEP. The proposed training program will draw on the resources of the STEP project, which has four components, surveillance, training, evaluation research, and prevention. ERC Graduate students will have the opportunity to participate in each phase of this program. We currently have an ongoing research project as part of the STEP project. It involves psychosocial surveillance research at the Parts and Distribution Center of Daimler-Chrysler in Los Angeles funded by the Daimler-Chrysler/UAW

d. Interdisciplinary Interaction

With the move of programs to UCLA on July 1, 2000, all ERC programs are in the University of California and all but two are on the UCLA campus. This greatly facilitates interaction among students and disciplines. The ERC has continued its program of specific activities designed to foster interaction among disciplines. These include an annual dinner meeting and an annual plant visit with interdisciplinary workshops. During 1999-04, we have had five annual interdisciplinary dinner meetings with speakers. The speakers have included Dr. Linda Rosenstock, Dean of the UCLA School of Public Health and former Director of NIOSH, John Howard, Director of CalOSHA (now Director of NIOSH), and Dr. Raymond Neutra, Chief of the Division of Environmental and Occupational Disease Control in the California Department of Health Services.

We have also held our interdisciplinary plant visit and interdisciplinary workshop every year during the reporting period. In 99-00 it was held at LASCO Bathware, Inc., the country's largest manufacturer for fiberglass shower enclosures; in 00-01 at the Taylor Maintenance Yard of the Union Pacific Railroad; in 01-02 at the MTA Regional Rebuild Center, the central repair and rebuilding facility for all MTA buses in Los Angeles area; in 02-03 at LASCO Bathware again; and in 03-04 at the Exide secondary lead smelter. Students tour the facility and then divide into four teams each missing one of the core academic disciplines. The teams discuss and develop what the role of the missing discipline should be; critique the plant in that area; and present their critique to whole group. This activity requires students to work on a problem as an interdisciplinary team and to think seriously about the roles of disciplines other than their own. Both the interdisciplinary dinner meeting and the interdisciplinary plant visit and workshop are

required for all ERC students and faculty. Non-supported students in ERC Programs are encouraged to attend and participate in these activities.

The new Occupational Diseases course EHS 251 is interdisciplinary with students from OM, IH, and OEHN participating. All academic programs include some courses where students from all program areas are together. Seminars on occupational health topics are given by the programs and students from all program areas are encouraged to attend.

Nursing 439C and 439D Advanced Practice Nursing, required courses for OEHN trainees, now includes an optional rotation for one or two OEHN trainees to participate in the OH clinic and case conference one day/week at UC Irvine. One nursing student elected this rotation in 2002-03. This activity is open to IH students as EHS 596 Directed Individual Study or Research.

EHS 259A Occupational Safety and Ergonomics is a required course for all IH, OEHN, and OM/UCLA students. It includes a final project where students from each of the disciplines work together as teams to solve problems and prepare a report.

Enrichment and interaction occurs through the close ties between the ERC and other multidisciplinary centers such as the NIEHS Southern California Environmental Health Science Center, the Fogarty International Center, the Center for Environmental Genomics, and the EPA Southern California Particle Center and Supersite. The NIEHS Center has an extensive outreach program.

Regular meetings of our program directors provide interdisciplinary perspective for planning and conducting of ERC activities. CalOSHA internships provide interdisciplinary opportunities for our Industrial Hygiene, Occupational and Environmental Health Nursing and Occupational Medicine students.

Table 1 gives the required courses for the academic programs at UCLA. As can be seen 14 courses are required for at least two disciplines and four courses are required for all three disciplines in our ERC.

Table 1. ERC course matrix.

Number	Title	Units	IH	OEHN	OM
BIO 100A	Introduction to Biostatistics	4	R		R
BIO 100B	Introduction to Biostatistics	4	R		R
CHS 100	Behavioral Science and Health Education	4	R ¹		
EHS 200A	Foundations of Environmental Health Sciences I	6	R	R ³	R
EHS 200B	Foundations of Environmental Health Sciences II	6	R		R
EHS 201	Seminar: Health Effects of Environmental Contaminants	2	R		
EHS 240	Fundamentals of Toxicology	4	R		R
EHS 250D	Industrial Hygiene Practice	2	R		
EHS 251A	Occupational Diseases: Recognition and Prevention	1	R		R
EHS 251B	Occupational Diseases: Recognition and Prevention	1	R		R
EHS 252D	Properties & Measurement of Airborne Particles	4	R		
EHS 252E	Identification & Measurement of Gases & Vapors	4	R		

EHS 252F	Industrial Hygiene Measurements Laboratory	3	R		
EHS 253A	Physical Agents	2	R	R	
EHS 253B	Physical Agents Laboratory	2	R		
EHS 254	Health Hazards of Industrial Processes	4	R	R ³	R
EHS 255	Control of Airborne Contaminants in Industry	4	R		
EHS 256	Biol. & Health Surveillance Monitoring in O/E Health	4	R		
EHS 257	Risk Assessment and Standard Setting	4	R		R
EHS 259A	Occupational Safety and Ergonomics	4	R	R	R
EHS 400	Field Studies in Environmental Health Sciences	4	R ¹		R
EHS 410A	Instrumental Methods in Environmental Sciences	4	R ²		
EHS 598	Master's Thesis Research	8-12	R ²		
EHS M411	Environmental Health Sciences Seminar (1st year)	2	R		R
EHS M411	Environmental Health Sciences Seminar (2nd year)	2	R		
EPI 100	Principles of Epidemiology	4	R	R	R
HS 100	Health Services Organization	4	R ¹		
N200	Biobehavioral Theo. Foundations of Health Assessment	4		R ³	
N204	Research Design and Critique	4		R	
N211F	Theoretical Foundations of Women's Health Care	4		R ³	
N213A	Occupational Health Nursing Role and Theory	4		R	
N213B	Health Assessment, Research and Health Promo. in OH	3		R	
N218A	Nursing Administration Theory	4		R ⁴	
N218B	Nursing Administration Theory	4		R ⁴	
N218C	Nursing Administration Theory	4		R ⁴	
N218D	Nursing Administration Theory	4		R ⁴	
N219A	Essen. of Accounting and Budgeting in Health Care Org.	4		R ⁴	
N219B	Operations Planning and Control for Nurse Admin.	4		R ⁴	
N220	Instruction and Learning in Nursing	3		R	
N225	Pharmacology for Advanced Practice Nurses	4		R ³	
N230	Advanced Pathophysiology	4		R ³	
N239A	Biobehavioral Found. of Acuity and Chronicity in Illness	4		R ³	
N239B	Biobehavioral Found. of Acuity and Chronicity in Illness	4		R ³	
N239C	Biobehavioral Found. of Acuity and Chronicity in Illness	6		R ³	
N264	Professional Issues in Nursing	3		R ³	
N418A	Nursing Administration Practicum	3		R ⁴	
N418B	Nursing Administration Practicum	3		R ⁴	
N418C	Nursing Administration Practicum	3		R ⁴	
N418D	Nursing Administration Residency	12		R ⁴	
N439A	Advanced Practice Nursing: Clinical Practicum	4		R ⁵	
N439B	Advanced Practice Nursing: Clinical Practicum	6		R ⁵	
N439C	Advanced Practice Nursing: Clinical Practicum	6		R ⁵	
N439D	Advanced Practice Nursing: Residency	8		R ⁵	
N440	Advanced Assessment and Clinical Diagnosis Practicum	2		R ³	
N597	Individual Study for Comprehensive Examination	4		R	

R = Required

¹ Required for MPH IH Program only.

² Required for MS IH Program only.

³ One of two required courses.

⁴ Required for Nursing Administration/OEH Specialty only.

⁵ Required for OEHN Adult Nurse Practitioner Specialty only.

e. Meeting regional needs and evaluation of impact of programs

Southern California has many service industries and a large manufacturing base of small and medium-sized industries that represents more than 60% of the manufacturing in California. The workforce is very diverse with many immigrant and non-English-speaking groups. This large concentration of industries in Southern California provides an ideal environment for occupational health education and many opportunities for field trips and internships.

The Southern California ERC has close ties with the state-supported Center for Occupational and Environmental Health (COEH). All of the ERC program directors and a majority of core faculty members are members of both centers. The Southern California ERC and COEH have enhanced their interaction with the occupational health and safety communities in Southern California by hosting at UCLA one of the six annual meetings of the Southern California Section of the American Industrial Hygiene Association (SCAIHA) each year. This venue provides a good opportunity for input from practicing professionals in the greater Los Angeles area. Regular meetings of the ERC advisory board provide input from the business, labor and professional communities in Southern California.

The ERC also has close ties to the **UCLA Labor Occupational Health Program (LOSH)** with its close connection to organized labor in Southern California. The UCLA Labor Occupational Safety and Health (LOSH) Program is a nationally recognized center in Southern California for worker health and safety training, educational materials development, technical assistance and policy information in the area of workplace health and safety. It is part of the UCLA Labor Center, and is affiliated with the UCLA Center for Occupational and Environmental Health (COEH). The Southern California ERC has collaborated with UCLA LOSH for several years. This collaboration includes, joint CE course presentation, consultation and evaluation projects, LOSH trainer teaching in our HAZWOPER course, IH students taking the LOSH HAZWOPER course, and IH student internship opportunities at LOSH. The ERC assisted LOSH in putting on "Voices for Healthy Environment, Healthy Communities, Healthy Jobs," a town hall meeting in Inglewood, CA. The Director of LOSH, Marianne Brown, is a supporting faculty member for the IH Program and a member of our CE advisory committee.

An ERC needs assessment was conducted in early 2003. Questionnaires were sent out to 4281 occupational health professionals in region IX and 424 participants completed the survey. A copy of the survey form is included in Appendix D. Thirty-three (33%) percent of respondents identified themselves as occupational safety professionals, twenty-two (22%) percent as industrial hygienist, and 21% as other. Almost half of the respondents (48%) have worked in occupational safety and health for over fifteen years. Thirty-seven (37%) percent worked in a job with a company of over 1,000 employees. More than half (68%) spent 100 % of their time at work in the practice of occupational safety and health.

Respondents indicated they had mostly used and experienced classes conducted by the continuing education program (21%), research conducted by SCERC faculty and students available through publications or presentations at professional meetings (14%), the expertise

of the graduates and faculty contributed to professional organizations (12%), and the national and regional presence of the ERC as a focal point for occupational safety education (13%).

The products and services most valued by respondents included the classes conducted by the continuing education program (21%), the availability of SCERC faculty as a resource for technical/problem solving (19%), and research conducted by SCERC faculty and students available through publications or presentations at professional meetings (21%).

Respondents indicated that the following topics are the most important in their profession or workplace:

- Recognition, evaluation and control of occupational health hazards (73%)
- Prevention of neuromuscular and skeletal accidents and diseases (64%)
- Chemical hazards (59%)
- Noise (58%)
- How to perform an occupational health assessment (56%)
- Disability/Workers' Compensation (56%)
- Early detection of anatomical failure points and diseases (54%)
- Occupational Health: Introductory Concepts (51%)
- Emergency Care (51%)

We also conducted an outcomes competency survey of our alumni. There were 43 responses with 30 being from IH alumni, eight from OEHN alumni, and five from OM alumni. The survey had 33 competencies grouped into six broad categories: recognition, evaluation, control, communications, professional conduct, and management. A copy of the survey form is included in Appendix D. Respondents were asked to rank each competency in terms of (1) their value in the practice of their profession and (2) their proficiency upon completing the program. Most competencies had similar ranking for value and proficiency. Those competencies where value was ranked high and proficiency was ranked low will receive the most attention in our program review and development. They include: knowing occupational safety and health regulations and laws, anticipation of potential hazards, assessing risk to population health, design and implementation of surveillance systems, communicating effectively with a variety of stakeholders, managing resources effectively, and formulating and implementing guidelines and policies.

Conclusions

The Southern California ERC is well administered under the leadership of its Director, William Hinds, and its Deputy Director, Dean Baker. The enrollment and faculty are stable. The curricula are being improved on a steady and regular basis to meet changing conditions in the work environment. The interdisciplinary environment for students is strong. The SCERC is meeting the needs of user groups in Southern California.

Continuing Education and Outreach

Abstract

The Continuing Education and Outreach (CE/O) Program is the visible link between the academic applied research community and the practicing community. Through Continuing Education, the Southern California Education and Research Center (SCERC) reaches out to regional physicians, nurses, industrial hygienists and technicians, including personnel from labor-management health and safety committees. CE/O also enhances occupational safety and health activities through outreach to other educational institutions, related University departments and local and national organizations.

The CE/O Program serves NIOSH Region IX, which includes Southern California, Nevada, Arizona, Hawaii, Guam, the Northern Marianas and the Trust Territories. Collaborations include the UCLA Labor Occupational Safety and Health (LOSH) Program, UCLA/UCB/UCI Centers for Occupational Safety and Health (COEH), Southern California American Industrial Hygiene Association (SCAIHA), Committees for Occupational Safety and Health (COSH) in Southern California, and the California Section of American Occupational Health Nurses (CSAOHN), among others. Additional funding has been secured from the UCLA Labor Occupational Safety and Health (LOSH) Program and the NORA Research Support Program, for staff support and program activities.

The Continuing Education and Outreach (CE/O) Program has been an important source of education and outreach for occupational safety and health professionals in Region IX, for over twenty years. Administrative and location changes within the past six years may have briefly hindered program activities, but the stability of a new location and the commitment of a full time staff has resulted in an increase of course offerings and participants in the last two years. Dedicated and hard working staff, prominent faculty and valuable educational materials are all part of the mission to continue to provide quality, multidisciplinary education and outreach activities. In the next five years, the CE/O program of the SCERC intends to grow further, to become one of the leading sources of continuing education and outreach for occupational safety and health professionals and workers in the region.

Program Report

Staff

Claudia Molina, is the full time Director of the CE/O Program. Ms. Molina is responsible for overall CE direction, curriculum development and updates, teaching, marketing, on-site coordination, new program design and follow-up evaluation of short courses. She is an active member of the Southern California Section of the American Industrial Hygiene Association (SCAIHA), American Public Health Association (APHA) and the California Section of the American Occupational Health Nurses (CSAOHN). Ms. Molina also serves on the ERC Executive Committee, the CE Advisory Committee and the Education Committees for the Industrial Hygiene Technical Symposium (SCAIHA), Committees for Occupational Safety and Health (COSH) and the CA State Association of the Occupational Health Nurses Annual Conference (CSAOHN).

Jeimy Gama, is the full-time program facilitator. She has been with the CE/O Program for three years and has over three years of experience in program administration. Ms. Gama supports the CE program with marketing, conference registration, financial authority, materials preparation, mailing list support, meeting site location/logistics, faculty coordination and on-site conference facilitation.

Advisory Committee

The ERC Executive Committee and CE Advisory Committee provide general guidance and serve as a sounding board for specific problems and concerns. Because both groups represent a broad range of occupational health and safety professionals, multidisciplinary needs will be well represented. These committees are comprised of one or more of the core program directors, other professionals in the academic community, representatives from labor, industry, and government, and members of specialty societies. Continuing Education staff will use select planning committees for individual course development. The CE Committee meets at least yearly to conduct an overall evaluation of the program and discuss future directions. Regular contact is also achieved through less formal means such as e-mail and telephone.

Faculty Commitment, Breadth, Reputation and Strength for Each Program Area

Faculty in the CE Program represent the intra-university consortia members-UCLA Center for Occupational and Environmental Health (COEH), including the School of Medicine, the School of Nursing and the School of Public Health, and the University of California, Irvine, College of Medicine, as well as local, regional and nationally recognized experts.

The use of academic professionals and practicing occupational safety and health professionals enables us to present participants with a varied perspective of occupational health, safety and environmental issues. Program content has been enhanced by the faculty's active participation in professional organization such as the American Industrial Hygiene Association (AIHA), American Society of Safety Engineers (ASSE), California State Association of Occupational Health Nurses (CSAOHN), American Public Health Association (APHA), American College of Occupational and Environmental Medicine (ACOEM), and others. These affiliations have enabled faculty to stay abreast of current issues, needs, and practices.

At UCI, it is important to note that many courses are offered through the Extension Certificate Program, a self-supporting unit of the UC System.

Industrial Hygiene

Core faculty commitment includes involvement of Dr. William Hinds, Dr. Nola Kennedy at UCLA and Ralph Allan, JD and Dr. Robert Phalen at UCI. Other potential course directors, speakers, or workshop leaders include: John Howard, MD, MPH, JD NIOSH; Richard Warner, MS, CIH, CSP; Hamid Arabzadeh, CIH, CHMM, UC Irvine; Howard Spielman, CIH, PE, CSP, REHS; Susan Rosenberg, CIH, CHMM; Maureen Sassoon, Dr.PH, CIH; and Jeffrey Birkner, MS, CIH.

Future Plans

Future Plans

The CE/O Program will continue to collaborate with the Southern California and Orange County AIHA to coordinate the annual IH Technical Symposium. Relationships with the AIHA local chapters in Arizona, Nevada and Hawaii will be established to seek opportunities for course offerings in those states. The Certified Industrial Hygiene Review Course will be reinstated due to numerous requests and lack of availability in the region. Based on the results of the 2003 SCERC needs assessment courses will be developed in chemical hazards, recognition and control of occupational health hazards, and IH introductory concepts. SCERC IH faculty will continue to assist with course development and curriculum review. Faculty such as Dr. Kennedy (CAOHC Approved Hearing Conservation), will continue to teach in CE courses.

Occupational Health Nursing

Dr. Wendie Robbins and Ms. Carol Murdock, UCLA, spearhead the academic and continuing education ERC component. CNE courses include the NIOSH Approved PFT, CAOHC Approved Hearing Conservation Training and Refresher, OHN Review and Workers Compensation and Disability Case Management. Annette B. Haag is course director for the Occupational Health Nursing Review. Ms. Haag is past president of the American Association of Occupational Health Nurses (AAOHN). Deborah DiBenedetto, current President of AAOHN is course director for the Workers Compensation and Disability Case Management Courses. Other potential speakers include Linda K. Glazner, Dr. PH, RN, CCM, COHN-S and Barbara Burgel, RN, MS, FAAN.

Future Plans

SCERC faculty such as Ms. Murdoch (CAOHC Approved Hearing Conservation) will continue to teach in our CE courses. CE/O will continue to co sponsor courses with the OHN program such as the Creating and Managing Budgets for Occupational Health Units, in February 2003. The OHN program will continue to assist CE/O with course logistics, such as reserving classrooms in the School of Nursing. CE/O co-sponsored the Nursing Health Review and Workers Compensation and Disability Case Management Courses in Las Vegas, NV with Annette Haag and Associates in July 2003. Based on results from the 2003 regional needs assessment we will continue to offer the disability and workers compensation and ergonomic classes. A course in health assessment will be added to the program, among others. CE/O staff will continue to consult with SCERC faculty on future OHN courses and curriculum review.

Occupational Medicine

Potential course directors, speakers and workshop leaders include: UCI-Dean Baker, MD; Joe Fedoruk, MD; Peter Schnall, MD and a host of affiliated faculty; UCLA-Phil Harber, MD; Craig Conlon, MD; Edward O' Neil, MD, MPH; Paul Papanek, MD, MPH; Peter Wald, MD, MPH; and associated physicians.

Dr. Dean Baker has provided active CME through monthly occupational medicine clinical case conferences, seminars, journal clubs and grand rounds. Others active in an advisory and teaching capacity have been Craig Conlon, MD. Dr. Conlon is course director for the NIOSH Approved PFT course.

CE/O will continue to offer the Occupational Medicine Seminar in collaboration with UCLA faculty. Collaborations that lead to providing CME's will be pursued. CE/O staff will establish relationships with medical associations such as the American College of Occupational and Environmental Medicine (ACOEM) to assist with course development, implementation and marketing. The CE/O Director will conduct focus groups for Dr. Harber-UCLA, as part of the Pilot Project evaluating ergonomics in dental hygiene. She will also assist Dr. Baker-UCI in coordinating an international conferences in 2005 on work stress and organization. CE/O and Dr. Baker will also collaborate to develop continuing education and outreach activities to raise awareness about NORA research and bring NORA-related research findings to those who can effect change that will reduce illness and injury. CE/O staff will continue to consult with UCLA/UCI faculty in planning meetings, teachings and review curriculum materials. SCERC faculty such as Dr. Harber (Occ. Med. Series), Dr. Conlon (NIOSH Approved Pulmonary Function Testing) and Dr. Baker (Workplace Psychosocial Factors in Occ. Health) will continue to teach in CE courses.

Occupational Safety

Potential course directors, speakers and workshop leaders include: Dr. Victor Liu; Tom Butler, CSP; Joel Berman, CSP; Howard Spielman, PE, CIH, CSP, REHS; David Rempel, MD, MPH, CPE; Ira Janowitz, PT, CPE; and Richard Warner, MS, CIH, CSP.

Future Plans

CE/O will establish relationships with the ASSE local chapters for course development and implementation. Based on 2003 SCERC regional needs assessment courses in noise, recognition, evaluation and control of occupational health hazards, and chemical hazards will be developed. Based on a meeting with board members from local chapters of ASSE, in December 2002 courses in safety program management and OSHA regulations will also be developed. CE/O will continue to pursue collaborations with Dr. Victor Liu and COSH to conduct safety courses for workers and union members.

Hazardous Substance Training

Dr. William Hinds, CIH, is Director of the Hazardous Substance Academic Training Program (HSAT) and Director of the NIOSH-sponsored Industrial Hygiene Graduate Training Program, UCLA. His role is advisory in nature. Other potential speakers include: Maureen Sassoon, CIH, DPA, MPH; Gary Kelley, BS; and Arlene Feingold, CIH. Dr. Sassoon has conducted numerous 40-24 and 8 hour HAZWOPER courses for government and private industry.

Future Plans

The CE/O Program will develop and implement courses in bioterrorism and emergency preparedness. Collaborations with programs such as the UCLA Center for Emergency Preparedness will be pursued for course development and implementation. Other possible course topics and speakers will be identified through consultations with professional associations and faculty. CE/O staff will conduct focus groups and pre and post tests for UCLA LOSH as part of their CA-AZ Consortium on Weapons of Mass Destruction Training. Pre and post test will also be developed for the CHMM course to evaluate course effectiveness. SCERC faculty will continue to teach in the 40 hr course, among others. Based on results from the 2000 Hazardous Substance Training and 2003 regional needs

assessment CE/O will conduct courses on exposure assessment, emergency response, health effects of hazardous substances, laws and regulations, identification and analysis of hazardous waste, risk assessment and risk communication. Courses on the Injury and Illness Prevention Program (IIPP) and Respiratory Protection will also be developed.

Courses Offered by Specialty Area

The statistical reports for the past three years are summarized in *Appendix D* at the end of this section. From July 1, 2001 through June 30, 2004, 95 courses were offered, either directly or through co-sponsorship arrangements, with attendance estimated at 2,542. This meets the NIOSH criteria to impact 400+ students per year.

Content covers the disciplines of occupational medicine, occupational health nursing, industrial hygiene, ergonomics, safety and other related areas. We continue to work towards a more extensive, balanced program among the specialty areas and interdisciplinary education.

The following courses were offered within each specialty area.

Industrial Hygiene	Course Length
IH Technical Symposium	5 days
Ergonomics Job Analysis	2 days
Occupational Ergonomics	4 days
Comprehensive IH Review	5 days

Occupational Health Nursing	Course Length
NIOSH Approved Pulmonary Function Testing	2 days
CAOHC Approved Hearing Conservation/Refresher	3 days/1 day
Worker's Compensation and Disability Case Management	2 days
Occ. Health Nursing Review	3 days
Creating and Managing Budgets for Occ. Health Units	1 day
CA/NV State Assoc. of Occ. Health Nurses Annual Conference	2 days
Essential Business Skills for OH Professionals	1 day

Occupational Medicine	Course Length
Occupational Medicine Seminar	Twice a month/2 ½ hours
Occupational Medical Journal Club	Twice a month/2 ½ hours
Occupational Grand Rounds	Monthly/4 th Tuesday for 2 hours/except Dec.
Work Environment Cardiovascular Disease	1 day

in Clinical Practice	
Occupational Medicine Series: Occupational Diseases	10 courses, each 2 hours, offered every other week for 4 months

Occupational Safety	Course Length
Respiratory Protection Program Administrator	1 day
Advanced Office Ergonomics I, II, III	1 day
California Ergonomic Update	1 day
OSHA's Recordkeeping Update	1 day
Workplace Safety/Health-Train the Trainer	1 hour
Incident Investigation: Identifying/Solving Health/Safety Problems	1 hour
Understanding OSHA 300 Log	1 hour
Injury Illness Prevention Program	1 day

Hazardous Substance Training	Course Length
40-Hour HAZWOPER	5 days
24-Hour HAZWOPER	3 days
8-Hour HAZWOPER	1 day
Certified Hazardous Materials Manager Review Course	3 days
Certified Hazardous Materials Manager Exam	.5 day
Hazards of Pesticides	.5 day

Other Courses	Course Length
Interdisciplinary Seminar	1 day
Occ. Health Psychology Work Organization and Health	1 day
CA Research Colloquium on Workers Compensation Medical Benefit Delivery and Return to Work	2 days
Importance of Workplace Psychological Factors in Occ. Health	1 day
The Way We Work and It's Impact on Our Health	2 days

Needs Assessment

Formal and informal needs assessments are continually conducted. They are the foundation for determining course content and direction. We will continue to plan programs based on

our experience and insight gained from local, regional and national questionnaires. The primary source of needs assessment has been via word of mouth and:

- Suggestions from students and association members, Advisory Board members
- Information gathered through the national NIOSH ERC Continuing Education Exhibit and other local and national conferences
- Course evaluation summaries; observing trends through journal readings

Two formal needs assessments were conducted during this grant period-the first through the ERC in December of 2002, and the second in February-March 2003.

In the first activity, 144 needs assessment surveys were mailed to SCERC alumni in December of 2002. The ERC realized a 30% response rate, with 43 returns. The target population was reached through the mailing list kept by program directors of the ERC. Data analysis and a summary report were completed by a second year nursing graduate student.

The second initiative was conducted in February-March 2003. Ms. Molina conducted a Needs Assessment of Region IX, which included Arizona, Nevada, and Hawaii. 4,281 needs assessment surveys were mailed to industrial hygienists, occupational health nurses, occupational health physicians and safety professionals. The ERC realized a 10% response rate, with 424 returns.

The third needs assessment was conducted in April-May 2004. The purpose of this survey was to identify the important areas in hazardous substances for teaching and research in the programs of the Southern California Education and Research Center. The questionnaire mailed to 1815 occupational safety and health professionals gathered information on work setting, if the company/organization was a generator of hazardous substances, if the company/organization had hazardous substance sites, the hazardous substance activities their company/organization was involved with, years the company/organization had been working with hazardous substances, number of industrial hygienist employed by the company/organization and number of industrial hygienist certified. 135 participants completed the survey. Questionnaires were mailed to 622 safety engineers, 925 industrial hygienist, and 268 government employees within the geographic areas of NIOSH Region IX (Southern California, Nevada, Arizona, and Hawaii). One half of each questionnaire was related to the hazardous substance training program and the other half to the hazardous substance academic training program.

As part of the NORA Research Support Program, CE/O will collaborate with Dr. Dean Baker (UCI), ERC Deputy Director and Nora Research Support Program Director in assessing regional needs for research and research training in NORA priority areas. A survey of program graduates and stakeholders (employers, unions, worker advocacy groups, and professional organizations) will be conducted to assess awareness about and the perceived need for NORA research and research training.

Accreditation

Courses offered through the CE/O Program are accredited for professional points from specialty societies such as the American Board of Industrial Hygiene (ABIH), the California

Board of Registered Nursing, and are eligible for maintenance points from the Board of Certified Safety Professionals (BCSP). CE/O has also provided CEUs from the State Bar of California (MCLE) and the National Commission for Certifying Agencies, which represents the Commission for Case Manager Certification (CCMC), Certification of Disability Management Specialist (CDMS) and Commission on Rehabilitation Counselor Certification (CRCC). CMEs are provided in conjunction with the Center for Occupational and Environmental Health (COEH), Continuing Education Program, at UC Berkeley and the UCLA School of Medicine.

Program Evaluation

The International Association of Continuing Education Providers (IACEP) along with many professional specialty societies require an evaluation tool to award CE accreditation. We will continue to follow guidelines established by these organizations to assure sound educational experiences. Each course is evaluated by students in terms of content, format, speakers, facilitation and physical facilities. An evaluation summary is provided to all those involved in the program for review. Program updates and/or improvements are based upon results from evaluations.

Measures of Effectiveness

New measures of evaluation will be incorporated along the lines of measuring performance. This will shift from what participants need to learn (training) to what they must do (performance). Pre and post tests are provided in the Occupational Health Nursing Review and the NIOSH Approved Pulmonary Function Courses. Additional testing will be incorporated into the Certified Hazardous Materials Manager, 40 and 24- Hour HAZWOPER Courses. A formal method of tracking the performance of participants that have taken our examination preparation courses will be developed. Currently, CE/O staff use an informal approach, usually completed by telephone, to obtain information on the passing rates of these participants.

Facilities and Resources

The administrative office of the CE/O Program is located within the Environmental Health Sciences Department, of the School of Public Health, at the University of California, Los Angeles. The office suite is shared with the Director of the SCERC, Dr. William C. Hinds. A resource library, available to students and faculty is also located in this suite. The COEH and LOSH libraries (located on UCLA campus), which include several bilingual educational and training resources are also available to SCERC students and faculty.

To provide broader geographic service, courses are offered in several locations throughout the greater Los Angeles basin. Courses are conducted at the following locations:

1. UCLA's Center for Occupational and Environmental Health (COEH)
2. UCI's Center for Occupational and Environmental Medicine (Irvine, CA)
3. UCLA's Sunset Village Conference Center
4. UCLA's School of Nursing/School of Medicine
5. Four Points Hotel (Los Angeles, CA)

6. County of Ventura-General Services Agency
7. County of Santa Barbara-Employee University
8. Embassy Suites (Las Vegas, NV)
9. Coast Anaheim Hotel (Anaheim, CA)
10. Palace Station Hotel and Casino (Las Vegas, NV)
11. Regency Plaza and US Grant Hotel (San Diego, CA)

The Sunset Village Conference Center, located within the UCLA campus serves as our primary training facility. The center contains numerous meeting spaces of various sizes, equipped with internet access and two computer laboratories. Several affordable restaurants are located within walking distance. The center is easily accessible from all major highways and two main airports, Los Angeles International (LAX) and Burbank.

The CE/O program owns its own audio visual equipment which includes a laptop computer, slide projector, overhead, slide, and LCD projector. Equipment (personal protective equipment and instrumentations) used for selected courses like HAZWOPER, NIOSH Approved Pulmonary Function Testing and CAOHC Approved Audiometric Certification is rented from manufacturers.

New and Innovative Technologies

With the ever-increasing availability of new technologies in the fields of teleconferencing and distance learning, the SCERC will continue to explore ways to take advantage of these emerging educational formats. The CE/SCERC will continue to collaborate in distance learning activities with partners such as the UCLA COEH, and CSAOHN when the opportunity presents itself.

The CE/O Program, in collaboration with CA/NV AOHN developed CD-ROMs of one of the presentations from its annual nursing meeting in Nevada, in 2002. The CD-ROMs were provided to all interested attendees, free of cost. Presentations from the California Research Colloquium on Worker's Compensation Medical Benefit Delivery and Return to Work, in May 2003 and the Importance of Workplace Psychosocial Factors in Occupational Health, in November 2002, were displayed on the web. CE/O staff will place future presentation on the SCERC/CE website.

Marketing and Promotion

The following promotional activities will take place to increase the visibility of the SCERC and its CE courses:

- SCERC Center wide Brochure
- Individual course announcements
- Exhibits at local and national meetings (AIHCE, ASSE and CSAOHN)
- Co-sponsorship of several educational offerings (UC Berkeley, University of Michigan, UCLA Labor Occupational Safety and Health (LOSH) Program, Committees for Occupational Safety and Health (COSH), California Section of

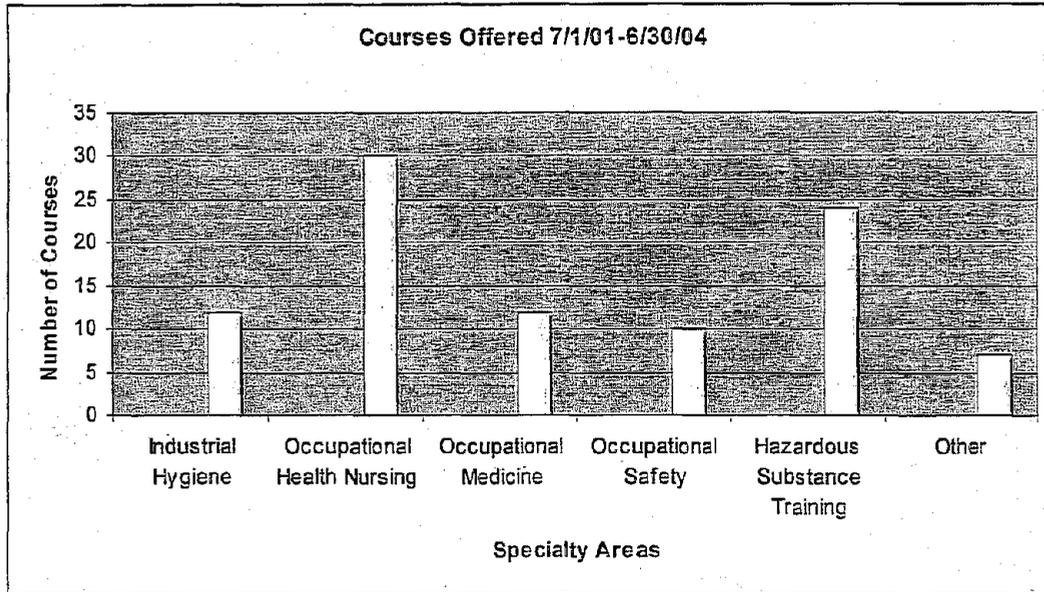
American Occupational Health Nurses (CSAOHN), Southern CA/Orange County AIHA, CA Commission on Health and Safety and Workers Compensation/CA Dept. of Industrial Relations, Academy of Certified Hazardous Material Manager (ACHMM), and the National Guard Bureau)

- Course announcements in newsletters and/or websites of professional organizations and/or other university programs
- SCERC Website/CE Program Webpage

Course Statistical Report

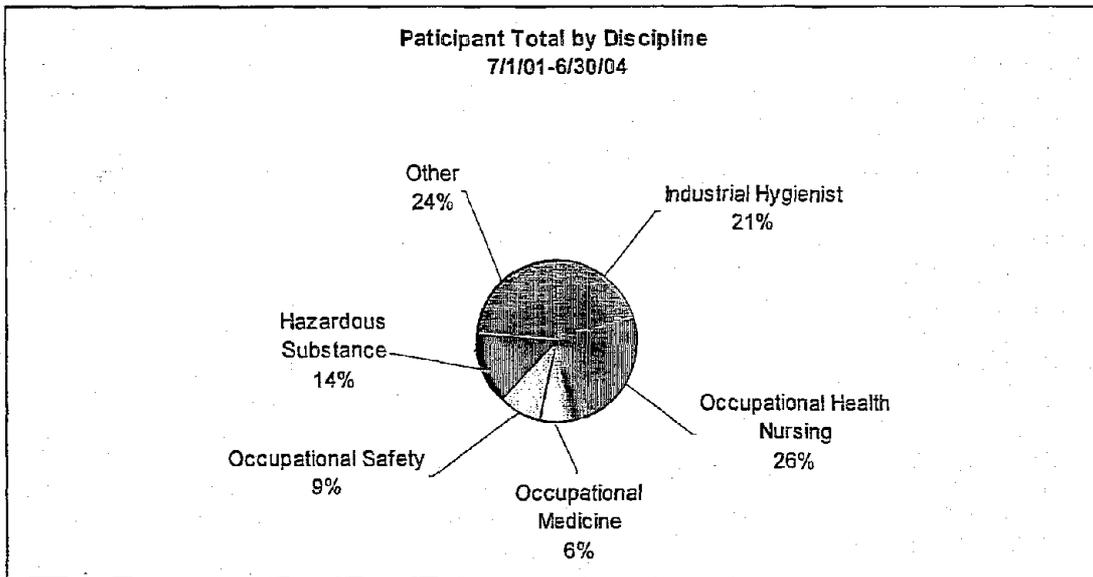
The following graphs depict courses offered from July 1, 2001 through June 30, 2004.

Industrial Hygiene	12
Occupational Health Nursing	30
Occupational Medicine	12
Occupational Safety	10
Hazardous Substance Training	24
Other	7
Total	95



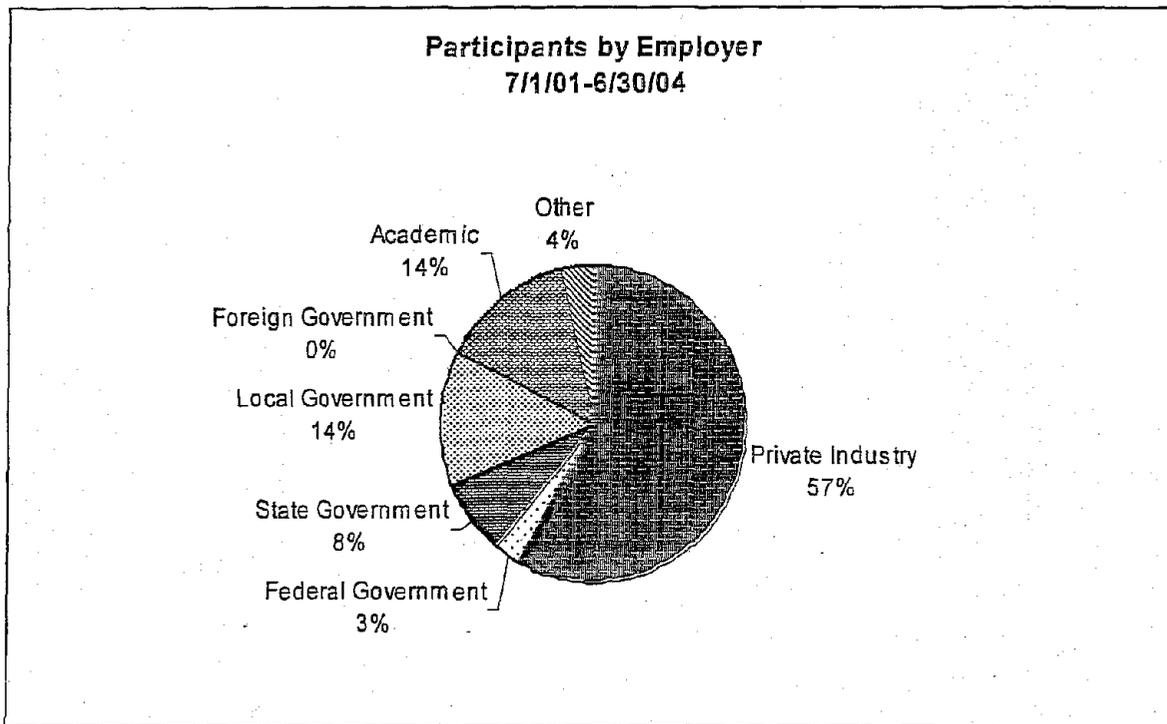
Participant total by discipline is shown below.

Industrial Hygienist	524
Occupational Health Nursing	671
Occupational Medicine	165
Occupational Safety	225
Hazardous Substance	352
Other	605
Total	2542



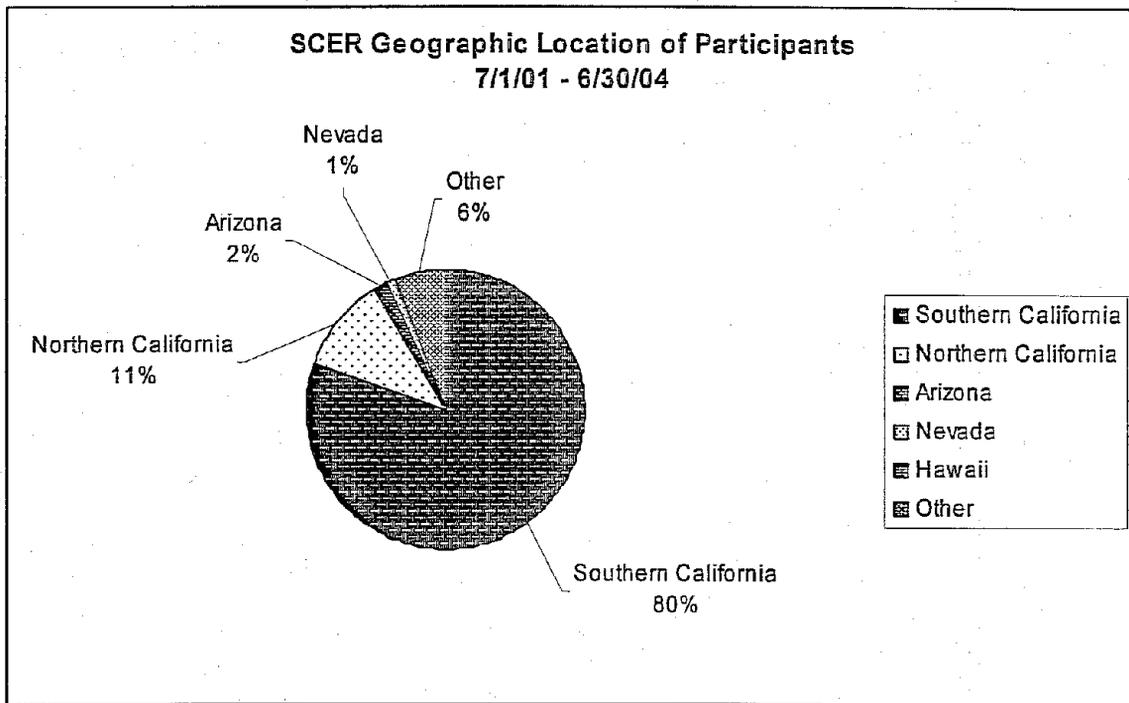
Breakdown of participants by employer is presented in the following graph.

Private Industry	1479
Federal Government	73
State Government	193
Local Government	350
Foreign Government	5
Academic	348
Other	94
Total	2542



Breakdown of participants by geographic location is shown below

Future Plans	
Southern California	2043
Northern California	278
Arizona	47
Nevada	21
Hawaii	3
Other	150
Total	2542



**Number of ERC Students in Continuing Education Courses
 July 1, 2001 to June 30, 2004**

COURSES	DATE	# STUDENTS
1. Workers Compensation/ Disability Case Management	August 4-5, 2001	1 student
2. CA State Assoc. of Occ. Health Nurses Annual Conf.	October 12-13, 2001	3 students
4. Importance of Workplace Psychosocial Factors in Occ. Health	November 11, 2002	11 students
5. CA Ergonomic Update	January 25, 2002	1 student
6. Occ. Health Psychology		
7. Work Organization/Health	March 6, 2002	7 students
8. NIOSH Approved PFT	March 22-23, 2002	1 student
9. Interdisciplinary Seminar	May 9, 2002	37 students
10. CA/NV State Assoc. of Occ. Health Nurses Annual Conf.	October 4-5, 2002	4 students
11. NIOSH Approved PFT	November 15-16, 2002	3 students
12. Asthma and Airway Disorders	February 5, 2003	7 students
13. Creating and Managing Budgets for Occ Health Units	February 26, 2003	6 students
14. Interdisciplinary Seminar	February 28, 2003	40 students
15. NIOSH Approved PFT	March 28-29, 2003	2 students
16. Occupational Medicine Clinical Case Study	year round	8 students
17. Occupational Medicine Seminar	year round	5 students
18. Occupational Medicine Grand Rounds	ongoing	25 students
19. NIOSH Approved PFT	March 19-20, 2004	5 students
20. CAOHC Approved Hearing Conservation Training	March 30-April 1, 2004	4 students
21. Advanced Office Ergonomics	May 17, 2004	1 student
22. The Way We Work and It's Impact on Our Health	April 22-23, 2004	8 students

Program Area	Number of Courses	Total Trainees	Total Person Days	Trainees by Discipline					Trainees by Employer						
				MD	NURS	HYG	SFY	OTHER	Private Industry	Fed Gov	State Gov	Local Gov	Foreign Country	Academic	Other
Industrial Hygiene	12	524	988	20	28	230	133	113	383	13	61	27	0	8	22
Occupational Health Nursing	30	671	1439	4	551	0	6	110	556	27	16	17	0	49	6
Occupational Medicine	12	165	185	117	12	20	2	14	57	0	2	0	0	99	7
Occupational Safety	10	225	183.6	11	8	18	29	159	131	7	35	29	0	11	12
Hazardous* Substance Training	24	352	368.5	0	0	24	150	178	73	14	29	235	0	0	1
Other Courses	7	605	725.4	62	124	104	97	218	279	12	50	42	5	181	36
GRAND TOTAL	95	2542	3889.5	214	723	396	417	792	1479	73	193	350	5	348	84

* # estimated for Hazards of Pesticides - data being sent

NORA Research Support

Abstract

The NORA Research Support Program (NORARS) was initiated in 2002 and had a two year project period prior to the competitive renewal of the Southern California ERC.

The program's goal has been to support implementation of the National Occupational Research Agenda (NORA) through (1) facilitating interdisciplinary research on NORA priority areas; (2) supporting research training of graduate students in ERC programs; and (3) organizing outreach and education programs to disseminate information about NORA and NORA research topics.

Specific objectives during the reporting period were: (1) to raise awareness about NORA within the universities and in the region; (2) to facilitate interdisciplinary research training on NORA areas within the universities; (3) to support ERC trainees to undertake research in NORA areas; and (4) to organize continuing education and outreach activities to raise awareness about NORA and to communicate findings of NORA-related research at the universities and within the region.

Two strategies were implemented to address the first objective of raising awareness about NORA. The first strategy was to conduct a regional needs assessment in conjunction with the ERC needs assessment and outcome survey. In addition, the program printed and displayed the NORA workgroup posters at ERC events and conferences to raise awareness about NORA.

To address the second and third objectives, the program provided: some support for teaching research methods in courses and field projects; limited support for NORA-related research projects that had training components; and stipend support to trainees in the ERC core programs to undertake NORA-related research for their master's thesis or doctoral dissertation. Three research projects and three doctoral students received support during the reporting period. In conformance with the NIOSH program guidelines, the NORA trainee support did not duplicate trainee support provided by the core programs. The ERC identified three priority areas related to these two objectives. One was to encourage research training in work organization and workplace psychosocial factors, which is a training initiative of the Southern California ERC. Another was to support research training for doctoral students in the Industrial Hygiene program, which is the only core program with approved doctoral training within the ERC. The third priority was to encourage research by trainees in the occupational medicine and occupational health nursing programs, which do not currently have doctoral training programs. These NORA research training activities have the potential to lead to proposals for new research training programs within the ERC during the next training period.

The fourth objective was to increase awareness about NORA research findings by using continuing education and outreach to inform regional stakeholders. The NORA Research Support program has collaborated with the Continuing Education/Outreach program to

develop conferences and communications related to the NORA research findings. The NORA program and research findings relevant to NORA were presented in several ERC organized continuing education and research programs during the reporting period.

Program Report

A. Goals and Objectives

The program's goal has been to support implementation of the National Occupational Research Agenda (NORA) through (1) facilitating interdisciplinary research on NORA priority areas; (2) supporting research training of graduate students in ERC programs; and (3) organizing outreach and education programs to disseminate information about NORA and NORA research topics.

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B. Accomplishments

The ERC Director and Core Program directors met in 2002 to discuss the program's goals, objectives, strategies, and to identify initial priorities for program implementation. Dr. Baker was appointed as the program director. The committee identified three priority activities for the program's initial year: (1) conduct a regional needs assessment survey to assess awareness about the NORA and perceived need for NORA research and research training; (2) provide support for interdisciplinary research projects that would enhance the ERC research training in NORA areas; and (3) offer research symposia at UCLA and UCI to increase awareness among the faculties about NORA research priority areas. During the second year, the program implementation strategy was modified to provide support for NORA-related research training in courses with limited support for field-based research training. In addition, the program provided some stipend, administrative, and equipment support to doctoral students in the Industrial Hygiene core program, who were conducting NORA-related research projects. The program continued to support continuing education and research symposia that highlighted NORA priority areas.

Raise Awareness about NORA within Universities and Region

NORA Regional Needs Assessment Survey. An initial program activity was to conduct a regional needs assessment to evaluate awareness about NORA and perceived need for NORA research and research training. This activity was conducted in conjunction with an ERC needs assessment survey. The ERC needs assessment was distributed to a wide range of occupational health professionals and organizations, employers, and worker groups in the region. The NORA component of the survey was limited because the NORA program was implemented after the ERC needs assessment survey had been developed. Nevertheless, the

limited needs assessment confirmed initial impressions about the need to enhance awareness about NORA and the importance of NORA research support.

NORA Workgroup Posters. In order to raise awareness about NORA within the universities and at outreach meetings, the program downloaded and printed on durable plastic the posters developed by the NIOSH NORA workgroups. These posters were displayed at the UCLA School of Public Health and at the UCI Center for Occupational and Environmental Health. In addition, the posters were displayed at various ERC-related meetings and conferences. At these meetings, Dr. Hinds or Dr. Baker described the NORA program and the objectives and activities of the NORARS program. Displaying these posters appeared to be a very effective method to raise awareness about NORA research training opportunities.

Facilitate Interdisciplinary Research Training on NORA Areas

To address the second objective, the program provided limited support for NORA-related research projects that had training components and support for teaching research methods in courses and field projects.

Interdisciplinary NORA Research Projects. During the first training year, a request for proposals was developed and circulated via e-mail to ERC faculty, COEH-affiliated faculty, and related academic programs and centers at UCLA and UCI. The request described the NORARS program's objectives and provided instructions for preparing proposals. Three applications were submitted in two NORA priority areas: (1) two related projects on ergonomics and upper extremity disorders among dental hygienists, and (2) a multi-campus training and research project on work organization and workplace psychosocial stress. Each proposal involved faculty from at least two ERC core programs and graduate students. The proposals were reviewed and approved by the ERC Advisory committee using the criteria specified in the call. The projects received limited funding for one year.

During the second training year, a ERC pilot project proposal was received on a topic related to the ergonomics and upper extremity disorder project. This proposal was submitted by a UCLA occupational medicine resident, who is required to complete a research project during the residency program. Following peer review within the Pilot Project program, the pilot project was funded from NORARS program funds because the theme was consistent with the NORARS program objectives. This support did not replace or duplicate any ERC core program stipend support for the occupational medicine resident.

Research Training in ERC Courses. A focus of the initial research training for the NORARS program has been the ERC initiative in work organization and workplace psychosocial factors. Dr. Schnall and Dr. Baker have provided lectures to the graduate students from Industrial Hygiene program, Occupational Health Nursing program, and Occupational Medicine Residents at UCLA and UCI. Lectures were developed that focused on the importance of psychosocial factors at work places and survey instruments to identify work-related stressors, as well as knowledge about psychological and cardiovascular endpoints. Two new courses were developed. At UCLA, CHS 278 – Occupational Health Psychology was developed by Dr. Peter Schnall and Dr. Judith Siegel of the UCLA SPH and has been offered each year. In addition to introducing students to the basic concepts, the course provided practicum research training in psychosocial stressor questionnaire use and

measurement of blood pressure in the workplace. Another course in Occupational Cardiology was developed by Dr. Peter Schnall and Dr. Karen Belkic for the UCI occupational medicine residents. This course offered training in clinical research methods related to assessing work stressors and cardiovascular function.

Support ERC Trainees to Undertake Research in NORA Areas

The program has encouraged and facilitated NORA-related research by doctoral students affiliated with the ERC. In addition, as noted above, the program supported research by an occupational medicine resident. This support included some stipend support for the doctoral students, as well as some support for equipment and supplies needed for the projects. The objective has been to encourage ERC trainees to undertake their research training in NORA priority areas, so that they will be more likely to pursue research careers in these areas. The following three doctoral students received support during the reporting period:

Maritza Jauregui (UCI, supervised by Dr. Schnall) – Job Strain, Hypertension, and CVD Risk among DaimlerChrysler-UAW Employees. Ms. Jauregui, a doctoral student in the Environmental Health Sciences and Policy Program at UC Irvine, was partially supported for field research training through the NORA/RS Program.

The project examined the relationship between workplace psychosocial factors and blood pressure. The study team collected questionnaire data and blood pressure measurements using an automatic arm monitor from all eligible employees (approximately 160 subjects) at the DaimlerChrysler Los Angeles Parts Distribution Center (LAPDC) in Ontario, CA. The subjects were given the option of participating in additional blood pressure measurements using an ambulatory arm monitor or wrist monitor worn during working hours. The study is part of a larger project that will use the aggregate data from this study, stripped of individual identifiers, as well as company data and data collected at other DaimlerChrysler facilities to examine the relationship among job characteristics, hypertension, and cardiovascular disease risk among autoworkers in the United States.

Robert Phalen (UCLA, supervised by Dr. Hinds) – Quantitative Surface Analysis For The Permeation Of Captan Through Gloves And Contaminated Surfaces

The fungicide captan is one of the more common and irritative of the pesticides utilized. The hypothesis is that a suitable surface analysis technique can be found to detect quantitatively captan formulation permeation through gloves and contaminated surfaces. In this study, the breakthrough and permeation of captan wettable-powder formulations are being measured through common glove materials using American Society for Testing and Materials (ASTM) and attenuated total reflectance Fourier transform infrared (ATR-FTIR) methods. The primary aim is to develop and compare a new ATR-FTIR spectroscopy method with the standard ASTM method.

Jeffrey Birkner (UCLA, supervised by Dr. Hinds) – Release of Anthrax Simulating Particles from Commonly Used Respirator Filters

The project is a laboratory-based study that is quantifying the fractional release of anthrax-simulating particles from respirators when they are dropped onto a hard surface. The primary goal is to more clearly quantify the fractional release of anthrax-simulating particles from respirators that are dropped onto a hard surface. The investigation was designed to characterize the potential for release as a function of particle size, the particle load on the respirator, and the height of the drop. A test matrix is being used that will allow comparison of the effect of each of the variables. The two types of respirator that are being studied are disposable N95 respirators (dust masks) and half-mask respirators with air-purifying cartridges.

Organize Research Symposia, Continuing Education and Outreach Activities

At the initial planning meeting, the ERC program directors concluded that an important task was to increase awareness about the NORA priority areas among faculty at UCLA and UCI, as well as within the region. The objective was to encourage faculty to develop research proposals in NORA priority areas and to encourage graduate students to undertake their thesis research in NORA priority areas. In addition, the NORARS program should be used to convey the results of recent research in NORA priority areas by providing limited support for research symposia.

One example of the strategy to raise awareness, as mentioned above, was to download and print the NIOSH NORA workgroup posters. These posters have been used in ERC meetings and continuing education courses to raise awareness about NORA.

An example of continuing education and outreach meeting was the program organized in fall 2002 on workplace psychosocial stress and cardiovascular disease. This program was offered at the UCLA conference center and attended by researchers, employers, and occupational health professionals from the region. The program provided a summary of research on work-related stressors and health effects, and then had breakout workgroups to discuss the implications and develop strategies for applying this information in managing workplaces to prevent and reduce occupational stress. The program also identified continuing research and policy needs. The NORARS and Continuing Education/Outreach Programs also sponsored a public forum on Work Organization during Spring 2003.

A third strategy has been to collaborate with the Continuing Education/Outreach program to develop outreach activities related to NORA. One activity has been developing sections of the COEH quarterly newsletter that provides information about the ERC NORARS program activities. This newsletter is distributed to more than 2,000 professionals, academic programs, and organizations in the region.

List of Publications and Theses by Program Area

Articles published, accepted, or submitted during the period 7/1/99 to 7/1/04 by ERC core program faculty members are listed below. Listed alphabetically by first author. Trainee authors are underlined.

Industrial Hygiene

Azari, M.R. and Que Hee, S.S., " Application of a Micro-Packed Injector (MPI) for Analysis of Condensable Markers of Lipid Peroxidation in Exhaled Breath, submitted to *Anal. Chem.*

Carter, S., Morgan, M., Que Hee, S. and Buckley, T.J., "Biological Monitoring", in: *Essential Resources for Industrial Hygiene*, Harris, M.K. (Ed.), Am. Ind. Hyg. Assoc., Fairfax, VA, 2000, pp.131-139.

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Cho AK, Schmitz DA, You, Y, Rodriguez CE, Kumagai Y, Miguel AH, Eiguren A, Froines JR. Determination of Quinones/Hydroquinones in Diesel Exhaust Particles, Atmospheric PM_{2.5} and SRM 1649a. Submitted to *Environmental Science and Engineering*, 2002.

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Hinds W.C., "Parallels between community environmental health and occupational health," Commentary on Mott et al, "Wildland Forest Fire Smoke: Health Impact and Intervention Effectiveness, Hoopa, California, 1999." *Western Journal of Medicine*, 176, 162-163 (2002).

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