Final Progress Report

Southern California Education and Research Center
University of Southern California (USC)
University of California at Los Angeles (UCLA)
University of California at Irvine (UCI)

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1.) Abstract

This is a summary of activities occurring in the Southern California Education and Research Center (ERC) during the 5 year period between July 1, 1994 and June 30, 1999. The ERC has provided academic training in 4 occupational health and safety disciplines until Year 14 when the Institute for Safety and Systems Management (ISSM) at USC closed, and the Occupational Safety and Health program ended, and the continuing education program relocated to USC School of Medicine campus. There are now 3 disciplines and they are occupational medicine, industrial hygiene, and occupational health nursing. These academic programs are centered at the University of Southern California (USC), the University of California at Los Angeles (UCLA) and the University of California at Irvine (UCI) School of Medicine. Occupational Medicine Programs are at USC School of Medicine and UCI. Industrial Hygiene is at the UCLA School of Public Health and Occupational Health Nursing is at UCLA. In addition to these 3 core academic programs there is a comprehensive range of Continuing Education and outreach activities. These 4 major activities of the ERC will be more fully described in subsequent sections.

The Director of the ERC is John M. Peters, M.D., Professor and Director of the Division of Occupational and Environmental Medicine, Deputy Director is William Hinds, Sc.D., Professor of Industrial Hygiene at the UCLA School of Public Health. Directors of the component programs are John Peters, M.D. in occupational medicine at USC, Dean Baker, M.D. in occupational medicine at UCI, William Hinds, Sc.D. in industrial hygiene at UCLA, Wendie Robbins, R.N., Ph.D. in occupational health nursing at UCLA and Ruth McIntyre-Birkner in continuing education at USC.

The ERC derives considerable other support from State and federal funds. The state funded Center for Occupational and Environmental Health (COEH) directed by John Froines, Ph.D. at UCLA provides complementary funding, as does the COEH at UCI. Other research support, federal and state, provides support for scientific studies relevant to the goals of the ERC and to student training. Our ERC is characterized by interdisciplinary activities that enhance training and provide opportunities for each trainee to understand the roles and responsibilities of the other professionals in the occupational health and safety disciplines. USC, UCLA and UCI provide well equipped training facilities including classrooms, laboratories, clinical facilities, offices, extensive library services and a full range of computing capability.

2.) Significant Findings

Administrative Structure

The Center is run by the Director (John Peters, M.D.), the Deputy Director (William Hinds, Sc.D.) and the executive committee which consists of the Director's of the academic programs plus the director of Continuing Education, Ruth McIntyre-Birkner, M.B.A. This group meets at regular intervals to coordinate activities and plan interdisciplinary activities.

An external advisory committee has also been constituted to provide oversight and advice on the activities of our ERC. This group represents the important constituents of society that should be

influenced by occupational safety and health activities; government, labor, industry and academics. This group has been recently chaired by Peter Wald, M.D., Medical Director and Principal of GMG Workplace.

The academic programs are regulated by their respective universities, and where relevant the programs are certified by outside agencies for specialty training, for example, the ACGME (occupational medicine) for the occupational medicine residency programs.

Accomplishments

Professional Training - We have regularly been producing professionals who leave our programs to assume important roles in industry, government, consulting, academic and other organizations. The details of this success are provided in the individual descriptions of training programs. These accomplishments are summarized in table 1 and have been accomplished in the face of eroding federal support for training and increasing educational costs.

Continuing Education – Our active continuing education program has had a significant impact on training new individuals and providing updates and refreshers for practicing professionals. The details of these activities are described and summarized in the Continuing Education section.

Research - Our financial support for research activities has grown while support for training has been stable or decreased. The active scientific activities at USC, UCLA and UCI have helped bolster the educational programs because they help with recruitment and support of activities indirectly supporting the training mission. More money can be devoted to student support and less is needed for faculty support in a climate of heavy research activities. Exposure assessment work at UCLA and epidemiologic studies at USC are two examples. A large air pollution study at USC was begun in 1991 to determine chronic effects of air pollution in children in Southern California. The activities associated with this research project have allowed putting substance behind environmental training for physicians, industrial hygienists, and nurses. The Southern California Environmental Health Sciences Center was established at USC in 1996 to study the effects of environmental exposures on humans, and to determine host factors (genetic and other) influencing response to these exposures.

Many programs around the country have added environmental to the titles of their programs but few have developed specific programs to provide didactic training or have presented specific opportunities for students to experience this.

Faculty - We have a nationally recognized faculty at all institutions and in all training programs. The ability for faculty to serve as role models helps with recruiting and training of future leaders in occupational safety and health.

Importance of Funding - Stipend and tuition support is very important in attracting the best candidates to occupational safety and health and crucial for attracting physicians to occupational medicine. Physicians training in any other specialty area receive basic cost of living support, but this is not so for occupational medicine. Programs would rarely exist without the kind of support provided by the NIOSH ERC.

3.) Conclusions

The Southern California ERC has been a successful program. The programs have produced leaders in the 3 primary occupational safety and health disciplines and these individuals have assumed important roles in various organizations in Southern California and in other parts of the country.

The face of industry and the workforce has changed and is changing across the world, in the United States and in California. The delivery of health services and managed care have solved some problems and produced more. Despite these changes, we have adapted our training approaches and curriculum content to produce graduates ready to deal with the multitude of current problems.

The in-house occupational safety and health programs of large industry are fading. Most industry now "out source" medical care and professional services. This has resulted in a redistribution of occupational safety and health professionals. Our programs have and are continuing to adapt to this with rotations and experiences in private industry decreasing and training experiences with health care delivery organizations increasing.

Table 1
Five Year Summary of Graduates, and Continuing Education Courses
July 1, 1994 through June 30, 1999

	Year 13 1994-1995	Year 14 1995-1996	Year 15 1996-1997	Year 16 1997-1998	Year 17 1998-1999	Total
Core Academic Enrollments						
Industrial Hygiene – UCLA	25	22	23	21	20	111
Occupational Safety/Health – USC	18	6				24
HSAT – USC	16	15				31
Occupational Medicine – USC	5	3	3	5	5	21
Occupational Medicine – UCI	5	4	4	4	4	25
Occupational Health Nursing – UCLA	12	12	8	6	16	42
TOTAL	81	62	38	36	43	254
Trainees Receiving NIOSH Support						
Industrial Hygiene – UCLA	18	16	22	16	13	85
Occupational Safety/Health – USC	9	10				19
HSAT – USC	8	9				17
Occupational Medicine – USC	5	3	4	4	4	20
Occupational Medicine – UCI	1	2	4	3	4	14
Occupational Health Nursing – UCLA	5	6	7	7	7	32
TOTAL	46	46	37	30	28	187
Number of Graduates						
Industrial Hygiene – UCLA	9	9	9	9	9	45
Occupational Safety/Health – USC	7	5				12
HSAT- USC	6	5				11
Occupational Medicine – USC	3	3	0	2	3	11
Occupational Medicine – UCI	2	0	0	3	1	6
Occupational Health Nursing – UCLA	5	5	5	5	4	24
TOTAL	32	27	14	19	17	109
Continuing Education Courses						
Industrial Hygiene – UCLA	23	13	46	236	213	531
Occupational Safety/Health – USC	523	373	234	12	56	1198
Occupational Medicine – USC/UCI	15	17	129	55	213	429
Occupational Health Nursing – UCLA	142	88	121	51	63	465
Hazardous Substance Training	39	78	85	62	112	376
Other	71	19	0	6	188	185
TOTAL	813	588	615	422	746	3184

Final Progress Report

July 1, 1994 to June 30, 1999

UCLA Industrial Hygiene Program
Department of Environmental Health Sciences
UCLA School of Public Health
Los Angeles, CA 90095-1772

November 19, 1999

ERC Director: John M. Peters
Program Director: William C. Hinds

Grant Number T42/CCT910430

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1) 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, and control technology. The IHP is an established program with a stable student population of 20 - 25. 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 has been reaccredited for six more years. 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.

2) 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 has been reaccredited for six more years.
• The Program has a good track record for training and graduates and an active research program.

Research Training
• A Microtox test for ketones has been developed and validated.
• Significant exposure to CO was found during offloading of vehicles from car carrier vessels.
• For a typical half-face respirator, dust loading of the filter first increases the protection provided and then with continued loading decreases protection.
• Inhalability of particles in the 40 - 150 μm size range is lower than the criteria used for inhalable particulate matter sampling, approximately 30% instead of 50%.
• Inhalability for nose breathing is 5 - 10% for particles from 40 to 100 μm.
• A respirator performance model was developed and validated with human subjects. It predicts exposure of a worker wearing a respirator with measured fit factor and known exposure aerosol size distribution and concentration.
• Penetration model for selected pesticides and chemicals through nitrile and butyl protective gloves was developed.
• A passive sampler for aldehydes has been developed.

3) Body of Report
Major Acomplishments 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.

To better prepare industrial hygiene students to address the ever-increasing incidence of cumulative trauma disorders (CTDs), the UCLA Industrial Hygiene Program has set up a laboratory for both teaching and research in occupational ergonomics.

The IH Program completed its first sixth year cycle as a fully accredited program. It has been re-accredited for another six years starting 9/99. It is accredited by ABET/RAC, Accreditation Board for Engineering and Technology/Related Accreditation Commission, the accrediting board for industrial hygiene programs. The program is one of 25 programs in the US accredited by ABET/RAC.

We received $15,000 from the Graduate Division as a one-time supplement to the NIOSH stipends for doctoral students.

A major revision of the Departmental curriculum change was implemented in 1998-99 to accommodate the new Department core courses, Fundamentals of Environmental Health Sciences, EHS 200A and 200B. This involved minor changes to the IH curriculum.

A proposal was submitted to NIOSH for a Safety training grant as part of the Southern California ERC. This will enhance course offerings in the safety area for industrial hygiene students.

The Program has acquired a HI3000 Broadband isotropic field strength meter, HI-3604 ELF Survey Meter, and HI-3627 ELF Magnetic Field Meter for measurement of electrical and magnetic fields. We have also acquired a Harvard syringe pump, a gas bag filling container for the generation of calibration concentrations, a DataRAM for direct reading of particulate concentrations, and a Cahn electrobalance.

The program was awarded a three-year NIOSH Hazardous Substances Academic Training (HSAT) grant starting in July 1994. This was renewed for five more years starting in July 1998. 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 three of the six designated courses to fulfill the minor. Twenty-three industrial hygiene students have been supported by the HSAT training grant since 1994. Eighteen IH students have taken the 40-hour HAZWOPER training course as part of this program.

The Atlantic Richfield Company (ARCO) donated 55 pieces of used industrial hygiene sampling, monitoring, and calibration equipment to our Program. We also received a donation of surplus equipment from The State Compensation Insurance Fund. We were able to transfer surplus teaching and research equipment from the now closed safety program at USC to the UCLA IH Program..

We have established permanent internship opportunities with CalOSHA. Four industrial hygiene students have participated since 1997.

A one year program of courses leading to a MPH degree for UCLA/USC and UCI Occupational Medicine Residents has been established in the Department of Environmental Health Sciences.

The UCLA Industrial Hygiene Program was a DOE host campus for their DOE Industrial Hygiene Fellowship Program until that program was discontinued. One student was supported through this fellowship program.

Fifteen students presented their research at platform or poster sessions at1995-1998 AICHE Conferences.

We have continued the series of informal Industrial Hygiene Student-Faculty meetings to enhance student-faculty communications on curricula and other issues.

IH students have continued the Industrial Hygiene Student Association with elected officers and formal recognition by the UCLA campus. The Association represents the industrial hygiene

students for various School and Program issues.

Honors and Awards
Dr. Hinds and Dr. Que Hee were elected to Fellow Membership status in the American Industrial Hygiene Association in 1994 and 1999. Dr. Que Hee was awarded the Outstanding Faculty Award, Health Careers Opportunity Program, UCLA School of Public Health, 1994. Dr. Hinds was awarded the 1996 Technical Achievement Award by the Southern California Section of the American Industrial Hygiene Association. Dr. Hinds was awarded Outstanding Teaching Award in EHS by the Public Health Student Association in 1997 and 1998.

Masters student Virginie Leenknecht was awarded the 3M American Industrial Hygiene Scholarship at the AIHCE in Dallas, TX. She also received the Ruth Richards award and the Delta Omega Society award. Doctoral student Yu-Wen Lin received the Wellness award and the Goerke award for the best graduating School of Public Health doctoral student in 1997 and masters student Peng-Cheng Sung received the Ray Goodman award in 1997. IH students Andrea Minea, Celia Laio, Barbara Kim and Bart Ashley were named outstanding graduate students by the UCLA School of Public Health Delta Omega Society and Alumni Association. IH student Jenny Wang received the first Tony Norton Memorial Fellowship Award in June 1996. Five students, Rania Sabty, Aaron Davenport, Bart Ashley, C. Renee Jones, and Gerald Pineda received the Outstanding Graduate Student Award for 1994, 1995, 1996, 1998, and 1999 from the Southern California Section of the American Industrial Hygiene Association

Twenty-one additional full-time industrial hygiene students were not supported by the ERC. Fourteen of these students graduated during the reporting period.

Curriculum Changes
An introductory course in Occupational Ergonomics (EHS 298A) has been developed and given in the Spring quarter of 1993.

EHS 258, Identification and Analysis of Hazardous Wastes, has been increased to four units and now includes a donning/doffing session of PPE as well as a field trip to the UCLA waste containment facility.

EHS 254, Health Hazards of Industrial Processes, has been expanded to include a field trip to a hazardous waste processing facility.

Three new courses were offered: EHS 259D Introduction to Occupational Safety and a revamped two course sequence 410A and 410B Instrumental Methods in Environmental Sciences.

A new course was offered in Spring Quarter 1996, Environmental Health Sciences 252G, Industrial and Environmental Hygiene Assessment. This course includes one lecture session, a walk-through, and a field sampling session every two weeks.

The revised MS and MPH industrial hygiene curricula were implemented in 1995-96. Three courses, previously required, are no longer required, but are included as menu options. The

menu option requires a student to take three courses (eight units) from a list of ten courses. One of the three courses must be from a subset of three courses. This gives our curriculum greater flexibility to meet differing student career objectives.

Research Training (Doctoral Level) (Progress Report Summary)
The focus of our research training program will continue to be 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 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 and plans to acquire an 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. Also, included is the Ergonomic Research Laboratory under the direction of Dr. Liu.

Enrollment
During the period June 1, 1994 to June 1, 1999 there were 63 full time students in the Industrial Hygiene Program. Of these 22 were MPH, 33 were MS, and eight were PhD candidates. Forty-five were supported by the NIOSH ERC. Thirty-eight have graduated.

Graduates
The placement of graduates breaks down as follows: five placed with Federal or State OSHA agencies, 11 with private industry, seven with consulting companies, four went on to graduate school, four with local health departments or other government agencies, three in research or education positions, and current positions for four are not known. Twenty-five students have done internships with private industry or government agencies.

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 been reaccredited for six more years. 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.

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Occupational Medicine (USC)

The 2 year residency program is accredited by the Accreditation Council for Graduate Medical Education (Occupational Medicine) for eligibility for ABPM examination in occupational medicine.

Goals and Objectives of the Occupational Medicine Residency Program.

Rationale - There is a severe shortage of physicians with training in occupational and environmental medicine. There has been a growing recognition by private industry, the government, universities, labor unions, hospitals, clinics and other health organizations of the need for physicians with this training. Many occupational health hazards go unrecognized because of the lack of trained physicians. First of all, occupational diseases need to be recognized and then they can be controlled or eliminated. Traditional medical training does not prepare physicians for this role. The usual physician is trained to deal with disease in patients one at a time. Quantitative approaches must be followed for the earliest detection of disease in groups. Therefore our program relies heavily on quantitative approaches (biostatistics and epidemiology) to be applied upon a background knowledge of industrial processes, medicine and toxicology.

Academic or Professional Content.

Clinical Medicine - We believe that physicians trained in Occupational Medicine should be clinically competent. Although the American Board of Preventive Medicine (Occupational Medicine) currently requires only one year of clinical experience, we encourage persons contemplating training in Occupational Medicine to take more medical training. In addition to general clinical competence, physicians must be able to: distinguish occupational disease from non-occupational disease; initiate and supervise treatment of occupational disease such as cyanide, lead, or carbon monoxide poisoning; evaluate disability and pre-employment health status; and design and execute surveillance programs for occupational and non-occupational problems. These involve both knowledge of record-keeping systems and the ability to determine the usefulness of the given clinical tool as a screening or surveillance procedure.

Epidemiology and Biostatistics - Educational programs for physicians in Occupational Medicine rely heavily on a sound foundation in epidemiology and biostatistics. Too much of the practice in this field in the past has relied on collection of cases, assumptions about exposures, and educated guesswork. These methods need not be condemned, but should be recognized as primitive in contrast to knowledge, which grows out of the sound use of quantitative approaches embodying epidemiological measurements. In the last twenty years great strides have been made in developing the disciplines of chronic disease epidemiology. It is essential that specialists in the field of Occupational Medicine understand and apply these important tools. The extent of training and background in this area depends on the anticipated professional roles i.e., those residents with an interest in research may emphasize techniques more than those who are going to play other roles. All of the trained individuals, however, need to appreciate how epidemiology and statistics are used for primary research, problem evaluation, program development and program evaluation. The emphasis is on providing useful skills, which can be applied in daily

practice.

Toxicology - Along with epidemiology and biostatistics, a firm grasp of the principles of toxicology is fundamental. The objective is not to produce toxicologists, but rather to provide a working knowledge of the field. The results of toxicological investigations play a major role in determining occupational health practices since so little data on human disease are currently available. Residents must understand the purposes and limitations of evaluating the toxic effects of chemical substances and in particular their mutagenic or carcinogenic activity. Properly done and interpreted, toxicological studies provide important opportunities to predict potential human hazards when studies of human populations are not available.

Industrial Hygiene - The skills and knowledge represented by this field are essential for comprehensive evaluation and control of workplace hazards. For a physician to work in an industrial environment without the continuing advice and service of an industrial hygienist creates a circumstance in which workers' health is unlikely to be protected adequately. A physician/industrial hygienist team is generally indispensable. We believe that physicians in Occupational Medicine must be able to recognize the potential hazards associated with common industrial processes; use quantitative measurement techniques to perform preliminary evaluation and hazard identification; understand and appreciate the many variations and exposure types and circumstances, the possibilities and limitations of measurements, and the appropriate application of quick vs. comprehensive evaluations; be sensitive to the possibilities and shortcomings of control maneuvers; recognize appropriate use of exposure control methods such as work practices, workplace design, and personal protection; and examine critically any major control efforts and their ongoing maintenance.

Safety and Ergonomics - Physicians in Occupational Medicine must understand the importance of the proper use of machines and hand tools; the hazards of moving, handling, and storing materials; basic electrical codes and fire prevention techniques; and effective use of personal protective equipment. Beyond this, the merger of safety and industrial hygiene is expected to improve the practice of each physician. For example, an accident due to slowed reaction time needs to be evaluated using industrial hygiene approaches to determine the contributions of hazardous exposures. On the other hand, solutions to exposure hazards may increase the risk of injury. For example, hearing protection may reduce the effectiveness of voice communication.

An understanding of the principles of ergonomics is essential to planning safe and healthy work environments. Physicians in Occupational Medicine must understand job design principles to fit the machine to the worker; evaluate human factor problems in the workplace such as fatigue, work stress and work strain; and provide proper solutions to these problems. The physician has a responsibility to participate in the design of a job to fit the worker and select a worker to fit the job, thereby reduce accidents and increasing job acceptance and job productivity.

Administration - Many physicians are employed by large organizations and have supervisory responsibilities for both professional and non-professional personnel. As a consequence, physicians in Occupational Medicine need to perform a wide range of managerial and administrative functions to carry out their professional roles successfully. Therefore, the objective of the administrative component will be to provide training in managerial and

administrative techniques without losing sight of the fact that the decisive factor in determining the professional success of physicians in Occupational Medicine should be their technical and scientific expertise.

Policy Issues - Physicians working in Occupational Medicine frequently operate in an environment of economic, legal and political conflict. They often discover that their professional judgement is constrained by pressures from others whose major concerns may be economic or political. Physicians can perform their tasks better with an understanding of these pressures and an ability to evaluate occupational health and safety programs in light of conflicting objectives. Decisions ranging from selecting a specific method to reduce a hazard in one plant to choosing the appropriate exposure level for federal standard, all require an understanding of both technical and economic issues. All too often residency training programs have excluded the latter from their curricula. Physicians without training in policy analysis are less effective in transforming their knowledge into appropriate action.

Prevention - While the primary objective of the physician in Occupational Medicine is to prevent ill effects resulting from work, we must not lose sight of the many opportunities to establish other prevention programs. Programs for smoking cessation, health promotion, counseling, alcoholism detection and rehabilitation, diet control, etc., all have an important place in the industrial setting. These programs in prevention are all facilitated when mutual trust and cooperation exists between the workers, the management and the university.

Residency Program Curriculum

The curriculum leading to a master's degree and board eligibility in Occupational Medicine is presented over a two-year period and consists of courses, clinics, fieldwork, projects, and seminars/rounds. The first year is largely didactic work, the second year is largely field experience and project oriented. The residents attend occupational medicine clinics throughout the two years. Regular seminars and rounds are presented.

Course work. Courses include biostatistics, epidemiology, toxicology, industrial hygiene and safety, administration, policy and occupational health problems.

Clinics - Residents see patient's half day per week under the supervision of our faculty and do associated reading and library work in order to evaluate the cases seen. Other clinical assignments are made depending on the interest and needs of the resident.

Projects - The objectives of the project are:

* To introduce the resident to problem identification and solution.
* To introduce the resident to applied research techniques in Occupational Medicine.
* To provide opportunity to use didactic information learned the first year.
* To provide the resident with an opportunity to learn to use a computer on occupational health related activities.
* To increase the information base for occupational medicine.
* To provide the resident with an opportunity for public presentation.

* To provide the resident with an opportunity to write a scientific paper.

Each resident will be required to produce one paper suitable for publication. This effort will require the use of the quantitative techniques learned during the first year. A potential problem will need to be identified, data identified or gathered, data analyzed and a report written. The nature of the project can take many forms: a health hazard evaluation can be conducted or a small research project can be undertaken. With the research activities of the faculty, many projects will be available to provide the resident the opportunity of an in-depth experience on a relevant question. In addition to the paper, the resident will present his findings at the monthly seminar.

Field Experience

The objectives of field experience are:

* To familiarize the residents with types of Occupational Medical problems and programs extant.
* To familiarize residents with coverage (or lack thereof) of Occupational Medical programs in small and large industry.
* To acquaint the residents with governmental activities in Occupational Health:
  - To view compliance activities.
  - To see and participate in hazard evaluations.
  - To observe standard-setting activities.
* To understand union-company interactions including collective bargaining especially as it relates to Occupational Medicine.
* To understand union organization and motivations.
* To provide the resident with the opportunity of working with actual occupational health problems and to participate in their definition and solution.

Field experiences include assignments with California OSHA, City of Los Angeles, Kaiser-Permanente, private industry and labor organizations.

Faculty

University of So. California (USC)

John M. Peters, M.D., Sc.D.
Professor and Director
Division of Occupational and
Environmental Medicine

Edward L. Avol, M.S.
Associate Professor
Division of Occupational and
Environmental Medicine

University of Cal. Los Angeles (UCLA)

John R. Froines, Ph.D.
Professor
Director, Southern California
Occupational Health Center

Philip I. Harber, M.D.
Professor of Medicine
Pulmonary Medicine

University of Southern California (USC)

Frank D. Gilliland, M.D, Ph.D.
Associate Professor
Division of Occupational and
Environmental Medicine

Rob McConnell, M.D.
Associate Professor
Division of Occupational and
Environmental Medicine

Robert L. Goldberg, M.D., M.S.O.M.
Clinical Associate Professor
Preventive Medicine

Paul Papanek, M.D.
Clinical Associate Professor
Preventive Medicine

Peter Wald, M.D., M.P.H.
Clinical Associate Professor
Preventive Medicine

University of California, Los Angeles (UCLA)

William C. Hinds, Sc.D.
Professor of Environmental
Health Sciences

Wen-Chen Victor Liu, Ph.D.
Assistant Professor in Residence
Environmental Health Sciences

Shane Que Hee, Ph.D.
Professor
Environmental Health Sciences

Summary

This 2-year residency program in Occupational Medicine prepares qualified applicants for leadership roles in private industry, government, academia, organized labor or private medicine. Those physicians with interest in occupational safety and health problems and an orientation toward prevention should find this a very attractive program.

Training Record

Trainee Graduates (July 1995 through June 1999)

Ardalan, Mozhgan '99 12335 Santa Monica Blvd., #315 Los Angeles, CA 90025 *Medical Director, Rancho Los Amigos*	Sergile, Suzanne '99 7632 Hollywood Blvd., #1 Los Angeles, CA 90046 *Medical Review Officer, National Medical Review*	Taber, Robert '99 2519 Huntington Lane, #A Redondo Beach, CA 90278 *Occupational Medicine Consultant, Santa Marta Hospital*
Head, Kathy '98 11163 Corte Cangrejo San Diego, CA 92130 *Staff Physician, Sharp, Rees-Stealy Medical Group*	Iles, Janet '98 56 E. Boulder Creek Road Simi Valley, CA 93065 *Occupational Medicine Staff Physician, Kaiser-Permanente*	Dubose, Anthony '96 2110 W. Middlefield Road, Mountain View, CA 94043 *Staff Physician, Corky Hull Medical Associates*
Grace, Irene '96 16261 Honolulu Lane Huntington Beach, CA 92649 *Medical Director, Fullerton Placentia Medical Center* *Placentia, CA*	Jackson, Bernice '96 867 5th Avenue Los Angeles, CA 90005 *Staff Physician, City of Los Angeles*	Chan, Wesley '95 11 Mountainbrook Irvine, CA 92720 *Staff Physician, GMG Workplace*
Gliederer, Franz '95 1543 Glendon Ave. Los Angeles, CA 90024 *Staff Physician and Consultant, St. Joseph's Medical Center*	Thoene, Joseph '95 3084 W. Corte Olivia Tucson, AZ 85741 *Staff Physician, Sharp, Rees-Stealy Medical Group*	

Research Projects

Research projects are required as part of the MS program. Completed research projects are as follows:

USC Occupational Health-Care Program -an occupational health and safety program to reduce and prevent the occurrence of occupationally acquired injuries and illnesses, to develop an awareness of health alterations due to occupational exposures and a strategy for the treatment and management occupational illnesses and injuries.

Work Environment Survey – Surveys describing a series or work environment surveys conducted by City of Los Angeles, Occupational Health Services Division (OHSD) of the Personnel Department in response to complaints of skin rashes at the Pacific Police Station.

Respiratory Effects of MTBE – The medical literature was reviewed to determine the possible respiratory health effects of MTBE as part of a state-wide review of the toxicology of MTBE. The study lead to a ban on the use of this toxic gasoline additive.

Occupational Medicine Residency University of California (UCI)

Summary

The University of California, Irvine Occupational Medicine Residency Program was established in 1976 and has trained over 40 physicians. Graduates of the program include a core of the practicing occupational medicine specialists in Southern California, as well as leaders in corporate occupational medicine and public health practice. A strength of the program is our long-term collaboration with occupational medicine practitioners and programs in the region. This collaboration provides a rich source of expertise and training experiences for our residents. The program emphasizes leadership training for occupational medicine practice by providing strong clinical and didactic core training, a large number of practicum field training opportunities, and a rigorous research training experience.

The program has trained an average of four residents per year and graduated two residents per year. The residency has been able to fill all of the positions we offer, which is determined primarily by the availability of resident stipend support. The program has attracted outstanding trainees and all of our graduates have obtained desirable positions in occupational practices or academics. The program has been continuously strengthened through the addition of research faculty, identification of new practicum training sites, improved training in industrial hygiene and safety, and emphasis on providing work site visits and interdisciplinary interaction.

Organization. The Occupational Medicine Residency Program is a two year program sponsored by the UCI Center for Occupational and Environmental Health (COEH) and is based in the Division of Occupational and Environmental Medicine, Department of Medicine, UCI College of Medicine. The residency program director is Dr. Dean Baker, Director of the UCI COEH. Administrative support is provided by the College of Medicine Residency Program Office and the Department of Medicine. The program is reviewed internally by the UCI Committee on Graduate Medical Education and is fully accredited by the Accreditation Council for Graduate Medical Education (ACGME). The residency includes a large clinical faculty, and academic degree programs, and practicum field sites.

The teaching programs during the academic year include the MS Degree Program in Environmental Toxicology, UCI College of Medicine; the MS Degree Program in Environmental Health Science and Policy, UCI School of Social Ecology; and the MPH Degree Program in Environmental Health Sciences, UCLA School of Public Health.

Field training sites during the practicum year include Mobil Oil; Steelcase; Cal-OSHA, State of California Department of Industrial Relations; County of Orange Employee Health Service; Kaiser Permamente; Sharp Rees-Stealy Medical Group; the UCSD Occupational and Environmental Medicine Program; and the Southern California Regional Poison Control Program. These include: M. Joseph Fedoruk, M.D.,Constantine Gean, M.D., Loretta Lee, M.D., Frederick Fung, M.D., Richard Clark, M.D., John Howard, M.D., William Hughson, M.D., Saralyn Williams, M.D., Lester Sacks, M.D.,Richard Pitts, D.O.

Faculty. The core faculty in the UCI Center for Occupational and Environmental Health is multi-disciplinary and highly qualified. Dr. Baker is a physician epidemiologist with many years of research and teaching experience. Dr. M. Joseph Fedoruk and Dr. Elliott Kornhauser are experienced physicians and outstanding clinical teachers. Dr. Peter Schnall is a research-oriented physician epidemiologist who is an expert on occupational stress. Ralph Allan, J.D., C.I.H. is an industrial hygienist with training in law who teaches industrial hygiene, exposure and regulatory and legal aspects of occupational health. Mary Koebler, R.N., COHN-S, contributes the perspective of occupational health nursing in our clinical and didactic training. Dr. Stephen Bondy and Dr. Robert Phalen provide training in neurotoxicology and respiratory toxicology, respectively. Closely affiliated faculty include Drs. Ronald Shank and Michael Kleinman (toxicology) in the Department of Community and Environmental Medicine; Drs. Jonathon Ericson and John Whitely (environmental health) in the School of Social Ecology; and Drs. Ralph Delfino and Hoda Anton-Culver (cancer and environmental epidemiology) in the Division of Epidemiology.

The UCI residency program has outstanding volunteer clinical faculty. These faculty contribute significantly to the residency program by serving as principal preceptors at the affiliated training sites mentioned above. The preceptor at each site is a board certified physician in occupational medicine. The clinical faculty have academic appointment in the UCI Department of Medicine.

The faculty is involved in local, regional, national, and international occupational and environmental medicine activities. Many of the faculty have appointed or elected to positions in prominent national and international professional organizations. The faculty includes a multi-disciplinary mix of faculty with a balance between principal interests in research, clinical occupational medicine, and professional practice.

Training Program. The Occupational medicine residency is designed as a two year training experience consisting of the academic phase and the practicum phase.

The UCI residency provides a choice of three degree programs for the academic phase - two Master of Science (MS) degree programs at UCI and the MPH degree program at UCLA. We offer a choice of degree programs because it provides flexibility in addressing the residents' education objectives. The MS degree programs provide in-depth training in toxicology or environmental health while satisfying all requirements for preventive medicine and occupational medicine. They also allow for greater participation in the COEH training activities during the academic year since the residents are at UCI. Some UCI residents attend the MPH program at UCLA because they would like a more traditional public health training. The teaching programs during the academic year include the MS Degree Program in Environmental Toxicology, UCI College of Medicine; the MS Degree Program in Environmental Health Science and Policy, UCI School of Social Ecology; and the MPH Degree Program in Environmental Health Sciences, UCLA School of Public Health. The UCLA MPH program is the same as that used for the academic year in the UCLA/USC occupational medicine residency program. The MS degree satisfies the MPH equivalent and Preventive Medicine requirements.

Throughout the residency required core training activities include the clinical case conference, didactic seminar, journal club, worksite visits, and the COEH occupational and environmental

medicine clinic. Residents come to the COEH core training activities on a weekly basis throughout both years of the residency. Residents in the academic year participate in the seminars over the summer and during the academic year if their class schedules permit. The clinical case conference is held every week, while the didactic seminar and journal club are held bi-weekly on alternate weeks.

Although the goal of the residency is to prepare physicians for the comprehensive practice of occupational medicine, we believe it is important for the residents to gain an appreciation for the research process. In fact, research is an integral component of the residency program in that the academic year programs at UCI require research leading to a thesis. During the practicum phase, residents may extend the research they began in the academic phase or they may undertake new projects. These projects may develop from the field site rotations. The research experience is designed to provide knowledge, skills, and an appreciation of research without detracting from the residents' core training in comprehensive occupational and environmental medicine practice.

Residents are expected to complete an individual project, which generally consists of collecting and analyzing clinical, toxicological or epidemiological data. The resident must prepare a report on the project to be approved by the residency program director. This project may be based on the thesis research activity required for the Masters program during the academic phase, although residents often undertake longer-term projects requiring time during the practicum phase.

A research project is still required and the following are examples of research opportunities with program faculty.

- Occupational and cancer epidemiology (analysis of epidemiologic data) - Division of Epidemiology with Drs. Delfino, Semenza, or Anton-Culver
- Occupational and environmental epidemiology - Dr. Baker
- Experimental toxicology - Department of Community and Environmental Medicine with Drs. Bondy, Phalen, Kleinman, or Shank

Trainees. Program graduates include a core of the practicing occupational medicine specialists in the Southern California region, as well as leaders in corporate occupational medicine and public health practice. Because the program does not provide a clinical year, we require that entering residents have completed at least one year in a clinical residency program. The program has trained an average of four residents per year since re-joining the ERC in 1995. The residency has been able to fill all of the positions we offer, which is determined primarily by the availability of resident stipend support. The program has attracted outstanding trainees and all of our graduates have obtained desirable positions in occupational medicine practices or academics. The residency has been reviewed by the ACGME and received full accreditation for a five year period through the year 2003.

Summary of Program Progress

Organization. The academic degree program at the San Diego State University, MPH is no longer offered based on our ongoing program evaluation and advice from our Residency Advisory Committee. The MS degree program in Environmental Toxicology is the most common training track chosen by residents.

Practicum field site rotations at Arco and Unocal have been dropped due to the fact that the sites have ceased to exist. We have added field training sites at Mobil, Steelcase, Kaiser Permanente, Southern California Regional Poison Control Program, and UCSD Occupational and Environmental Medicine Program. In addition, the Division of Occupational and Environmental Medicine has established a occupational medicine clinical services. Residents have begun rotating through these training sites.

Faculty. The program leadership has been stable; Dr. Baker remains the program director. The core program faculty has grown during the past year. The core physician faculty includes Dr. Baker, Dr. M. Joseph Fedoruk, Dr. Elliott Kornhauser, Dr. Ulrike Luderer, and Dr. Peter Schnall. Dr. Fedoruk has expanded his faculty time at UCI during the last year. Dr. Kornhauser joined the faculty after completing the residency program last year. He is acting medical director of the UCI Medical Center clinic. He also precepts one day a week at the COEH clinic. Dr. Luderer joined the faculty as a full-time faculty member in August 1999. She completed residency training in internal medicine and occupational medicine, as well as graduate training in reproductive endocrinology and reproductive toxicology. She will provide both clinical and research training for the residents.

Clinical - Dr. M. Joseph Fedoruk, Dr. Elliott Kornhauser and Dr. Ulrike Luderer
Research - Dr. Ulrike Luderer, Dr. Dean Baker, and Dr. Peter Schnall
Industrial Hygiene -Ralph Allan, JD, CIH.

Training Program. The goal of the residency is to prepare residents for the comprehensive practice of occupational medicine in a variety of settings including clinical practices, corporate medical departments, academia, and public health programs. The program provides a range of training opportunities so the residents tailor their training to address their educational objectives, while ensuring that each resident receives solid training in core areas. Residents in the academic year enroll in the MS degree program in toxicology or environmental health at UCI or in the UCLA School of Public Health MPH degree program. During the practicum year, residents spend most their time in field site rotations. The residency provides practicum training in industrial and service sector occupational medicine programs, as well as in comprehensive occupational medical practices and regulatory practice. Within these rotations, residents are exposed to all aspects of occupational medicine practice. There is substantial opportunity for interactions with nursing, industrial hygiene, and safety personnel. Throughout the academic and practicum years, residents receive ongoing training at the UCI COEH consisting of supervised clinic sessions, clinical case conference, didactics seminars, and journal club. Residents must also complete an individual research project during the residency. This intensive academic, clinical, and practicum training prepares our graduates to serve as leaders in occupational medicine. The residents spend approximately three quarters of their time in field site rotations

and one quarter time on core an research.

We have continued to enhance industrial hygiene, epidemiology, and occupational disease training by expanding the orientation and initial training program for incoming residents. New residents join the program in August and receive intensive training in these topics before beginning their masters' degree programs in late September. This initial training also includes clinical training and several work site visits.

Research. A research project is still required and the following are examples of residents' research projects during the past few years; most residents do projects as part of the MS degree program, but the MPH students do an equivalent as a resident project.

1) Predicting Factors for the Surgical Treatment of Carpal Tunnel Sydrome (MPH Thesis)
2) Application of Quality Management Training in the Prevention of Occupational Injury (Practicum phase project)
3) Medical Provider Choice and Workers Compensation Costs in Hotel Operating Company in Hawaii (Practicum phase project)
4) Trends in Agricultural Organophosphate Poisoning in California Following Changes in Regulations (MS Thesis)
5) Occupational Dermatitis in a Guitar Manufacturing Facility (MS Thesis)
6) Assessment of the Systems I Place at the UCI Medical Center for Treating and Managing Injured Employees and Recommendations for the Future (Practicum Phase project)

Trainees.
UCI Graduates - July 1994 through June 1999

1993 - 1995	Craig M. Uejo, MD, MPH
1994-1995	Sarath Gunatilake, MD, Dr.PH
	Vern Sasaki, MD, MPH
1994-1996	Sunita Lohiya, MD (did not complete program due to health problems/back injury)
1996-1998	Elliott Kornhauser, MD, MPH
	Jennifer Javors, MD, MS
1997-1998	Stephen Munday, MD, MPH
1997-1999	Peter Low, MD, MS
1998-2000	Ellyn McIntosh, MD MPH
	Kevin Walters, MD, MS
	Douglas Thierer, DO, MS

Final Progress Report

July 1, 1994 to June 30, 1999

UCLA Occupational Health Nursing Program
School of Nursing
Los Angeles, CA 90095-6919

November 30, 1999

Principal Investigator: John M. Peters
Program Directors: Linda K. Glazner / Mary Ann Lewis (Interim) / Wendie A. Robbins

Grant Number: T42/CCT910430

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Abstract

The Occupational Health Nursing Program at UCLA provides advanced practice graduate education for nurses to prepare them for specialty practice roles, research roles, and leadership roles in occupational and environmental health. The goal of the program is to produce advanced practice nurses who can respond to the national and regional need for qualified occupational and environmental health nursing specialists. The training is multidisciplinary and includes content in industrial hygiene, safety, ergonomics, research, epidemiology, toxicology, and occupational medicine. Although the goals of the program have remained constant over the past five years, the structure and leadership in the program has undergone major change beginning Fall 1997. These changes are driven by recommendations made by the 1997 NIOSH ERC Special Emphasis Panel, as well as by the changing dynamics and diversity in today's workplace.

Major Accomplishments and Changes

Leadership

The Director of the Occupational Health Nursing Program was Dr. Linda K. Galzner through July 1996. From 1996 through Fall 1997, the Interim Director was Dr. Mary Ann Lewis. Beginning Fall 1997, Dr. Wendie A. Robbins became Director of the Occupational Health Nursing Program. The program changed name to the Occupational and Environmental Health Nursing Program in 1998. In 1998, Dr. Donna Mc-Neese Smith joined as faculty in the Nursing Administration of Occupational Health Programs track.

Academic Training

The occupational health nursing specialty is a two-year program of study earning a Masters degrees in Nursing (M.S.N.). The academic objective of the Occupational Health Nursing Program is to provide advanced practice graduate education for nurses to prepare them for specialty practice roles, research roles, and leadership roles in occupational and environmental health. The UCLA Occupational Health Nursing Program is the only graduate level program in occupational health nursing in Southern California.

In response to the growing need for occupational health specialists trained in administration and evaluation of occupational health programs, we added a new track for specialization within our Occupational Health Nursing Program during this five-year reporting period. The track is 'Nursing Administration of Occupational Health Programs' which began Fall 1997. Students entering our Occupational Health Nursing Program choose a concentration in either nursing administration of occupational health programs or advanced practice nurse practitioner. Our first student in the administration track entered Fall 1997 and graduated Spring 1999. This student now runs a successful 'on-line' workers compensation management program in the State of California. In Fall of 1998, we enrolled two students in the administration program, and in Fall of 1999 we enrolled another two. In June of 1999, grant monies were awarded to the UCLA School of Nursing to offer the school's Nursing Administration courses 'on-line.' It is anticipated that the administration program (including much of the coursework for our students in the Nursing Administration of Occupational Health Programs) will come on-line by Fall 2000.

In response to recommendations by the 1997 NIOSH ERC Special Emphasis Panel, we changed our nurse practitioner preparation in the Occupational Health Nursing Program from Family Nurse Practitioner to Adult Nurse Practitioner. This has allowed us to slim down the number of required course credits by deleting pediatric content. 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 masters degree program has continued to be approved by the California Board of Nursing, National League for Nursing, and the University Academic Senate (Western Association of Schools and Colleges) during the five-year reporting period. All graduates of the program have a foundation for future doctoral study.

The curriculum has developed over the reporting period to include more content specific to the occupational health specialty. We now offer three courses for occupational health nursing students instead of one:

N213A/C113A Occupational Health Nursing Role and Theory. Introduction to the multidisciplinary occupational health environment including work settings, occupational health nursing scope and standards of practice, legal and regulatory issues that affect occupational health nursing.

N213B/C113B Occupational Health Programs. Program planning, evaluation, and management of occupational health programs. Includes analysis of individual leadership styles and management concepts. Assessment of economic, political, and other factors that affect occupational health and safety.

N213/C113C Health Assessment, Research, and Health Promotion in Occupational Health. Clinical practice issues in Occupational Health Nursing including adult workforce health issues, adult workforce health assessment and special populations at risk, and health promotion and research in occupational health.

In addition, beginning Fall 1998, our students began participating in the core course offered by the Environmental Health Sciences Department, UCLA School of Public Health. The occupational health nursing students now sit for course content in physical, chemical, and biological agents with the industrial and environmental health students.

Enrollment and Graduates

During the enrollment period, 24 students graduated from the Occupational Health Nursing Program. Eighteen of these students were supported in part by the NIOSH ERC.

All graduates who sought employment in occupational health settings were employed in occupational health. A number of graduates who were prepared as Family Nurse Practitioners desired and continue to work in family health settings. One 1998 graduate has expressed a desire to return to the UCLA School of Nursing for doctoral work and has begun the application process.

Publications

During the reporting period, 14 peer reviewed journal articles were authored and published by faculty and graduates of the Occupational Health Nursing Program.

Conclusions

The UCLA Occupational Health Nursing Program has undergone major changes during this reporting period. We have seriously considered all the recommendations made by the 1997 NIOSH ERC Special Emphasis Panel and have been able to operationalize the majority of suggestions. We see ourselves in a period of growth following major change. We intend to monitor and evaluate the program changes over the next few years. In this way we plan to strengthen the Occupational and Environmental Health Nursing Program.

Final Progress Report

July 1, 1994 through June 30, 1999

Program in Continuing Education
Division of Occupational and Environmental Health
USC School of Medicine
1540 Alcazar Street, Suite 236
Los Angeles, California 90033

November 26, 1999

ERC Director: John M. Peters, M.D.
Program Director: John M. Peters, M.D.; Associate Director: Ruth K. Birkner

Grant Number T42/CCT910430

Table of Contents Page

1) Abstract

Continuing education is the visible link between the academic applied research community and the practicing community. Through Continuing Education, the Southern California ERC reaches out to regional physicians, nurses, industrial hygienists, safety engineers and other occupational safety and health professionals, paraprofessionals and technicians, including personnel from labor-management health and safety committees.

Over the past five-year grant period, the Program in Continuing Education achieved its goals; however, it experienced a series of structural and administrative changes. At the beginning of Year 14 the Institute for Systems and Safety Management (ISSM) at USC closed and the CE Director, Ramona Cayuela, retired. At that time, the Program was

Environmental Health on the USC Medical School campus. Ms. Ruth Birkner was hired part-time in July, 1997, to restructure and rebuild the program.

Over the life of this Program, its overall goal has been to achieve effective prevention of many occupational health and safety hazards through education and training.

2) Significant Findings

Southern California, a region of 13 million people, has the largest concentration of high-technology industries in the world and extensive aerospace, manufacturing, petroleum and service industries. This concentration creates a regional need for continuing education.

In needs assessments conducted during this period, we recognized that as the workplace has changed occupational health and safety professionals' responsibilities have broadened to include environmental issues. This requires broader-based curriculum to help professionals stay abreast of scientific and technologic advances in this multidisciplinary, global field.

To meet the challenges of the "new economy," multidiscipline programs must be offered that systematically cover emerging workplace concerns -- e.g., ergonomics. This issue, and others like it, is not limited to one field and affects a broad range of occupational health and safety specialists—occupational medicine and primary care physicians, occupational health nurses, industrial hygienists, safety specialists, labor and management.

The portfolio of CE programs has changed with the faculty strengths, needs and interests. The Process Safety Management and Health and Safety Certificate programs were dropped due to low enrollment. No active CE programs, originally part of the NIOSH ERC, were transferred to the Medical School when the Institute closed.

Continuing education programs were offered throughout Region IX, but primarily in the greater Los Angeles area—at USC, UCLA, UCI, UC Santa Barbara and community colleges. This departure from having dedicated classrooms on USC's main campus has been well received by the community.

Over this reporting period, this ERC has allowed graduate students to enroll in CE courses for the cost of materials. Many have chosen to do so, especially in Pulmonary Function Testing and the CAOHC-approved Hearing Conservation Programs.

Until June, 1997, USC worked cooperatively with the Northern California ERC to conduct pesticide training through a joint Hazardous Substance Training Grant. With the closure of ISSM, this resource was no longer available. Ms. Birkner applied for and received a new HST grant for the ERC effective July 1, 1999.

3) Body of Report

Major accomplishments and numbers

Over this five-year reporting period, the Program in Continuing Education offered 151 programs with an enrollment total of 3,184—an average of 21 students per course. Programs were of high quality and of practical application to the attendees.

CE Course Students	Year 13 1994-1995	Year 14 1995-1996	Year 15 1996-1997	Year 16 1997-1998	Year 17 1998-1999	Total
Industrial Hygiene	23	13	46	236	213	531
Occup. Safety	523	373	234	12	56	1,198
Occup. Medicine	15	17	129	55	213	429
OHN	142	88	121	51	63	465
Hazardous Substance Training	39	78	85	62	112	376
Other	71	19	0	6	89	185
Total	813	588	615	422	746	3,184

Through the ISSM and its associated Aviation Safety Division, many short courses emphasized aviation safety and process safety management. There were unique strengths of Drs. Najmedin Meshkati and Mansour Rahimi. Almost 50 courses were offered from 9/1/94 through 6/30/97.

During this project period, the CE Advisory Board has maintained strong relationships with both the public and private sector (Cal-OSHA, private and public entities, labor unions). The community resources have been valuable in assisting in the development, updating and ongoing decision-making regarding program direction.

Faculty resources have come from within and outside the ERC. From 1997-1999, more external community resources were used, both in teaching and in a consultative capacity. Program content continues to be enhanced by the faculty's active participation in professional associations such as ABIH, AIHA, ACGIH, ASSE, COHN, APHA, ACOEM, and others. These affiliations have helped faculty stay current with new and emerging issues.

Program Changes

Ms. Ruth Birkner was hired part-time in July, 1997, to restructure and rebuild the program. Because of her experience, knowledge, skills, contacts, and commitment to both EH&S and continuing education, Ms. Birkner has bridged the gap left with the closure of ISSM and helped maintain a continuing education presence in Southern California on target with the intent of the NIOSH grant.

There was a complete turnover in staff, administration, and most CE programs between years 15 and 16 in this reporting cycle. By Year 17, however, enrollment totals superseded those of grant reporting years 9, 10, 11, 14 and 15! More emphasis was placed on industrial hygiene, occupational medicine and hazardous substance training.

A portfolio of existing occupational health and safety courses was put in place through a strategic partnership between the ERC and McIntyre Birkner & Associates. Ms. Birkner pulled programs she had developed in her private practice into the ERC so that traditional programs could continue to be offered in Southern California after the closure of ISSM.

New courses offered included:

- EPA Risk Management Plans
- Guidelines for Voluntary OSHA Compliance
- Certified Hazardous Materials Manager Review and Exam
- Ergonomics: A California Update
- Train-the-Trainer Tutorials
- Comprehensive Industrial Hygiene Review
- 40-Hour, 24-Hour and 8-Hour Hazardous Waste Operations and Emergency Response Series

For the first time in the history of this ERC, a Centerwide logo was developed to promote the NIOSH initiative. This logo was used on: Centerwide promotion, the annual catalogue of course offerings, individual course announcements, exhibits at local AIHA and ASSE professional meetings, and on the national NIOSH ERC CE exhibit.

Ms. Birkner serves on the ERC Executive Committee, and in an ad hoc advisory capacity for the following groups: the USC/UCLA Occupational Medicine Residency Advisory Committee; UCLA's Occupational and Environmental Health Nursing Advisory Board; and the UCLA Center for Occupational and Environmental Health.

Due to funding limitations, the CE Director position continued as a part-time position from July, 1997 through June 30, 1999.

Honors and Awards

Currently, Ms. Birkner is President of the Southern California Section of the American Industrial Hygiene Association. In 1997, Ms. Birkner received a leadership award from the Pacific Coast Gas Association.

Conclusions

Continuing education is the visible link between the academic applied research community and the practicing community. Through Continuing Education, the Southern California ERC reaches out to regional physicians, nurses, industrial hygienists, safety engineers and other occupational safety and health professionals, paraprofessionals and technicians, including personnel from labor-management health and safety committees.

The CE Program has experienced many changes from July 1, 1994 through June 30, 1999. These include changes in leadership, physical location, administration and programmatic direction. Even with these changes, CE has maintained an excellent reputation for providing quality continuing education to the professional community.

Over this five-year reporting period, CE offered 151 programs with an enrollment total of 3,184—an average of 21 students per course. Programs were of high quality and of practical application to the attendees.

The vision is to establish a renewed and strengthened presence for the Southern California ERC Continuing Education program, which reflects the strengths of this ERC. This will take strategic partnerships, resources, and a commitment to the charge of improving worker health and safety.

With the support of ERC faculty, Advisory Committees and the surrounding community, this program serves a vital need in Southern California and Region IX. The plan is to offer 15-20 programs per year over the next five years based on the expressed needs and interests of our defined populations.

4) Outreach **John Peters, M.D.**

Final Progress Report
July 1, 1994 through June 30, 1999

Over this reporting period, outreach efforts in the core areas have consistently demonstrated numerous activities in the designated areas of educational development, presentations/lectures/seminars, consultations, and other efforts not specifically covered in the guidelines.

Faculty and staff of this inter-University consortium of USC, UCI and UCLA reported numerous activities including: authoring scientific publications, members of scientific advisory committees, being reviewers for scientific journals, serving as external site reviewers on NIOSH, NIEHS, special emphasis panels, and related grants. Outreach activities extend beyond the Southern California community to regional, national and international projects.

Community Outreach—Occupational Medicine

Under the direction of Dr. Peters and his faculty (Ed Avol, Dr. Rob McConnell, Dr. Frank Gilliland, Andrea Hricko), much community outreach has taken place through the Southern California Environmental Health Sciences Center (SCEHSC). These outreach programs connect an interdisciplinary team of occupational and environmental health scientists with at-risk populations. The Center develops community-based programs to address environmental health concerns and attempts to respond to community health concerns. The target communities are low-income, medically under-served, primarily minority populations.

Dr. Peters has participated in radio and television interviews furthering the cause of occupational and environmental health. Dr. Peter Wald, chair of the occupational medicine residency advisory committee, serves on the Board of Directors of the Western Occupational and Environmental Medicine Association.

The Center has worked on asthma education/environmental health programs with two community-based organizations: Communities for a Better Environment—focuses on environmental health concerns in southeast Los Angeles, the most heavily industrialized section of the city—and Mothers of East Los Angeles—a community group which focuses its efforts on the east side of Los Angeles.

Another example of this effort is the project funded through NIEHS and the Environmental Justice Partnership entitled Project HOPE—Health Opportunities, Problem Solving, and Empowerment. Dr. Wendy Robbins works on this outreach effort to serve diverse, at risk populations in Los Angeles, specifically Asian Americans in Long Beach and Richmond.

UCI—Occupational Medicine

Dr. Dean Baker has served as Chairman of the Occupational and Clinical Toxicology committee of ACOEM and as a member of the Public Affairs committee. He has also provided technical expertise on a national initiative sponsored by USEPA, DOL, USDA and DHHS to develop a strategy to train the nation's health care providers about the management of pesticide risks. He has also conducted media interviews and stores of medical problems associated with hazardous waste and childhood lead exposure.

Others actively involved in UC outreach efforts include: Ralph Allan, Dr. Joseph Fedoruk and Dr. Robert Phalen.

Industrial Hygiene

Industrial hygiene outreach has been extensive and on many levels with broad-ranging impact (local, regional, national and international). Dr. Bill Hinds has presented tutorials on particle properties and measurement within the U.S. and in Edinburgh, Scotland. All IH faculty have participated in an environmental and occupational health Fogarty Conference in Mexico City. Dr. Victor Liu has guided faculty from the Institute National de Salud Publica at Cuernavaca, Mexico in the development of an ergonomics program. He has also hosted a group of safety and health professionals from Taiwan's National Institute for Occupational Safety and Health, Taiwan Electric Power Company, and the Industrial Safety and Health Organization of the Republic of China.

Dr. John Froines has given presentations on his research of the health effects of diesel exhaust to California AIHA local sections. Both Drs. Hinds and Froines have received technical awards from the Southern California AIHA. Dr. Hinds has assisted the UCLA School of Engineering in the development of pollution prevention courses.

The Industrial Hygiene faculty have provided valuable occupational safety and health information to a number of labor unions and have given technical support to the Labor Occupational Safety and Health program at UCLA.

Occupational Health Nursing

Dr. Wendy Robbins and Dawn Stone have contributed to educational development by serving on the AAOHN Education Committee, serving on Peer Review Committees of AAOHN for endorsement of OHN programs, and the ANZI Z490 Committee on Criteria for Best Practices in Safety, Health, and Environmental Training. They have given testimony before the Legislative Hearings on the proposed TB standard and been journal reviewers for the column "Linking Practice to Research." Dawn Stone was an elected Board member of the Southern California Association of Occupational Health Nurses.

In terms of Centerwide outreach, both have made significant teaching contributions to the OHN CE short courses offered through UC Irvine.

CE Outreach

The CE outreach activities were diverse and demonstrated a broad range of issues confronting OH&S professionals. Ms. Cayuela and Ms. Birkner participated in NIOSH ERC CE directors' meetings throughout the reporting period. Both attended the HST-CE Directors meetings in conjunction with the Annual CE Directors' meetings. They were active in supporting the national NIOSH ERC exhibit and contributed to outreach by volunteering their time to exhibit at national conventions. Each also served as a NIOSH site visitor.

From 1996 to date, Ms. Birkner has served on the Executive Board of the Southern California AIHA as membership director, professional development director, president-elect and president of the association. She has also developed and presented numerous presentations for National AIHA and is a contributing editor for "Occupational Hazards" magazine. She and her husband have published two recent journal articles "2020 Vision: The Future of the Occupational and Environmental Hygiene Profession," AIHAJ, May, 1997, and "Anticipating and Evaluating Trends Influencing Occupational Hygiene," book chapter, "The Occupational Environment—It's Evaluation and Control," AIHA, October, 1997.

Hazardous Substance Training

For the several years, the CE program shared a joint Hazardous Substance Training grant with the Northern California ERC. The main focus of the curriculum was the development of pesticide-related courses. Courses were offered in California, Nevada, Hawaii and Arizona. With the change in leadership, this ERC successfully obtained independent funding for hazardous substance training in Southern California and other areas of Region IX effective July 1, 1999.

Occupational Safety

In the first three years of this reporting period, USC's Safety and Human Factors faculty, Drs. M. Rahimi and N. Meshkati, successfully incorporated occupational health and safety concerns into components of the Aviation Safety Program. The original curriculum centered on engineering issues. It was revised to include modules in ergonomics, human factors, bloodborne pathogens, substance abuse and workplace violence. Dr. Meshkati was extensively involved in research concerning nuclear power plants and the reduction of human error. He made several presentations to OCAW on invitation.

Conclusion

Innovative activities such as complimentary enrollment for students, or offering programs with minimal enrollment for community nurses, helps to demonstrate this Center's outreach commitment to the broader community. Faculty participation in advisory boards, in awareness seminars, as consultants and speakers illustrate a continuous effort

to disseminate health and safety information to diverse groups. Too numerous to mention are the day-to-day phone and e-mail contacts with the community requesting resources and/or information on health and safety issues. All of these types of activities and services make up an effective outreach program.

Southern California Education and Research Center December

1999

DEPARTMENT OF HEALTH & HUMAN SERVICES

Memorandum

Date May 18, 2000

From Principal Engineer, OECSP

Subject Final Progress Report for entry into NIOSHTIC/NTIS for NIOSH Training Grant No. T42 CCT 910430

To William Bennett, IRB, EID (C-28)

The enclosed report has been received from the Center Director to document work performed during the specified grant project period. The following information applies to the designated Education and Research Center (ERC):

Title: Southern California Education and Research Center

Center Director: John M. Peters, MD
Division of Occupational & Environmental Health
University of Southern California
1540 Alcazar St.
Los Angeles, CA 90089

Grant No.: T42 CCT 910430

Project Period: 7/1/94 - 6/30/99

Please place the report in DIDS and I also recommend it for entry into NIOSHTIC and submission to NTIS.

Thanks for your assistance.

John T. Talty, P.E., DEE

cc: S. Board/B. Kuchinski

Enclosure

fpr.cas.erc