INTRODUCTION

The University of California, Irvine Occupational Medicine Residency Program is a core teaching program of the UCI Center for Occupational and Environmental Health (COEH). The residency is based in the Division of Occupational and Environmental Medicine, Department of Medicine, College of Medicine. The residency program was established in 1976 and has trained over 55 physicians. Graduates of the program constitute 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 location of the residency program is a particular strength of the program. The University of California, Irvine, is a large and respected institution in Orange County. Orange County is a major population center with more than 2 1/2 million people, located to the south of and next to Los Angeles County. This location places the program in the center of Southern California with access to training opportunities ranging from Los Angeles through San Diego. The residency program functions on a regional basis.

The University of California, Irvine has a strong commitment to the residency program. The University provides support for program faculty and staff, and for office, clinical, teaching, and research facilities at the Center for Occupational and Environmental Health. The residency is also a component of the NIOSH-funded Southern California Educational Resource Center (ERC), which provides support for residents' stipends.

GOALS AND OBJECTIVES

The goal of the occupational medicine residency is to prepare residents for the comprehensive practice of occupational medicine in a variety of settings including private clinical practices, managed health care organizations, corporate medical departments, public health programs, and legal or regulatory authorities. The residency addresses the competencies specified by the Accreditation Council for Graduate Medical Education for residency training in preventive medicine – occupational medicine, as well as core competencies identified by the American College of Occupational and Environmental Medicine. A list of competencies addressed by the program is available for review. Graduates of the program are well prepared to take the ABPM certification examination in preventive medicine – occupational medicine.

Specific educational objectives include:

- To enable residents to acquire knowledge of and the ability to apply the core sciences of preventive medicine - that is, epidemiology, biostatistics, health care organization and administration, occupational and environmental health, and behavioral sciences - in the identification and solution of health problems in occupational groups.
• To help residents acquire knowledge and skills in toxicology, environmental monitoring, and safety evaluation as they apply to individuals and groups.

• To enhance residents' clinical knowledge in care of persons with occupational or environmental exposures and in assessment of suitability for employment.

• To teach residents about planning, management, and evaluation of occupational health programs in clinical practice and corporate settings.

• To develop in residents an understanding of the policy-making process in occupational medicine with respect to law, regulation, and workers' compensation.

• To create in residents an understanding of the roles and expertise of other occupational health professionals, and to collaborate with these professionals.

• To provide an opportunity for residents to develop independent research skills and to be able to use appropriate analytical techniques in the prevention of occupational diseases and injuries and in the evaluation of occupational health care programs.

These aims are achieved through the graduate degree programs during the academic phase, the field site training during the practicum phase, the clinical training in the UCI COEH clinic, the COEH clinical case conference and didactic seminars, and the resident projects.

PROGRAM STRUCTURE

The residency is designed as a two-year training experience consisting of an academic phase and practicum phase with ongoing core residency training activities. The program does not provide an initial clinical training year. Consequently, the program requires that entering residents have completed at least one year in an ACGME accredited clinical residency program and be licensed to practice medicine in the State of California. The program will consider for entrance into the residency, physicians who have completed the required clinical training and who have obtained a Master of Public Health degree or an equivalent degree from an accredited institution. These residents may be admitted directly into the practicum phase. The academic and practicum phases are functionally integrated because residents participate in occupational medicine clinical and core residency training activities, while taking courses during the academic phase. The program provides a range of academic and practicum training opportunities so residents can tailor their training to address their individual educational objectives, while ensuring that each resident receives solid training in the core areas of preventive medicine and occupational medicine.

The residency begins in August with a seven-week orientation and intensive introduction to the field of occupational health. Residents in the academic phase take courses for their MS degree programs during the fall, winter, and spring terms, which last from late September to June. The residents then do a practicum phase field site rotation during the summer period from June until late-September. Most residents then take one to two additional courses during the fall term of the second year, while completing their research project in fulfillment of the master's thesis. The rest of the residency is devoted to practicum training experiences. Residents finish the program at the end of July so they can qualify to take the occupational medicine board certification examination that same year.
**Orientation Period**

During this period, residents receive orientation and develop their individualized educational plan based on their self-assessment, prior training and experience, and educational objectives. The residents begin to participate in the COEH occupational and environmental medicine (OEM) clinics and the core residency didactic seminars. They visit multiple worksites and occupational medicine programs in the region for an introduction to workplace assessment and to practice opportunities in occupational medicine. They also complete courses on industrial hygiene, occupational safety, and introduction to occupational and environmental health laws and regulations. This period allows time for entering residents to interact with continuing residents and the program faculty so they can become thoroughly familiar with the educational opportunities and resources.

**Core Residency Training**

Throughout the two year residency, the occupational medicine residents participate in core residency training activities based at the UCI Center for Occupational and Environmental Health. These training activities include participation in the two COEH occupational and environmental medicine clinics, a weekly clinical case conference, the residency didactic seminar, journal club, worksite visits, and monthly COEH grand rounds.

**Occupational and Environmental Medicine clinics.** In addition to clinical training received in the field site rotations during the practicum phase, residents receive clinical training through their participation in the COEH occupational and environmental medicine (OEM) clinics. The COEH operates two full-time clinics. One clinic is based at the Center, located next to the School of Medicine on the UCI campus. This clinic functions as a regional consulting and referral center for occupational and environmental medicine clinic. Appointments include pre-placement and surveillance examinations, fitness-for-duty evaluations, and “case evaluations,” which can involve assessment of complex work- or environment-related issues in persons referred by employers, other specialists, public health agencies, individuals or other sources. For case evaluations, residents interview and examine the patient; discuss the patient with faculty members assigned to the clinic session; direct the diagnostic work-up; arrive at a decision regarding the diagnosis; and communicate with the patient regarding diagnosis, work-relatedness of the condition, and prognosis.

The other OEM clinic is based at the UCI Medical Center in Orange, CA. This clinic is the employee health service for the UCI Medical Center and it provides comprehensive workers compensation and employer services for a range of work places in the area. Under supervision of the attending faculty, residents manage workplace injuries and illness, as well as return-to-work determinations and medical surveillance examinations.

Residents attend one clinic session per week in either of the COEH clinics throughout the residency program, although residents may do a longer rotation in the UCI Medical Center clinic during the practicum phase. Residents are supervised, but they are given progressive responsibility for patient care.

**Residency didactic seminar.** The residency program sponsors a weekly occupational medicine didactic seminar. Residents are required to participate in the seminar during the practicum phase. We make this possible by arranging for the "full-time" field site rotations to be four days per week so that residents spend one day a week at the COEH.
Topics for the seminar are taken from the ACGME requirements for residency training in occupational medicine with additional consideration to topics presented in major textbooks on occupational and environmental medicine and to recommendations on core competencies defined by the American College of Occupational and Environmental Medicine. The residency program identifies a systematic list of topics and then identifies program faculty, clinical faculty, and guest speakers to present the topics for the residents.

Clinical case conference. The COEH has a bi-weekly clinical case. This conference serves as the attending rounds for the COEM clinic in which residents discuss case issues, case management strategies, clinical toxicology, and occupational medicine principles. The role of the COEH clinical training and case conference is to provide a continuous clinical training experience for the residents over both the academic and practicum phases. We have found that the weekly contact with COEH faculty provide continuity for the residents.

Journal club. The other required seminar is a bi-weekly residency journal club. The purpose of the journal club is to teach the residents how to critically read the scientific literature and to provide a mechanism for reviewing current issues in occupational and environmental medicine. Under faculty supervision, each resident in turn is required to identify an important, recent article. The resident then reads the article and other relevant citations and prepares a critique. The critique is presented in journal club to the faculty and other residents. All program faculty regularly attend the journal club and participate in the teaching. Principles of study design, epidemiology, clinical toxicology, and data analysis are emphasized in the discussions.

Work site visits. The core training includes work site visits with program faculty. The following are examples of sites visited recently by the residents: Allergan Pharmaceuticals, Exxon-Mobil Refinery; Exide-GNB Industrial Power; Steelcase Manufacturing; Toyota Car Manufacturing; Kimberly Clark Paper Mill; Mansfield Plumbing; Hunting Beach School District; Orange County Health Department; San Diego Poison Control Center; and the UCI Environmental Health and Safety Facility. Residents also visit work sites during the Cal-OSHA rotation.

Grand Rounds. The COEH sponsors a monthly grand rounds designed as a Continuing Medical Education program for practicing physicians. The program invites regional and national speakers to present at the rounds. This seminar increases the visibility of the COEH and maintains good collaboration with the professional community which ultimately enhances the residents training opportunities. Residents are expected to attend the Grand Rounds whenever their academic and practicum training schedules permit.

In addition, residents may attend other seminars in the School of Medicine - for example, the Department of Medicine Grand Rounds and noon conferences, as well as seminars of the Epidemiology and the Environmental Toxicology programs. The UCI Medical Center sponsors a range of residencies and fellowships. These programs provide substantial opportunity for residents to participate in research and clinical seminars.

Academic Phase

The principal objective of the academic phase is to provide didactic and research training in the core areas of preventive medicine and occupational and environmental medicine, while providing in-depth training in an area of greatest relevance to the resident's educational objectives. During the academic phase, the residents enroll in the Master of Science (MS) degree program in Environmental Toxicology, based in the UCI School of Medicine. The
residents must complete the degree program as part of the academic phase of the residency program.

**Master of Science in Environmental Toxicology.** This degree program is offered by the Division of Occupational and Environmental Medicine. The program is an outstanding option for residents since it provides in-depth training in toxicology, while satisfying the course requirements for preventive medicine. The residents complete required courses in toxicology and do an individual research project leading to a Master’s thesis. Options for elective courses in the toxicology program are used by residents to complete the required course work for the preventive medicine residency program. The degree program requirements are specified in the University catalog, which is available on the UC Irvine website.

Required or commonly taken elective courses taken during this degree program include: Principles of Toxicology, Target Organ Toxicology (2 courses), Experimental Design & Interpretation of Toxicology Studies, Neurotoxicology, Inhalation Toxicology, Environmental Toxicology, Industrial Toxicology, Toxicology Seminar, Data Analysis (statistics), Epidemiology and Biostatistics, Management of Health Care Organizations or Public Health Cost-Effectiveness Analysis, Health Psychology, and Environmental Epidemiology.

**PRACTICUM PHASE**

The principal objective of the practicum phase is to provide residents the opportunity to assume progressive responsibility for the practice of occupational medicine in a range of settings, while achieving each resident’s individual educational objectives. The practicum phase training has been a recognized strength of the UCI residency program. The excellent facility and resources of the COEH provide an outstanding setting for clinical and didactic training, while our close collaboration with occupational medicine programs in the region makes available a range of outstanding practicum training experiences. The major components of the practicum phase include field site placements, COEH clinical training, COEH didactics, and the individual research experience. Conceptually, the program divides the field site rotations into three types of experiences: corporate or worksite-based occupational medicine programs; regulatory or public health agencies; and comprehensive occupational medicine clinical practices. Residents complete at least one rotation in each setting. Residents may also undertake clinical training at UCI in areas relevant to occupational medicine practice.

During the practicum phase, residents spend most of their time in field site rotations which reflect the broad range of “real world” practice opportunities. Within these rotations, the residents are exposed to all aspects of practice including clinical care and evaluation of workers; medical surveillance; organization and management of occupational medicine programs; work place exposure assessment and control methods; and collection and analysis of health data. Meanwhile, residents receive clinical, didactic, and research training through interaction with the program faculty at the COEH. The training at the COEH provides continuity between the residents’ other training experiences.

**Field site placement**

Conceptually we divide the field site rotations into three types of experiences - corporate or worksite-based occupational medicine programs; regulatory or public health agencies; and comprehensive occupational medicine clinical practices. Residents are expected to complete at least one rotation in each setting. Residents may also undertake some clinical training at UCI in
areas relevant to occupational medicine practice - such as dermatology, radiology, and physical medicine/rehabilitation.

First, the rotation with Exxon-Mobil Oil provides full-time training in major industrial corporations. Residents participate in the full range of occupational medicine activities that occur in these corporations. The rotations with the U.S. Postal Service and the County of Orange Employee Health Service also provide a comprehensive range of learning experiences in occupational medicine programs. These rotations provide training experiences in the industrial and service sectors to complement the other rotations.

The field site placement with Cal-OSHA is an interesting and valuable component of the practicum training since it affords an opportunity for residents to view many work places and to become involved in issues related to occupational health law and regulation. The emphasis of the rotation is on work place exposure evaluation and regulatory compliance. The rotation takes place two days per week over several months so that residents have meaningful participation in work place evaluation and possible resultant regulatory actions. Under supervision, residents assume increasing responsibility for performing work place evaluations, doing research, and writing reports to be approved by the Cal-OSHA staff.

The third group of training sites is the rotations with the Kaiser Occupational Medicine Program or Sharp Rees-Stealy Medical Group. In these rotations, residents obtain comprehensive clinical training including performing pre-placement examinations, fitness for duty examinations, and OSHA mandated surveillance exams; evaluating and treating occupational injuries and illnesses; and treating employees under workers’ compensation. These rotations provide residents an opportunity to understand the comprehensive practice of occupational medicine in a group medical practice setting. Residents may also do a full-time rotation at the UCIMC Occupational Health clinic.

The program also offers rotations with the UCSD Toxicology and Poison Control Center and the UCSD Center for Occupational and Environmental Medicine that provide clinical and field training experiences in San Diego. The Toxicology and Poison Control Center rotation is taken full-time for one month, including an evening on-call schedule. The UCSD COEM rotation can be taken two to four days per week. This rotation emphasizes management of the university’s employee health service. The amount of patient is determined by the resident’s educational objectives. The rotation can be structured to function as a corporate, work-site based rotation.

Residents who desire more specialized clinical training may do ambulatory rotations with UCI Medical Center clinical programs, such as dermatology, pulmonary, physical medicine & rehabilitation, and radiology.

Research practicum

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 degree programs require research leading to a thesis. The residency program endorses the academic rigor of this approach by requiring that residents satisfy the thesis degree requirements in order to complete the residency.

The program director and faculty provide guidance to the residents in selecting their research topics for the masters degree thesis. In many instances, residents perform their research under
the supervision of an COEH faculty member - many of whom have joint appointments with the participating academic institutions. The COEH and the School of Medicine provide a rich environment for residents to undertake a full range of research activities. During the practicum phase, residents may extend the research they began in the academic phase or they may undertake new projects. These projects often develop from the field site rotations. The research experience is designed to provide knowledge, skills, and an appreciation of research without materially detracting from the residents' core training in comprehensive occupational and environmental medicine practice.