Division of Occupational and Environmental Medicine (OEM)
Annual Newsletter: Winter-Spring 2016

University of California San Francisco

CME 2016: Toxic Substances in the Workplace and the Environment, and Updates in Occupational and Environmental Medicine

REGISTER NOW! http://www.ucsfcme.com/2016/MDM16N01/info.html

The Division of Occupational and Environmental Medicine is gearing up for its upcoming Continuing Medical Education (CME) course in March, 2016. This educational event will take place in San Francisco over two and a half days, beginning Thursday morning, March 10 and ending midday on Saturday, March 12. There will also be a special poster abstract session and reception on the evening of Wednesday March 9, before the course lectures begin the next day. As in recent courses, the venue will be the Holiday Inn Fisherman's Wharf which, in addition to excellent meeting facilities, has proven to be attractively situated for out-of-town attendees.

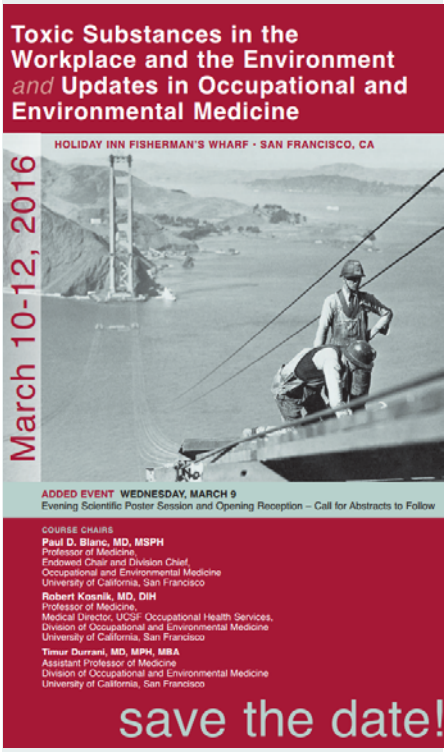
The 2016 Occupational and Environmental Medicine CME course will include a thematic focus for the pre-course evening poster session and a first day of lecture presentations: Toxic Substances in the Workplace and the Environment. The second day and last half day will provide multiple topics on Updates in Occupational and Environmental Health. The presentations in Toxic Substances in the Workplace and Environment include:

- Heavy Metal Toxicity: Going Beyond Lead, Mercury, and Arsenic
- Lessons Learned from the Poison Control Center
- Carcinogens - What Should You Know While Waiting for IARC
- Chemical in the Indoor Environment - New Threats on the Horizon
- Scenarios for De Novo Creation of Toxic Substances
- A Systematic Approach to Solvent Toxicity
- Liver Toxicants: Synthetic and Naturally Occurring, Classic and Emerging
- Chemical Toxicity to the Special Senses: Vision, Heating, Taste, and Smell
- New Fumigants, Herbicides, Insecticides, and Other Agricultural Chemicals

The Updates in Occupational and Environmental Medicine will include expert presentations on a wide range of topics:

- Common Laboratory Hazards
- Occupational Renal Disease
- Pediatric Environmental Illness - The Canary in the Coal Mine
- Reproductive Health and Occupational /Environmental Exposures
- Ebola as a Paradigm of Health Care Worker Risk
- Hypersensitivity Pneumonitis: Pigeons, Mold, and Odd Jobs
- Occupational Post-Traumatic Stress Disorder , including in Military Service
- Hazardous Jobs in Developing Economies
- Occupational Rhinitis
- Diabetes in the Workplace
- Diving: An Old Hazard that is Still Here
- Violence in the Workplace in the 21st Century

This course is designed to provide occupational and environmental health professionals and persons from other health-related disciplines with a review and update of current data in occupational and environmental medicine. It is intended to meet the needs of primary care providers and others engaged in occupational health practice and research including physicians (family physicians, general practitioners, internists, emergency medicine specialists), nurse practitioners and other nursing professionals, as well as physician's assistants, industrial hygienists, and health researchers and policy makers.



INSIDE THIS ISSUE

The Human Exposure Laboratory at SFGH

The lung is constantly exposed to various environmental pollutants, allergens, and toxins that interact with airways and alveoli. This can lead to injury, inflammation, and disease onset or exacerbation. Exposure-related lung diseases or disease exacerbations are increasingly recognized as a growing global health problem. This affects not only the respiratory system but also other organs including cardiovascular system. While epidemiological studies have provided a wealth of information on health effects of air pollutants, establishing causality has proven to be challenging and dependent on human experimental inhalational challenge and exposure studies.

Built in 1987 with funding from the University of California and private donors, the UCSF Human Exposure Laboratory at SFGH, under the aegis of the Division of Occupational and Environmental Medicine, is one of a handful of laboratories in the world that study the health effects of controlled exposure to air pollutants in humans. Over the years, the Human Exposure Lab has studied the health effects of a wide variety of air pollutants, including ozone, cigarette smoke, sulfuric acid fogs, nitrogen dioxide, chlorine gas, zinc oxide and magnesium oxide fumes, and ammonium sulfate particles. Typical experiments involve comparing the health effects of a short-term (30 minutes to 4 hours) exposure to real world levels of a pollutant to those of an exposure to clean filtered air. The heart of the Human Exposure Laboratory is its exposure chamber, a stainless steel-lined room with a tightly controlled air supply. The exposure chamber has an independent air supply, with filters that remove 99% of the particles and the volatile chemicals that are present in outdoor air. Temperature and humidity are carefully adjusted to enhance comfort and provide consistency from experiment to experiment. Surrounding the exposure chamber is the Human Exposure Lab clinical research facility which is equipped with systems to monitor and measure pulmonary and cardiovascular function and collect biospecimens to examine physiological, biochemical, and inflammatory sequelae of the inhalation of pollutants.

One of the earliest pollutants studied at the Human Exposure Lab was ozone. Inhalation of ambient levels of tropospheric ozone, a common air pollutant, causes oxidative stress and inflammation with both airway and systemic components. This relatively pure oxidative effect of inhalation of ozone makes it a suitable model for study of many respiratory diseases as evidence exists to suggest that many pollutants, even microbial organisms, share oxidative stress as a common underlying mechanism that contributes to disease and diseases exacerbation. Dr. Arjomandi of the Human Exposure Laboratory is studying the health effects of ozone in healthy and susceptible population. He is currently developing an experimental model of exacerbation in patients with COPD to examine the phenotype and function of innate and adaptive immunity at baseline and during exacerbation in a longitudinal manner. In 2015, Dr. Arjomandi was appointed Director of the Human Exposure Laboratory, taking over from its long-term previous director, Dr. John Balmes.

Each series of experiments on a new air pollutant begins with creating the equipment to generate the pollutant. In addition to ozone, secondhand tobacco smoke exposure has been an ongoing interest of the Human Exposure Laboratory. Back in 2007, Dr. Balmes and Dr. Suzaynn F. Schick built a system to generate secondhand cigarette smoke (SHS), in order to study the effects of SHS exposure on cardiovascular function and nasal congestion. Because smoke changes chemically and physically over time, the SHS system includes a special flow cell, where the smoke ages for 30-60 minutes and interact with cloth, paper and wallboard surfaces that are present in normal indoor spaces. This is the only facility in the world with machine-generated, aged cigarette smoke that provides a consistent, chemically accurate version of SHS exposure, for clinical research. The laboratory's studies have shown that just 30 minutes of secondhand smoke exposure can increase nasal congestion and impair the function of the endothelial cells that line arteries. Nasal congestion increases the risk of sinus infection. Impairment of endothelial cells increases the risk of heart attack and other types of cardiovascular disease.

The Human Exposure Lab at San Francisco General Hospital

The smoke generation system has also helped to show how cigarette pollution indoors can and create a chemical exposure that persists after the cigarettes are out. The nicotine and carcinogens in cigarette smoke stick to surfaces and deposit on cloth, paper and wallboard in the smoke aging cell. In this work, the Human Exposure Lab is a Core facility in the California Thirdhand Smoke Consortium, distributing smoke-exposed materials to researchers at UCSF, Lawrence Berkeley National Laboratories and UC Riverside who have shown that the contaminated materials can emit toxins for months after the smoke stops. This is called "thirdhand smoke" and it can cause DNA damage, disrupt energy metabolism in cells and inhibit wound healing.

The work is ongoing. In the future, researchers at the Human Exposure Lab will be studying the pulmonary and cardiovascular effects not only of traditional cigarette smoke (including thirdhand exposures) but also the effects of electronic cigarettes and wood smoke and examining how ozone exposure causes long-term changes in the lungs in health and disease.

Report from the COEH

The Northern California Center for Occupational and Environmental Health (COEH) is a multidisciplinary program of the University of California at Berkeley, Davis, and San Francisco. It is also one of the 18 regional Education and Research Centers (ERCs) funded by the National Institute for Occupational Safety and health (NIOSH). The Occupational and Environmental Medicine program at UCSF is one of the core components of COEH. Its mission is to promote health and safety in workplaces and communities by educating health professionals, developing new knowledge by undertaking interdisciplinary research, and responding to the needs of workers and the general public. There are over 60 COEH faculty members, as well as researchers and other professional staff from three UC campuses. The Director of the COEH is John Balmes, MD; the deputy director is Patty Quinlan, MPH, CIH.

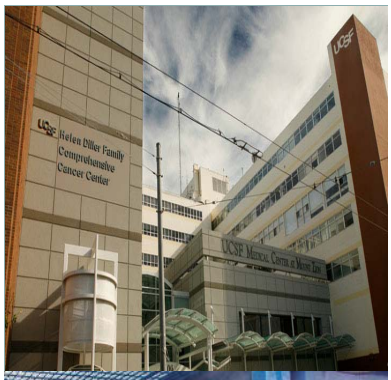
This past year, the Center's ERC successfully competed for an additional five years of funding from NIOSH. In addition to the five current academic programs in Occupational and Environmental Medicine, Occupational and Environmental Health Nursing, Industrial Hygiene, Occupational and Environmental Epidemiology, and Ergonomics, a new program in Agricultural Health and Safety was funded at UC Davis. Continued funding was also provided for the Continuing Education program and the Labor Occupational Health Program at UCB.

In addition to the ongoing programs above, COEH hosts: The annual *Lela Morris COEH Symposium*; the COEH *Continuing Professional Summer Institute*; semi- annual COEH get-togethers; the *Suzanne Llewellyn Student Project Award*; and the *Donald Whorton Writing Award*. For more information contact about these events and awards please contact Patty Quinlan, at pquinlan@berkeley.edu. COEH also publishes a quarterly newsletter, Bridges. To see the most recent issue and to subscribe: http://coeh.berkeley.edu/bridges/

Learn more about the program on our website:
http://coeh.berkeley.edu/ucsfoem/residency.html

COEH
CENTER FOR OCCUPATIONAL & ENVIRONMENTAL HEALTH

COEH Deputy Director Patty Quinlan, CIH; Residency Director Paul Blanc, MD; and OEM current Residents at Lehigh cement plant



Occupational and Environmental Medicine (OEM) Mount Zion Clinic Update

The UCSF OEM Clinic continues to be rooted in a faculty practice which has been operating for over 25 years. Our team of experts includes Board Certified physicians in occupational and environmental medicine, medical toxicology, occupational health nursing, and industrial hygiene. The clinic provides specialty consultation to individuals and groups of workers who have had exposures to biological, chemical, and physical agents at the workplace or home.

The OEM clinic provides leadership internally to the UCSF Medical Center in the execution of programs available to its health care workers for immunization review when starting work, for large scale program such as immunization for influenza, tuberculosis surveillance, and medical clearance to wear a respirator, and for groups of workers with special assignments, such as Ebola. The OEM medical team provides immediate access to care for health care workers when they have an exposure to blood borne pathogens, and for researchers when they have exposures from laboratory materials or research animals.

The OEM clinic's work for the UCSF medical center has been extended to biosafety issues in the UCSF research community. It provides immunization for infectious agents in research, monitoring of workers at risk, and responds to exposures when they occur. These services have already been extended to affiliated researchers and now is being extended to external groups. Workers at the California Academy of Sciences are getting medical clearance, spirometry, and fit testing for wearing respirators.

The OEM clinic evaluates workers following an exposure as a baseline assessment with recommendations for follow-up evaluation. Working with a group of workers with repeat assessments, provides consistency in medical surveillance. The OEM clinic provides the Department of Transportation examinations to individuals and groups of workers.

The OEM clinic develops specific medical surveillance and assessment programs customized for hazards in a group of workers. It designed a fitness for duty surveillance program for the San Francisco marine pilots who climb on board all large ships entering the Bay, and then navigate the ship into the Bay until it is safely alongside its berth. The program includes a medical surveillance assessment which includes an agility test, toxicology screening, and comprehensive medical examinations focused on the physical demands of their work as marine pilots.

The clinic is conveniently located within the UCSF Mount Zion campus just north of Geary and west of Divisadero at 2330 Post Street, Suite 460. The clinic can be reached by telephone at 415.885.7580. Referrals are accepted from physicians, other licensed medical practitioners, attorneys, and selected self-referrals from individuals.

For a link to the clinic go to: http://oem.ucsf.edu/care/clinics.html

Occupational and Environmental Medicine Residency: Personal Reflections by a Graduating Resident

As I transition in the next few months from a trainee to an Attending physician in Occupational and Environmental Medicine (OEM), I have many fond experiences to reflect on while at UCSF. I have learned a great deal about myself as well as about the world. I have seen how my own training background in Radiology has many differences, yet similarities to OEM. Though radiology (my previous specialty) was immensely interesting, it lacked the patient interaction, light bulb brightness of a room, and multiple career opportunities one hopes to have available upon graduation. However, throughout my UCSF training, I have been able to discover and connect my unique skillset with OEM.

Having been fortunate to enter the UCSF OEM program, I was immediately welcomed with open arms by all the faculty. Drs. Blanc, Harrison, and Kosnik have always been very approachable and keenly interested in catapulting my interests in a way that complemented my prior training. I've personally witnessed the ying and yang educational experience Drs. Blanc and Harrison provided. I always enjoy Dr. Blanc's sharp intellect and brilliant sense of humor, while Dr. Harrison always demonstrated the compassionate side of patient care, yet outside-the-box approach to diagnosis. These experiences routinely help remind me of specific clinical cases.

My first rotation was at our main clinical site at Mt. Zion. I remember interacting early on with a patient who was exposed to Prion disease while at work. To me, Prion disease was a USMLE Step 1 question one quickly memorized to pass the test. I would have never thought I would be treating a patient with this sort of exposure.

Continues on page 5

Personal Reflections from a Graduating Resident Continued from Page 4

However, within the first week and with the guidance of Dr. Kosnik, I was consulting world experts at UCSF, CDC, and the National Prion clinic in London, UK. Interestingly, the latter two consultations told me that the most knowledgeable person was at my home base, UCSF. The case progressed into a poster presentation and later a lecture at UCSF. We hope to eventually turn this into a published case report as well.

UCSF's OEM program has provided excellent clinical training with a plethora of musculoskeletal cases, interesting exposures, and toxicity cases. I've seen a continuous flow of cases involving back pain, shoulder, arm, and hand issues. Furthermore, exposure cases involving heavy metals (e.g., mercury, arsenic, and lead) are always part of my differential diagnosis. My interaction with residents from other programs tells me how fortunate we are to see such an expansive range of cases.

Our one-month, annual rotation in the summer brings all our residents together to enjoy the variety of site visits Patty Quinlan, CIH organizes in detail. Some highlights include visiting the animated group of people at Pixar, the cutting edge thinkers at Tesla, and the computer savvy techies at Intel. Standing beside Dr. Blanc and the team, this summer I also witnessed a scheduled explosion at a California quarry site. The numerous other sites visited certainly are unique to our program tapping the enormous opportunities in our great state, unlike any other.

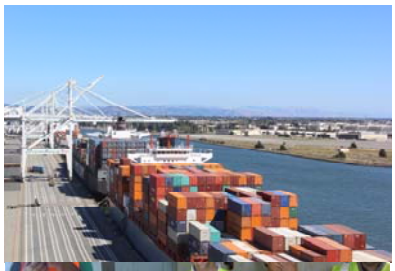
Getting a taste of corporate medicine was nothing like that experienced by working under Dr. Rich Cohen. A guru of Silicon Valley corporate medicine, he took me in under his wings and whisked me through the most educational experiences. Whether it was wearing bunny suits observing wafer chip manufacturing, or watching him in action giving expert court testimony, he treated me as his wingman. I truly treasure this experience and will encompass the skills acquired in my future practice.

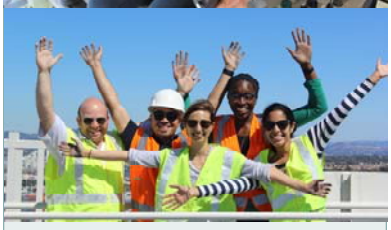
My year as a student in the MPH program at UC Berkeley was one of the greatest educational experiences of my time in the residency. At first, it was very daunting to become a student again after a long period, however, these fears quickly dissipated as I immersed myself into classes. I found myself amongst a sea of highly talented, intelligent, and immensely dedicated Professors and students. Walking around the campus viewing reserved parking signs for "Nobel Laureates only," instilled the feeling of elevating myself to a higher standard and achieving the nearly impossible. Drs. Balmes and Seward provided excellent mentoring, teaching, and supervision throughout the year. I loved learning about ergonomics from masters, Dr. Rempel and Ira Janowitz. Courses in health policy and management, statistics, and occupational epidemiology heightened my level of knowledge. I am very grateful for this superb experience and will be privileged to call myself a Cal Bear alumni!

Our program would not be as gratifying without having the privilege of working with my current co-residents, Drs. Khafagy, McLaughlin, Kaitz, Murphy, Agarwal, and Balogun. Each of my colleagues has unique training which makes our program a rich and diverse learning atmosphere. Their training includes Family medicine, Internal medicine, Preventive medicine, and Radiology. In addition, Dr. Murphy has a wealth of healthcare experience working for the past several years in the Air Force. I will miss our fun times and social get-togethers.

We are fortunate to add a new arsenal of incoming residents with an equally diverse training background. For the third year in a row, we are excited to have another Air Force physician, Dr. Meade join us. He is a former helicopter pilot with many years of valuable military occupational medicine experience. In addition, a second service (the Navy) will be represented by Dr. Montoya who also has extensive clinical experience. Another incoming resident, Dr. Landsman, is a UCSF medical school graduate who started his career by completing a one year surgery internship. He then went on to perform research at Harvard Business School. Finally, Dr. Holm is a pediatrician trained at Children's Hospital Oakland with a zest for research who will focus on environmental medicine. We are all thrilled to have them on board. The class of 9 residents in total is the largest we have ever had. As I progress towards graduation, I smile with great pleasure thinking of the countless experiences I will always cherish. I am very proud to have been accepted into this amazing program and look forward to becoming a proactive alumni enhancing future resident's experiences.

Raj Puri, MD, MPH
Chief Resident, UCSF, Division of Occupational and Environmental Medicine





Above: OEM residents at the Port of Oakland, August 2015

Below: Residents visiting Lawrence Berkeley Lab; Monterey Mushroom; and Pixar

ABOUT OEM

The Division of Occupational & Environmental Medicine, separately constituted at the UCSF Parnassus, Mount Zion, San Francisco General Hospital, and San Francisco Veterans Affairs Medical Center campuses, is closely interlinked. It has achieved national and international recognition as a center for research, training, and clinical care in its field.

The mission of the Division of Occupational & Environmental Medicine at UCSF is to advance the field of occupational and environmental health through research, education, and service to patients and the community.

UPCOMING EVENTS

Thursday—Saturday, March 10-12, 2016:

CME 2016: "Toxic Substances in the Workplace and the Environment, and Updates in Occupational and Environmental Medicine"
Poster abstract session to be held Wednesday evening, March 9.

Course Chairs: **Paul D. Blanc, MD, MSPH**; **Robert Kosnik, MD, DIH**; **Timur Durrani, MD, MPH, MBA**

To register: http://www.ucsfcme.com/2016/MDM16N01/info.html

Thursday, May 12, 2016:

Alice Hamilton Lecture: "From Baker's Asthma to Machinist's Lung—Occupational Lung Diseases an Internist Should Know About."

Presented by **Paul Cullinan, MD**, Professor of Occupational and Environmental Respiratory Disease, Faculty of Medicine, National Heart & Lung Institute, Imperial College, London.

For more information: https://oem.ucsf.edu/about/hamilton.html