Final Progress Report

NIOSH Training Grant T03 OH 008607

Occupational Safety and Health Training Grant

Project period 7/1/11-6/30/2016

Director Residency Training Program: Carrie Redlich, MD, MPH

Associate Director Residency Training Program: Jacqueline Cook, MD, MPH

Yale University School of Medicine

Occupational and Environmental Medicine Program

367 Cedar Street

Harkness Annex Building 2nd Floor

New Haven CT 06510

TABLE OF CONTENTS

ABSTRACT

The Yale Occupational and Environmental Medicine (OEM) residency training program based in the Department of Medicine and the School of Public Health at Yale University School of Medicine is one of the oldest and most highly regarded occupational medicine residency training programs in the United States. This residency training program was established in 1985 and has been supported as a Training Program Project by NIOSH since 1988.

The Yale OEM residency is an integrated two-year academic and practicum program leading to board eligibility for certification in Occupational Medicine by the American Board of Preventive Medicine as well as a Masters of Public Health (MPH) Degree. The program is fully accredited by the Accreditation Council for Graduate Medical Education (ACGME) and is currently approved for a total of four positions, two per year.

The goal of Yale Occupational and Environmental Medicine Residency training program is to train physicians to be proficient in all aspects of the practice of occupational and environmental medicine. It is the explicit goal of the Yale program to further train a proportion of these physicians to develop skills as educators and scientific investigators, in preparation for academic careers.

The Yale OEM residency program is one of only two residency training programs in New England and one of only six programs in the eastern United States. The Yale OEM residency program has been one of the most stable and productive residency programs in this region for over twenty-six years. The Yale OEM residency program specifically targets under-represented candidates and has been successful in recruiting and retaining these candidates.

Areas of program achievement include the continuation of an excellent track record for recruiting high-quality candidates into the field. Ten residents completed the residency training program during the most recent grant period. The majority of our graduates have gone on to full-time occupational medicine practice, while maintaining academic ties and continued teaching as fulltime or adjunct faculty. Therefore, this program addresses an important occupational health need to reduce the shortage of formally trained occupational medicine physicians at the regional and national level who serve as clinicians, educators and research scientists.

Other areas of achievement include: expansion of educational efforts within the medical school, including an Occupational and Environmental Medicine clinical rotation for medical students, residents and allied health professionals from Yale University and other programs within the State of Connecticut; an increase in research opportunities and research grants awarded to faculty; continued growth and development of clinical and consultative services; and augmentation of community outreach and educational activities.

Section 1: Highlights/Significant Results /Background

The Yale Occupational and Environmental Medicine Program under the Department of Internal Medicine at the Yale University School of Medicine provides comprehensive training for physicians in occupational and environmental medicine and has been training postgraduate physicians since 1985. Initially funded by a three-year developmental grant from the Charles A. Dana Foundation, the Program has focused on selection and training of physicians seeking specialized academic and/or research careers in Occupational and Environmental Medicine, while providing a broad base of practical and didactic experience for graduates choosing more traditional practice opportunities. The Program has been supported as a Training Program Project by NIOSH since 1988 and became an ACGME approved training program in 1989. The program is currently approved for a total of four positions.

The explicit goal of this program is to train physicians to be qualified specialists in the field of occupational and environmental medicine and to further train a proportion of these physicians to develop skills as clinician educators and scientific investigators, in preparation for academic careers.

The program has trained 57 physicians since its inception, including 11 physicians between 2010 and 2016. Our recent graduates have obtained excellent positions in a variety of occupational medicine settings including academic positions, governmental service and clinical practice in the private sector in different regions of the United States. Most of our past residents have also maintained academic ties and continue teaching as adjunct faculty. Consequently, this program addresses an important occupational health need to reduce the shortage of formally trained occupational medicine physicians at the regional and national level who serve as clinicians, educators and research scientists.

The Yale Occupational and Environmental Medicine program specifically targets under-represented candidates and has been successful in recruiting and retaining these candidates. Over the last 5 years, fifty percent of incoming residents were female and sixty seven percent were under-represented minorities. All of the past residents successfully completed the program.

The faculty of the Yale Occupational and Environmental Medicine program regularly performs outreach to local community hospitals and state, regional, and national professional associations for the purpose of disseminating knowledge specific to occupational and environmental health. We also offer elective clinical rotations for medical students, residents and allied health professionals from Yale University Medical Center and other affiliated hospitals within Connecticut and neighboring states. Each year, approximately 30 trainees from other programs spend up to one month of elective time at our program. We were successful in recruiting five residents from this pool into the Yale Occupational and Environmental Medicine Program from 2006-2011, an indication of the success of this outreach effort.

We have weekly research in progress conferences and monthly journal club sessions open to community physicians, residents from other programs and students from the School of Public Health.

Other areas of success include an increase in research opportunities and research grants awarded to faculty, continued growth and development of clinical and consultative services in conjunction with a permanent clinic facility dedicated to the provision of

occupational medicine services, and augmentation of community outreach and educational activities.

The training program has been greatly enhanced through the NIOSH grant support because the grant is used to fund the stipend for two of the four residents each year. In addition, the grant provides some funding for the director of the residency program and program coordinator and helps to cover travel expenses to attend the meeting of the Residency Directors in Occupational and Environmental Medicine at the American College of Occupational and Environmental Medicine (ACOEM) annual meeting and also support residents presenting their thesis as posters at this professional meeting.

Section 2: Technical Support

ORGANIZATIONAL INFORMATION

Program Administration

The Yale Occupational and Environmental Medicine (OEM) residency training program is based in the Department of Medicine and the School of Public Health at Yale University School of Medicine. Responsibility for the training of the residents rests solely and exclusively within the auspices of faculty and professional staff of the Yale Occupational and Environmental Medicine Program, under the leadership of Dr. Carrie Redlich, the section chief, and program director. Internal governance resides with the full time faculty who meet weekly. This faculty body assumes responsibility for all academic functions of the Program, including recruitment and selection. A Residency Advisory Committee, comprised of leaders from neighboring programs, physicians from industry and academic leaders from collaborating departments within the Medical Center meets twice annually to advise the program on all matters relating to training.

Program Faculty, 2011-2016

The full time faculty and professional staff are all dedicated to teaching, practice and research in occupational and environmental medicine and the training of the residents is the top priority of the program. The residents are integrated into all aspects of ongoing program activities and the ratio of full-time faculty effort to residents is never lower than 1:2. The faculty is a distinguished group of teachers with outstanding credentials. In addition to seven core full-time faculty, other faculty members and professional staff of the program share a large responsibility for training the residents in their areas of expertise (Appendix A).

Program Objectives

The Yale Occupational and Environmental Medicine Program (YOEMP) under the Department of Medicine at the Yale University School of Medicine and the Yale School of Public Health, provides comprehensive training for physicians in occupational and environmental medicine. The program has focused on selection and training of physicians seeking specialized academic and/or research careers in Occupational and Environmental medicine, while providing a broad base of practical and didactic experience for graduates choosing more traditional practice opportunities.

The Yale Occupational and Environmental Medicine residency program offers an integrated 2-year academic and practicum program with an optional third year for additional research experience. Completion of the program leads to board eligibility for certification in Occupational Medicine by the American Board of Preventive Medicine and a Masters in Public Health degree through the Yale School of Public Health.

During the first year, residents receive intensive training in the clinical aspects of Occupational and Environmental Medicine. Formal coursework begins this year, along with a wide range of enrichment activities provided by program faculty and staff who supervise all aspects of the training.

During the second year, residents complete their academic work and undertake a research project under direct faculty supervision. Residents continue their clinical training

in addition to block and elective rotations with corporate and government organizations. Throughout the training emphasis is placed on the scientific basis of Occupational and Environmental Medicine practice to prepare those so inclined for careers in teaching and research.

Practicum Phase

The practicum experience for Yale residents consists of training at the Yale Occupational and Environmental Medicine Clinic and practicum rotations at other participating sites. Residents begin training in the clinical aspects of Occupational and Environmental Medicine during the summer of their first year in the program and complete the practicum training during the second year. Residents spend one and a half days in the diagnostic clinic each week. Typically, by the end of the second year of training, each resident has seen most of the common occupational and environmental disorders and participated in several field investigations to follow-up on suspected cases or outbreaks of occupational or environmental disease.

The Yale Occupational and Environmental Medicine program has developed practicum rotations with various industrial sectors including the service industries, heavy and light manufacturing, and research and development facilities. These experiences provide the trainees with a wide opportunity to engage in supervised practice and gain experience through rotations in the “real world of work”. Each resident’s industrial experience is carefully planned by taking into consideration the individual’s long-term career objectives. These rotations are completed as a combination of longitudinal and block rotations. In addition to these rotations, residents participate in elective rotations at governmental organizations (e.g., Connecticut State Health Department, NIOSH and Occupational Safety and Health Administration) or other private industries.

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 also providing in-depth training in an area of greatest relevance to the resident's educational objectives. The training program accomplishes this objective by requiring all residents to complete the Masters of Public Health (MPH) program at the Yale School of Public Health. This program provides a general grounding in the core areas of public health (epidemiology, biostatistics, environmental health sciences, health services administration, and social and behavioral sciences). In addition to the core courses, residents are required to complete the required courses for the Occupational and Environmental Medicine Track and complete a master's thesis.

Research Activity

All residents are required to undertake an independent research project in the second year. This research also serves as the Masters of Public Health thesis. Residents choose a research topic and a faculty advisor at the beginning of the second year of training. Once the proposal is approved, the faculty advisor supervises the project and the resident provides periodic updates at the Research in Progress conference. A manuscript is submitted at the end of the second academic year**.** Residents are encouraged to present their research projects at scientific meetings and to publish their findings. Appendix B is a list of residents’ publications between 2011-2016.

Program Enhancements

Beyond the required elements, Yale residents participate in a broad range of academic activities within the section:

1. Journal Club: A monthly evening meeting at which a resident presents an article previously distributed, then discussed by an invited "expert" in the field of occupational medicine.

2. Research Conference: Weekly noon meetings, where scientists from the community and outside institutions present current research for critical discussion.

3. Research in Progress meetings: Monthly meetings in which faculty and residents present ongoing research projects for review and advice.

4. Participation in State, Regional and National Conferences: Each resident receives up to $1500.per year and up to one week off to attend an academic conference. The residents are encouraged to attend and present abstracts at these conferences.

5. The Yale Medical Center offers an impressive array of formal lectures and events on a daily basis, all of which residents may attend.

Training Facilities and Resources

The core training facility for this program is the office and clinic of Yale Occupational and Environmental Medicine Program (YOEMP). We recently moved our academic offices to an office suite located in the heart of the medical school at 367 Cedar Street, Harkness Memorial Builiding, second floor suite containing offices of all faculty, non clinical professional staff and residents. Strategically located across the street from Yale New Haven Hospital and two blocks from School of Public Health, where the majority of YOEMP courses are held, along with the conference room at the Harkness location. This location allows the trainees to have full access to all of the resources that Yale School of Medicine has to offer.

The clinic facility is located at 135 College Street which houses the clinic area, with examination rooms, testing facilities for audiometry, electrocardiography, visual acuity, spirometry and neuromuscular testing, a lab for blood and urine collection and processing. Aside from clinical equipment, computers and books, the major equipment owned by the Program for teaching is basic industrial hygiene instrumentation maintained by the industrial hygienist. Basic pumps and direct reading tubes and instruments are maintained at the office, along with a sample of personal protective equipment for use during field activities and teaching purposes. More extensive sampling equipment is available from Yale University's Environmental Health and Safety Services, the hygiene and safety group that services Yale, which is located in the same building as YOEMP clinic. In addition, YOEMP maintains off-site resources associated with research projects and service activities. Dedicated offices are also maintained at Yale New Haven Hospital and the West Haven V.A. Medical Center.

Each resident has an allocated office space with a computer and internet access. Faculty members have assigned laboratory space depending on ongoing research projects. Although there is no assigned laboratory space for the residents, available resources to which they have access include the Adult Clinical Research Center, inhalation exposure

chambers and laboratories at the John B. Pierce Laboratory, and the specialized laboratories of principal investigators in many departments at Yale University.

Training Candidates

Physicians are sought who have completed training in a clinical specialty. Prior public health or equivalent training is desirable. Similarly, the program encourages applicants who have been in practice. Because of the research emphasis of the program, candidates with research experience and/or stated goals for an academic career in Occupational and Environmental Medicine are given preference. Two new residents are admitted annually, and fully supported through either the training grant or other departmental funds.

The Program receives approximately 25-30 applications each year, though typically only about 1/3 of these meet all of the program requirements, including completion of prior residency training. The top 5-6 candidates who meet the requirements of the training program are invited to interview after which the top 2 candidates are offered first year positions. The program has been successful in recruiting the top choices over the last several years.

Minority Recruitment and Retention Plan

Minority and female physicians are strongly encouraged to apply to the program, reflecting the strong commitment of Yale University School of Medicine to train underrepresented minority physicians and scientists. We especially target under-represented residents at Yale New Haven Medical Center and other affiliated programs within the state. We have also encouraged current and past residents to serve as ambassadors to their former programs and participate in the interview process. This effort has helped tremendously to attract well-qualified minority and female candidates to apply to the program, thereby creating a steady pool of such candidates. Because of the relatively small size of the training program and large faculty, each resident, irrespective of his/her background, is carefully mentored by the faculty to meet his/her academic and professional needs once accepted into the program. Consequently, the Yale Occupational and Environmental Medicine program has been extremely successful in recruiting and retaining underrepresented candidates. Between July 2006 and June 2011, 50% of past and present residents are female while 67% are underrepresented minority trainees.

Graduates of the Training Program (July 2011 – June 2016)

Past Resident Trainees

We typically recruit 2 new residents each year, with 2 residents graduating from the program each year. Nine residents completed the training program from 2011 through 2016. Most of our past residents have maintained academic ties and continue teaching as adjunct faculty. Consequently, this program addresses an important occupational health need to reduce the shortage of formally trained occupational medicine physicians at the regional and national level who serve as clinicians, educators and research scientists. The Yale Occupational and Environmental Medicine program specifically targets under-represented candidates and has been successful in recruiting and retaining these candidates. Over the last 5 years, sixty percent of incoming residents were female and seventy percent were under-represented minorities**.** All of the past residents successfully completed the program. The following is a summary of the

projects, publications and current activities of our OEM Trainees during this project period, 2011-2016.

Leigh Wilson, DO MPH (2010 - 2012) [Preceptor- Carrie Redlich, MD, MPH}

Dr. Wilson started her training at the Yale Occupational and Environmental Medicine Program in July of 2010 after completing her residency training in a combined Internal Medicine & Preventive Residency Program at Griffin Hospital in Derby, Connecticut. She was on the NIOSH training grant during his first year of OEM residency training. Her research project "Assessment and control of risk factors in Spray Foam Workers". Factors identified in this study included physical size, job strain, exposure and time on job. Dr. Wilson is currently Medical Director of the North Shore-LIJ World Trade Center Health Program Clinical Center of Excellence.

Benjamin Blagogee MD MPH (2010 - 2012) [Preceptor Oyebode Taiwo, MD, MPH]

Dr. Blagogee joined the Yale Occupational and Environmental Medicine Program in July of 2010 after completing his Family Medicine residency training at Mercy Health System in Janesville, Wisconsin. He was supported by the NIOSH training grant during his first year of training. His research project was titled "Injury and return to work issues among truck and bus drivers" and was funded by ACOEM & Federal Motor Carriers Safety Administration. He presented his data at three conferences and submitted his manuscript for publication. Dr. Blagogee is currently a practicing occupational medicine physician at Wisconsin Health Center.

Ann Teng, DO, MPH (2011-2013) [Preceptor Carrie Redlich, MD, MPH]

Dr. Teng joined the Yale Occupational and Environmental Medicine Program in July of 2011 after completing her residency in Family Medicine at Wilson Memorial Regional Medicine Center, Johnson City, NY. Dr. Teng was supported by the NIOSH training grant during her first year of training. One research project was "Isocyanate Skin and Air Exposure to factory workers" another project Dr. Teng completed was a manual on "Mega-Shelter Operations with a Co-located Medical Needs Shelter". Dr. Teng also completed a project on Obstructive Sleep Apnea (OSA) that resulted in publication. She completed her training in June of 2013 and is currently an Assistant Professor at Upstate Medical University and Director of Occupational Services at UHS Wilson Medical Center, Johnson City, New York.

Teng AY, Won, C. Implications of OSA on Work and Work Disability Including Drivers. Clin Chest Med: 2012;33;731-44.

Rafael Lefkowitz, MD, MPH (2011-2013) [Preceptor Mark Russi, MD, MPH]

Dr. Lefkowitz entered the Yale Occupational and Environmental Medicine Program in July 2011 after completing his residency in Internal Medicine at Cedars-Sinai Medical

Center, Los Angeles, CA. Dr. Lefkowitz was supported by the NISOH training grant during his first year of training. His research project titled “Incidence of injury and illness in merchant seafarers” resulted in multiple publications and most recently Dr. Lefkowitz was awarded a K01 award to continue his studies. Currently he is Assistant Professor at Yale University and Staff Physician, Occupational Services West Haven VA Health System.

Lefkowitz, RY. "International Seafarers and Transnationalism in the Twenty-First Century." (Book Review)Journal of Occupational and Environmental Medicine 2015: 57(1), e1-e2. DOI:10.1097/JOM. 366

Lefkowitz RY, Slade MD, Stadler G, Andria V, DeSimone C, Redlich CA. Incidence of injury and illness inmerchant seafarers. Abstract/poster presented at American Occupational Health Conference; May, 2013.

Chang Rim Na, MD, MPH (2012-2014) [Preceptor Meredith Stowe, PhD]

Dr. Na entered the Yale Occupational Medicine Program in July 2012 after completing her internal medicine residency (primary care program) at Yale-New Haven Hospital/Yale University School of Medicine. Dr. Na was supported by the NIOSH training grant her first year of training. Dr. Na completed a two month elective rotation at National Park Service, Office of Public Health in Albuquerque, New Mexico under the supervision of Dr. David Wong. This rotation lead to Dr. Na’s thesis, “Climate and other risk factors for snakebites in New Mexico”. Dr. Na is currently a staff physician in occupational medicine at Kaiser Permanente, CA.

Raj Ahsan, MD, MPH (2013-2015) [Preceptor- Mark Russi, MD, MPH]

Dr. Ahsan entered the Yale Occupational Medicine Program in July of 2013 after completing his internal medicine residency at North Shore LIJ Health System/Hofstra University School of Medicine. Dr. Ahsan was supported by the NIOSH training grant his first year of training. Dr. Ahsan’s thesis was titled, “Evaluation of Yale New Haven Health Employee wellness program”, which analyzed biometric screening data from employees of Yale-New Haven Hospital. He worked closely with Dr. Mark Russi, Director of YNHH Employee Health and Martin Slade Research Director on this project. Dr. Ahsan is currently Director of Occupational Medicine at Norwalk Hospital, Norwalk, CT.

Jacqueline Cook, MD, MPH (2013 – 2015) [Preceptor- Carine Sakr, MD, MPH]

Dr. Cook entered the Yale Occupational Medicine Program in July of 2013 after completing her internal medicine residency (traditional program) at Yale-New Haven Hospital/Yale University School of Medicine. Dr. Cook was supported by the NIOSH training grant her first year of training. Dr. Cook’s thesis was titled “Evaluation of Safety Climate and Employee Injury Rates at Veterans Health Administration Facilities Nationwide”**.** Dr. Cook is currently the Chief of Occupational Health Services at VA Connecticut (West Haven and Newington.

"Evaluation of Safety Climate and Employee Injury Rates at Veterans Health Administration Facilities Nationwide." Presented as an oral presentation during the Resident Research Abstract Presentation session at the American Occupational Health Conference 2015, Baltimore, MD, May 4, 2015. Awarded American College of Occupational and Environmental Medicine Resident Research Presentation Award for presentation, 2015.

"Elevated Blood Lead Levels Related to Firearm Use". Presented as a poster presentation during the Resident Research Abstract Presentation session at the American Occupational Health Conference 2015, Baltimore, MD, May 3, 2015.

"Safety in Numbers: An Update on Injuries and Safety Culture in Healthcare". Yale Occupational Health Grant Work Group Meeting. Yale University School of Medicine, New Haven, CT. February 27, 2015.

Khaled Altassan, MD (2014 –2016) [Preceptor- Carine Sakr, MD, MPH]

Dr. Altassan entered Yale Occupational and Environmental Medicine Program in July of 2014 after completing a residency at Baylor College of Medicine, Houston, TX. Dr. Altassan is the recipient of a full scholarship from the Saudi Arabian Cultural Mission. His thesis title *is" Effect of union status on injury risk and severity in manufacturing".*

Gretchen Guzek, MD, MPH (2014–2016]) [Preceptor- Meredith Stowe, PhD]

Dr. Guzek joined the Yale Occupational and Environmental Medicine Program in July of 2014 after completing her primary care residency training at Yale New Haven Hospital, New Haven, Connecticut. She was supported by the NIOSH training grant during the first year of her training. Her thesis entitled "Injury prevalence and severity in graduate students in the Drama Department at Yale School of Drama**"**.

Current Residents

There are four residents currently in the program. Two residents are currently in their second year of training and are expected to complete the program in June of 2017.Two highly qualified candidates started their first year of training in July of 2016 and are expected to complete the program in June of 2018.

Linda Obekpa-Agwada, MD, MPH [2015 – EDC 2017]

Dr. Obekpa is currently a secind year resident who joined the Yale Occupational and Environmental Medicine Program in July of 2015 after completing a Family Medicine Residency at Heritage Valley Family Medicine in Beaver, Pa. Dr. Obekpa holds a master's of public health degree from University of Chicago which she obtained in 2012. She is was supported by the NIOSH training grant during her first year of training. She is expected to complete the residency program in June of 2017.

Mellisa Pensa, MD, MPH, [2015 – EDC 2017]

Dr. Pensa is currently a second year trainee who joined the Yale Occupational and Environmental Medicine Program in July of 2015. Dr. Pensa completed a combined residency in Family Medicine and Preventive Medicine at Oregon Health & Science University. She also holds a master's degree in public health from the OHSU School of Public Health. Dr. Pensa is board certified in Family Medicine and Preventive Medicine. She was supported by the NIOSH training grant her first year of training. She is expected to complete the residency program in June of 2017. Dr. Pensa presented a poster at the 2015 NECOEM conference in Boston:

Authors: Mellisa Pensa, MD, MPH, Deron Galusha, MS, Meredith Stowe, PhD, Rafael Lefkowitz, MD, MPH, Carrie Redlich, MD, MPH Title: *Patterns of Energy Drink Consumption and Associated Symptoms among a Population of Factory Workers*

Brian Linde, MD [2016- EDC 2018]

Dr. Linde is currently a first year trainee who joined the Yale Occupational and Environmental Medicine Program in July 2016. Dr. Linde completed a four year residency at Yale Internal Medicine Primary Care before joining YOEMP. He is currently supported by the NIOSH training grant. He is expected to complete the residency program in June of 2018.

Daniel Stopka, MD [2016 – EDC 2018]

Dr. Stopka is currently a first year trainee who joined the Yale Occupational and Environmental Medicine Program in July 2016. Dr. Stopka did his residency in Family Medicine at University of Illinois. He is expected to complete the residency program in June of 2018.

Outreach Program

The Yale program is the only specialty training program in Occupational and Environmental Medicine within the State of Connecticut and one of only two such programs in New England. As such, we view outreach to the broader medical community as a critical element of our work. The faculty regularly performs outreach to local community hospitals and state, regional, and national professional associations for the purpose of disseminating knowledge specific to occupational and environmental health.

We offer elective clinical rotations for residents from other training programs, medical students as well as students in the allied health professions within Yale University Medical Center, other hospitals within Connecticut and neighboring states. Often, this is the only exposure to this field for these residents and students. An average of 30 -35 trainees from other programs spend up to one month of elective time at our program every year. We were successful in recruiting six residents from this pool into the Yale Occupational and

Environmental Medicine Program from 2010-2016, a strong indication of the success of this outreach effort.

We have weekly research in progress conferences and monthly journal club sessions open to community physicians, residents from other programs and students from the School of Public Health. Our residents frequently present at the research in progress conference and the journal club sessions.

Conclusion

The Yale Occupational and Environmental Medicine Program at Yale University School of Medicine has been successful in meeting its stated goal of providing comprehensive training for physicians in occupational and environmental medicine. Currently, these trained physicians are serving in various capacities throughout the country and thus address an important occupational health need to reduce the shortage of formally trained occupational medicine physicians at the regional and national levels. The program was able to achieve this success largely because of the NIOSH training grant, which funded the stipend for many trainees and also provided additional funding for core faculty as well as staff members primarily responsible for administration of the training program.

LIST OF KEY FACULTY

NAME	APPOINTMENT	INSTITUTION	SPECIFIC AREAS OF EXPERTISE
CORE FACULTY			
Jacqueline Cook, MD, MPH	Clinical Instructor	Yale School of Medicine	Internal Medicine, Occupational and Environmental Medicine
Mridu Gulati, MD, MPH	Assistant Professor	Yale School of Medicine	Internal Medicine, Pulmonary Medicine, Occupational and Environmental Medicine
Raj Ahsan, MD, MPH	Clinical Instructor	Yale School of Medicine	Internal Medicine, Occupational and Environmental Medicine
Rafael Lefkowitz, MD, MPH	Assistant Professor	Yale School of Medicine	Internal Medicine, Occupational and Environmental Medicine
Carrie A. Redlich, MD, MPH	Professor	Yale School of Medicine	Internal Medicine, Pulmonary Medicine, Occupational and Environmental Medicine
Mark Russi, MD, MPH	Professor	Yale School of Medicine	Internal Medicine, Occupational and Environmental Medicine Occupational Epidemiology
Martin Slade, MPH	Lecturer	Yale School of Medicine	Biostatistics, Research Methods
Robert Klein, CIH	Lecturer	Yale School of Medicine	Industrial Hygiene & Safety Exposure Assessment
Meredith Stowe, PhD	Research Scientist	Yale School of Medicine	Environmental Epidemiology
SUPPORT FACULTY/STAFF			
Linda Cantley, PT, MS	Research Associate	Yale School of Medicine	Physical Therapy, Musculoskeletal Disorders, Ergonomics
Brenda Cartmel, PhD	Research Scientist	Yale School of Medicine	Epidemiology
Deron Galusha, MSc	Biostatistician	Yale School of Medicine	Biostatistics
Carole Holm, RN	Clinical Nurse Researcher	Yale School of Medicine	Nursing
Baylah Tessier-Sherman, MPH	Research Associate	Yale School of Medicine	Chronic Disease & Environmental Health, Data Management
Adam Wisnewski, PhD	Associate Professor	Yale School of Medicine	Immunology/Biomarkers

NAME	APPOINTMENT	INSTITUTION	SPECIFIC AREAS OF EXPERTISE
ADJUNCT FACULTY			
Jonathan Borak, MD	Clinical Professor	Yale School of Medicine	Internal Medicine, Occupational and Environmental Medicine Toxicology, Risk Assessment
Howard Cohen, PhD, CIH	Clinical Professor	Yale School of Medicine	Industrial Hygiene, Safety, Exposure Assessment, Respiratory Protection
Ann McB Curtis, MD	Professor	Yale School of Medicine	Diagnostic Radiology, Thoracic Radiology
Mayur Desai, MPH, PhD	Assistant Professor	Yale School of Public Health	Epidemiology, Chronic Diseases
Coralie Shaw, MD	Professor	Yale School of Medicine	Thoracic Radiology
Karl Watsky, MD	Professor	Yale School of Medicine	Occupational Dermatology

Appendix B: Residents' Publications & Presentations 2011-2016

Teng AY, Won, C. Implications of OSA on Work and Work Disability Including Drivers. Clin Chest Med: 2012;33;731-44.

Lefkowitz, RY. "International Seafarers and Transnationalism in the Twenty-First Century." (Book Review)Journal of Occupational and Environmental Medicine 2015: 57(1), e1-e2. DOI:10.1097/JOM. 366

Lefkowitz RY, Slade MD, Stadler G, Andria V, DeSimone C, Redlich CA. Incidence of injury and illness inmerchant seafarers. Abstract/poster presented at American Occupational Health Conference; May, 2013.

Cook, JM. "*Elevated Blood Lead Levels Related to Firearm Use"*. Presented as a poster presentation during the Resident Research Abstract Presentation session at the American Occupational Health Conference 2015, Baltimore, MD, May 3, 2015.

Lefkowitz R, Rabinowitz PR, Conti L. "Pets and Zoonotic Infection: Understanding the Risks" Accepted for publication in Family Physician, 2012.

Blagogee B, Cantley L, Fleeming R, Slade M, Taiwo OA. Predictors of Non-Motor Crash Related Occupational Injuries among Truck and Bus Drivers. Report Submitted to FMCSA, 2012.

Wilson L, Redlich C. A Case Series of Home Owners with Symptoms Related to Persistently Off-Gassing Polyurethane Spray Foam Insulation. January 2012. Abstract submitted to ACOEM for presentation at the April 2012 annual meeting.

Wilson L, Redlich C. Green Construction: A New Cause of Isocyanate Asthma. January 2012. Abstract submitted to ACOEM for presentation at the April 2012 annual meeting.

Blagogee B, Cantley L, Slade M, Taiwo OA. Factors associated with Injuries among truck and bus drivers. Poster Presentation at the American Public Health Association (APHA) Conference, Washington DC, 2011.

Blagogee B, Petterson S, Phillips R, Bazemore A. Usual Source of Care, Avoidable hospitalizations, and Selected Health Outcomes. Poster Presentation at the North America Primary Care Research Group Annual Meeting, Banff Alberta, Canada, 2011.

Cook, JM. "*Evaluation of Safety Climate and Employee Injury Rates at Veterans Health Administration Facilities Nationwid"e*. Presented as an oral presentation during the Resident Research Abstract Presentation session at the American Occupational Health Conference 2015, Baltimore, MD, May 4, 2015. Awarded American College of Occupational and Environmental Medicine Resident Research Presentation Award for presentation, 2015.

Cook, JM. *"Safety in Numbers: An Update on Injuries and Safety Culture in Healthcare"*. Yale Occupational Health Grant Work Group Meeting. Yale University School of Medicine, New Haven, CT. February 27, 2015.

Pensa, M, Galusha, D. Stowe, M Lefkowitz, R. Redlich, CA " *Patterns of Energy Drink Consumption and Associated Symptoms among a Population of Factory Workers"*

Appendix (3) C: Description of Required MPH Courses

Biostatistics

BIS 505a, Introduction to Statistical Thinking I. This course provides an introduction to the use of statistics in the fields of epidemiology and public health. Topics include descriptive statistics, probability distributions, parameter estimation, and hypothesis testing, as well as an introduction to sampling and simple linear regression. Statistical analysis using the Statistical Analysis Systems (SAS) software and development of communication skills relative to the presentation of these analyses are introduced. E. Claus.

Epidemiology

CDE 508a/EMD 508a, Principles of Epidemiology I. This course presents an introduction to epidemiologic definitions, concepts, and methods. Topics include history of epidemiology, descriptive epidemiology, measurement of disease occurrence and association, study design (ecologic, cross-sectional, case-control studies, cohort, and intervention), surveillance, measurement validity and screening, random variation and precision, bias, confounding, effect modification, and causality. The course also teaches skills for quantitative problem solving, and the understanding of epidemiologic concepts in the published literature. L. Niccolai.

CDE 534b, Applied Analytic Methods in Epidemiology. This computer lab-based course provides students with a comprehensive overview of data management and data analysis techniques. The SAS statistical software program is used. Students learn how to create and manipulate data sets and variables using SAS; identify appropriate statistical tests and modeling approaches to evaluate epidemiologic associations; and perform a broad array of univariate, bivariate, and multivariate analyses using SAS and interpret the results. Prerequisites: BIS 505a, CDE/EMD 508a, and students must have taken or currently be taking BIS 505b (or, for Advanced Professional M.P.H. students, successful completion of BIS 515c and CDE 515c). M. Desai.

Behavioral Health

CDE 505a/PSYC 657a, Social and Behavioral Foundations of Health. This course provides students with an introduction to social and behavioral science issues that influence patterns of health and health care delivery. The focus is on the integration of biomedical, social, psychological, and behavioral factors that must be taken into consideration when public health initiatives are developed and implemented. The course emphasizes the integration of research from the social and behavioral sciences with epidemiology and biomedical sciences. B. Levy.

Health Policy and Administration (One of the following two courses):

HPA 510a, Introduction to Health Policy and Health Systems. This course provides an introduction to the making and understanding of health policy. The various goals of policy

making and the alternative means of achieving those goals are examined. Health issues are placed in the context of broader social goals and values. The current performance of the health care system is assessed, with particular emphasis on shifting needs, rising costs, and changing institutional arrangements. The course provides an overview of the important actors in the health care and political systems and introduces students to methods for understanding their behavior. Students apply these methods to a set of concrete policy issues. J. Schwartz.

HPA 560b, Health Economics and U.S. Health Policy. This course introduces students to the organization and operation of the American health care system. The course examines systems of health care delivery and finance and recent trends in their organization, including the growth of managed care. The course seeks to provide students with an understanding of the existing structure of the system and with conceptual frameworks. Z. Cooper.

Environmental Health

EHS 503a/F&ES 896a, Principles of Toxicology. This course introduces students to the concepts and nomenclature of toxicology. Emphasis is placed on the absorption, distribution, metabolism, and elimination of toxic substances. Our goal is to provide a fundamental understanding of important toxicological principles and their relevance to the more general study of human health. The course utilizes case studies that require students to apply their knowledge of toxicologic concepts and processes to refine issues and solve problems in epidemiology and public health. J. Borak, C. Fields

Occupational & Environmental Medicine Track (the following courses):

EHS 505a, Occupational Exposure Assessment and Control. This course offers an introduction to methods used to protect the health and safety of workers. Topics include exposure assessment for identifying and evaluating chemical and physical hazards; ergonomics; health and safety standards; personal protective devices; management programs to control hazards; injury and illness record-keeping; and worker's compensation programs. Case studies complement traditional lectures. Offered every other year. H. Cohen.

EHS 511b/F&ES 893b, Applied Risk Assessment. This course introduces students to the nomenclature, concepts, and basic skills of quantitative risk assessment (QRA). The goal is to provide an understanding necessary to read and critically evaluate QRA. Emphasis is on the intellectual and conceptual basis of risk assessment, particularly its dependence on toxicology and epidemiology, rather than its mathematical constructs and statistical models. Specific cases consider the use of risk assessment for setting occupational exposure limits, establishing community exposure limits, and quantifying the hazards of environmental exposures to chemicals in air and drinking water. J. Borak, C. Fields.

EHS 573b, Epidemiological Issues in Occupational and Environmental Medicine. This course explores issues around the detection and characterization of health outcomes from environmental and occupational exposures. Case studies include infectious disease outbreaks, cancer clusters in the general environment and within industrial settings, groundwater contaminations and birth defects, lung diseases and cancers following the World Trade Center attacks, health sequelae in military populations, radon exposures and

lung cancers in miners and in the general population, exposures among marginalized populations. The course is taught in discussion format by occupational and environmental medicine faculty. There is a take-home final examination. M. Russi, M. Slade.

EHS 575a, Introduction to Occupational and Environmental Medicine This course presents a broad overview of the principles of occupational and environmental medicine. The major diseases of environmental origin and the major hazards—chemical, physical, and biologic—and settings in which they occur are examined. C. Redlich, M. Stowe.