

Final Progress Report

**NIOSH Training Grant T03-OH008607
Occupational Safety and Health Training Project Grant
Project period 07/01/2016 - 06/30/2021**

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List of Abbreviations

ACGME: Accreditation Council for Graduate Medical Education

ACOEM: American Occupational and Environmental Medicine

AOHC: American Occupational Health Conference

APD: Associate Program Director

APHA: American Public Health Association

CIH: Certified Industrial Hygienist

NECOEM: New England College of Environmental Medicine

OEM: Occupational and Environmental Medicine

OMR: Occupational Medicine Residency

OSHA: Occupational Safety and Health Administration

PD: Program Director

PM: Preventive Medicine

VACT: Connecticut Veterans Medical Center

YSPH: Yale School of Public Health

YNHH: Yale New Haven Hospital

Abstract

There is a critical shortage of physicians trained in occupational medicine (OM) across the U.S. at a time of rising workplace challenges and exposures. The COVID-19 pandemic has highlighted the urgent need for OM and public health / preventive medicine (PM) trained physicians. Over the past 5 years this NIOSH Training Program Grant (Occupational Safety and Health Training Project Grant, T03-OH008607) has provided critical support to the Yale Occupational and Environmental Medicine (OEM) residency training program, thus helping to train physicians with the skills and knowledge to recognize and prevent work-related illness and injury.

The Yale OEM residency training program, based in the Department of Medicine, Yale School of Medicine, is one of the oldest and most respected OEM residency training programs in the U.S. and one of only two OEM residency training programs in New England. The integrated two-year Preventive Medicine, Occupational Medicine residency training program is fully accredited by the Accreditation Council for Graduate Medical Education (ACGME) and leads to board eligibility for certification in PM and OM by the American Board of Preventive Medicine (ABPM) as well as a Master of Public Health (MPH) Degree from the Yale School of Public Health. The program is currently approved for a total of four positions, two per year. Trainees admitted to the program are expected to have completed an initial ACGME accredited residency, typically Internal Medicine or Family Medicine.

This NIOSH funding helps support 2 OEM physician trainees a year, thus 10 physician trainees over the past 5 years, with the overarching goal of providing physicians with the tools and expertise to improve the health and well-being of U.S. workers. Numerous other Yale residents and students also benefit from the OH focused educational activities during elective rotations. The Yale OEM training program is continually evolving to meet the new hazards and challenges U.S. workers and employers face, such as COVID-19.

There have been multiple areas of achievement over the past 5 years of funding. Foremost has been the successful recruitment, training and graduation of 10 highly qualified OEM resident physicians. Additional accomplishments have included: securing greater institutional support for the Yale OEM Training Program, stable senior leadership (Dr. Redlich), the recruitment of 3 new OEM physician faculty, a number of curriculum enhancements, continued ACGME accreditation without citations, and new enhanced office space. The past 10 Yale OEM residents have all become board certified in PM / OM and are all employed as OEM physicians in clinical, academic and/or leadership positions. Their current activities include occupational health practice and policy, educating U.S. clinicians and workers about occupational hazards and prevention, and occupational health research. This NIOSH Training Program Grant thus helps address the serious shortage of OEM trained physicians and advance the health of US workers.

Program Summary: OMR Training Program Accomplishments

Residency Program Development and Growth

- **Substantial new institutional (Yale-YNHH) financial support:** for the OEM physician residents (0.5 FTE), for the Program Director (PD) (0.2 FTE), for the Associate Program Director (APD) (0.1 FTE), and for the Program Coordinator (0.5 FTE)
- **OEM Program relocated (fall 2015) to centrally located prime academic space** in one of the main YSM academic buildings (ES Harkness) with offices for faculty, residents, staff, and a conference room
- **New Faculty Recruitment and Development efforts**, including:
 - i **Successful recruitment of three junior faculty at the instructor level** (Brian Linde MD, MPH, Efi James MD, MPH, Louis Fazen MD, PhD), including one position with a Clinical Informatics focus. Junior faculty have brought new energy and ideas and taken on expanded role on university and hospital committees, and also as co-course leaders in public health courses.
 - ii **Formalized faculty mentorship program** with regular mentor meetings, departmental oversight, special educational sessions, and retreat for clinician educator faculty
- **COVID-19:** Yale OEM trainees extensively involved in response to COVID-19, including:
 - i Guidance on COVID-19 policies and guidelines
 - ii Educational outreach and risk communication to health care and other at-risk workers
 - iii Implementation of several seroprevalence studies of at-risk workers (1,100 health care workers, 900 CT national guard members, 1,200 Mohegan team and tribal members) to better understand COVID-19 infection, risk factors, and immunity, and improve preventive efforts.
- Established a **new annual fund dedicated to OEM resident educational activities**. In its first year the fund raised over \$10,000 from former trainees, faculty, and friends.
- **New annual retreat for OEM faculty and residents.**
 - Year 1: Program mission, future.
 - Year 2: Risk communication to patients, workers, the public.
- **Stable Senior Program Leadership** (Dr. Redlich, PD) with recruitment of **new APD, Dr. Linde**, a gifted OEM clinician educator.

Program Curriculum and Evaluation

- **New elective rotations established**, including CT OSHA rotation and Lincoln Financial
- **Modified required MPH courses** in line with ACGME's redefined five core areas, allowing for greater curricular flexibility
- **New site visit program for residents**, organized by Rob Klein, CIH. 5-10 site visits / year to a range of industrial and non-industrial work sites, including construction projects, power plant, recycling / waste to-energy incinerator, sewage treatment plant, drinking water treatment facility, brewery, and quarry.
- **Enhanced didactic content in Emergency Preparedness** as an outgrowth curriculum needs assessment.
- **Yale OEM Guest Lecture series** enhanced by Zoom enabling a greater range and quality of speakers.

Program Evaluation and Accreditation

- Continued ACGME accreditation without citations. The Review Committee commended the program for its demonstrated substantial compliance with the ACGME's Program Requirements
- Completed ACGME 10-Year Self-Study Document. Members of the Self Study Group/ Annual Program Evaluation Committee received formal approval from the ACGME in December 2018 and was commended for being well thought out. Awaiting ACGME 10-Year Accreditation Site Visit.
- Implemented a survey of recent graduates in 2018 to aid in assessment of how the training program prepares trainees for careers in occupational medicine.

Specific Program Deliverables past 5 years

- Over 30 applicants per year eligible for NIOSH support.
- Recruitment of 2 new highly qualified residents yearly, supported by NIOSH with 100% retention and graduation of OEM residents, 2 per year over the past > 5 years.

- Continued strong representation of under-represented minorities (20%) and women (60%) over the past 5 years (10 residents)
- Increased diversity by other measures (disability, ethnic-religious, CT national guard).
- The most recent 12 graduates are all employed in OEM related careers. All took and passed PM OEM Board examination first attempt (10/10 100% pass, 2 most recent graduates to take exam Oct 2021).
- Program Leadership has been stable.

Individual Resident Progress Reports

All Yale Occupational and Environmental Medicine Program residents are supported by the NIOSH training grant during their first year of OEM residency training. Funds received over the last five years supported resident's stipend and health insurance premiums.

Linda Obekpa-Agwada, MBBS (MD), MPH (July 2015 – June 2017)

Dr. Obekpa joined the Yale OEM training program in July of 2015 after having completed a full Family Medicine Residency and also a master's of public health (MPH) degree from University of Illinois. Her research during training analyzed health care worker employee injury data, which were presented to the hospital leadership, and which spurred additional preventive measures.

Board certification: Family Medicine, Preventive Medicine – Occupational Medicine

Current position: Family Medicine and Urgent Care Provider, John Muir Medical Group, Brentwood CA

Mellisa Pensa, MD, MPH, (July 2015 – June 2017)

Dr. Mellisa Pensa had completed a combined residency in Family Medicine and Preventive Medicine, including a MPH degree, at Oregon Health & Science University and was on the faculty at University of Virginia prior to deciding to pursue specialized training in OEM at Yale. During her 2-year training Mellisa Pensa worked on several OEM practice and research projects primarily focused on the impact of health, work and environmental disparities. These included co-authoring the ACOEM guidance document on "Managing the Health Impacts of Climate Change", investigating the impact of energy drinks and opioid use in manufacturing workers, and developing educational materials to teach OEM to primary care physicians. After graduation Dr. Pensa joined our faculty as an instructor, but after a year she was unexpectedly offered a unique position at Fair Haven, a FHCHC closely linked to Yale, enabling her to integrate OEM education and practice with primary care. She oversees clinical research and the education of Yale Medicine residents at FHCHC and remains on the clinical faculty in the Yale Dept of Medicine.

Presentations: Multiple posters and presentations at ACOEM, NECOEM, and APHA.

Publications: see below

Board Certification: Family Medicine, Preventive Medicine – Occupational Medicine

Current Position: Clinical Lead, Health Equity, Family Medicine Physician, Employee Health Physician, FHCRC and Clinical Assistant Professor, Site Director, Ambulatory Curriculum, Yale School of Medicine.

Brian Linde, MD, MPH, (July 2016 – June 2018)

Dr. Brian Linde received his medical degree at the Albert Einstein College of Medicine and is a graduate of Yale's Primary Care Internal Medicine Residency, including serving a fourth year as Chief Resident. During the two-year OEM training, in addition to completing his MPH degree from the YSPH and required rotations, Brian pursued his interests in preventing work stress and burnout in physician trainees, as well as educating primary care physicians in OEM. Brian implemented and evaluated an intervention to assist medical residents impacted by psychological burnout (manuscript submitted). With funding from the Association of Occupational and Environmental Health Clinics (AOEC) and an educational grant from the Yale Department of Medicine he developed educational modules and materials focused on educating clinicians and patients on several OEM topics including: OEM history taking, managing the impacts of floods and climate change, and workers compensation and disability. Dr. Linde was recruited to join our faculty after completing his training, based primarily at the VACT.

Presentations: Poster Presentation: AOHC Denver, CO, Spring 2017. Title: Evaluation of a Wellness Visit Program to Prevent Burnout in Internal Medicine Residents.

Session Presentation: Dr. Brian Linde, Dr. Lefkowitz and Dr. Pensa. AOHC, New Orleans, LA, Spring 2018

Title: Educating Underserved Communities in Environment Health Risks"

Publications: see below

Board Certification: Internal Medicine, Preventive Medicine – Occupational Medicine

Current position: Chief of the Occupational Health Department, VACT Medical Center, Instructor at the Yale School of Medicine, and Associate Program Director, Yale OEM Residency Training Program.

Daniel Stopka, MD, MPH (July 2016 – June 2018)

Dr. Daniel Stopka earned his medical degree from the Chicago Medical School and initially pursued rehabilitation medicine until deciding to pursue OEM. During his two-year OEM training, in addition to completing his MPH degree from the YSPH and required clinical and elective rotations, Dan used evidence-based methods to help update VACT's Employee Health/Infection Control Manual and also helped to streamline tracking and surveillance of employees potentially exposed to tuberculosis at the VACT. Recognizing the need for OEM expertise within the VA system, Dr. Stopka sought an OEM position at a VA closer to his family in the mid-west.

Board Certification: Preventive Medicine – Occupational Medicine

Current position: Chief of the Occupational Health Department at the Aleda E. Lutz VA Medical Center in Saginaw, Michigan.

Jessica Deslauriers, MD, MPH (July 2017 – June 2019)

Dr. Jessica Deslauriers received her MD from University of South Florida and completed Yale's Internal Medicine Traditional Residency Program. During her highly productive two-year OEM training, in addition to receiving her MPH degree and completing all required activities, Dr. Deslauriers pursued several research, public health and educational projects. In collaboration with Dr. Eric Garshick, Dept Environmental Health, Harvard Chan SPH and Boston VA, she analyzed air sampling data from 131 households to evaluate determinants of indoor carbonaceous aerosols. She also was selected to participate in Yale's Fellows as Medical Educators Program. She gave several educational sessions on occupational health topics for Yale medical residents and primary care providers.

Selected Presentations: Yale Traditional Internal Medicine Program Noon Conference, education session titled: Occupational Lung Disease, New Haven, CT, October 2 and October 6, 2017

Veteran's Affairs Center of Excellence in Primary Care Education teaching session, titled: Occupational and Military Exposures, West Haven, CT August 25 and September 22, 2017

Publications: see below

Board Certification: Internal Medicine, Preventive Medicine – Occupational Medicine

Current position: Assistant Professor of Internal Medicine at the University of Central Florida College of Medicine. Ambulatory Care Physician, Employee Health and Primary Care, Orlando VA Healthcare System in Florida.

Efia James, MD, MPH, (July 2017 – June 2019)

Dr. Efia James received her BS and MD degrees from Howard University. After graduating from the Yale Internal Medicine Primary Care Residency Program, she gained experience with disability evaluations for the VA and the State of Maryland, while also completing her MPH degree at George Washington Univ. During her 2 yr Yale OEM training Dr James rotated with CT OSHA where she developed a Workplace Fatality Assessment and Control Program in collaboration with the CT Dept of Public Health. Dr. James was also selected to participate in Yale's Fellows as Medical Educators Program for fellows interested in pursuing clinical, educational and public health careers. She worked on several outreach projects, including an educational workshop on machinists and metal working fluids at the Annual Connecti-COSH Health & Safety Meeting. Dr. James was recruited to join our faculty after her OEM residency.

Presentations: New England College of Occupational and Environmental Medicine (NECOEM) Conference, Boston, MA Dec. 2017. Titled "Uranium dust exposures in a military Veteran"

Publications: see below

Board Certification: Internal Medicine, Preventive Medicine – Occupational Medicine

Current position: Instructor, Department of Medicine, Yale School of Medicine. Attending Physician, Occupational Health Services, VACT Medical Center. Service Chief, VISN 1 Employee Health Unit, VA.

Khaula Khatlani MBBS (MD), Msc, (July 2018 – June 2020)

Dr. Khaula Khatlani graduated from Dow Medical College, Pakistan and then completed an NIH Fogarty Fellowship and MSc in Epidemiology & Biostatistics at Johns Hopkins Bloomberg School of Public Health. After completing the Yale-Griffin Hospital Preventive Medicine Residency, she sought more formal OEM training. Her research has focused on workplace violence and related injuries reported through the Yale-New Haven Hospital injury database. She characterized these injuries and their predictors among emergency department employees, and presented her findings at the AOHC and NECOEM.

Presentations: NECOEM Conference, Boston, MA November 29, 2018. Title: Evaluating Parkinson's Disease Risk in Retired Military Petroleum Specialist: A Scoping Review

AOHC April 29, 2019. Abstract oral presentation titled "Workplace Violence Injuries among Emergency Department Employees: Results from a Tertiary Care Hospital in Connecticut".

Awards: 2019 ACOEM Underserved Occupational Populations Section Scholarship.

Board Certification: Public Health & General Preventive Medicine, will be taking Occupational Medicine Board exam Oct 2020

Current position: Medical Director, Occupational Health Clinic of the Bristol Health Medical Group, Bristol, CT. She is also continuing her work on workplace violence in healthcare workers.

Louis Fazen, MD, PhD (July 2018 – June 2020)

Dr. Louis Fazen received his MD and PhD (in Public Health and Epidemiology) from the Yale Schools of Medicine and Public Health and then completed Yale's Internal Medicine Residency Program. During his OEM residency Dr. Fazen pursued his research interest in organizational structure and work-related stress. During an elective with the NYC Dept of Public Health (with Yale IRB approval) he interviewed worker owned business members in collaboration with the Democracy at Work Institute (DAWI) and the NYC Network of Worker Cooperatives (NYC NOWC) to better understand their organizational structure, work stresses, and benefits. This work formed the basis of Dr. Fazen's pilot funding from NYNJ NIOSH ERC to pursue a mixed-methods study of worker cooperatives, in collaboration with Paul Landsbergis, PhD, EdD, MPH, SUNY Downstate. Dr. Fazen has also worked on projects in response to the COVID-19 pandemic. In collaboration with Drs. Redlich, Wisniewski and his co-residents, he designed and implemented an epidemiology study of health care workers at risk for COVID-19 to better understand risk factors. Over 1200 Yale, YNHH, and VA healthcare workers have been recruited, enrolled, completed baseline questionnaires and had SARS-CoV2 serology performed using COVID-19 quantitative ELISA serology assays developed in the Wisniewski / Redlich lab.

Publications: see below

Board certification: Internal Medicine, will be taking Occupational Medicine Board exam Oct 2020

Current position: Instructor, Department of Medicine, the Yale School of Medicine. Attending Physician, Occupational Health Services, West Haven, CT VA Medical Center

Queenie Abad, MD, (July 2019 – June 2021)

Dr. Queenie Abad received her medical degree from the University of Texas Southwestern Medical Center. She became interested in OEM while completed the Yale Primary Care Medicine Residency Program. During her elective time, she performed a health survey of Philippino Seafarers in collaboration with Dr. Lefkowitz, which she is writing up for publication. After seeing a child with an elevated lead level Dr. Abad became interested in the obstacles to preventing childhood lead poisoning. She worked with the Yale Regional Lead Treatment Center to design educational visual aids to recognize lead hazards and provide information on local funding resources for lead abatement. Dr. Abad has also worked on several other community and workplace projects, including one to evaluate the extent of past workplace exposures in Department of Public Works (DPW) employees and perform an overall risk assessment. With the COVID-19 epidemic, Dr. Abad has been central to several COVID-19 educational and research projects. She has helped coordinate the COVID-19 serology study of health care workers and created educational materials on how to minimize risk of COVID-19 for themselves and family members. She has also coordinated a seroprevalence study of over 1,000 Mohegan Tribe team members to

assess the prevalence of prior COVID-19 infection and risk factors in this at-risk workforce.

Presentations: Dr. Abad worked with Dr. Redlich on presentations to a number of industries on topics related to workers health and safety and COVID-19 transmission, as well as prepared educational materials for different at-risk workers such as Yale Residents, K-12 Cafeteria Workers, Hairdressers and Barbers.

NECOEM Conference, Boston, MA December 6, 2019. Title: Filipino Seafarers and their Impact on Family Wellness

Publications: see below

Current position: Internal Medicine Clinician/Educator UT Health, San Antonio, TX

Joseph Zell, DO, MS, MBA (July 2019 – June 2021)

Dr. Joseph Zell received his medical degree from Ohio University Heritage College of Osteopathic Medicine and completed Family Medicine residency. Dr. Joseph Zell has been working closely with the CT Army and Air National Guard to advise on their COVID-19 pandemic response and increase testing capacity across CT. He has enrolled over 1,000 CT National Guard in a longitudinal COVID-19 seroprevalence study to better understand the extent of disease and risk factors in this critical workforce, and with follow-up, also the duration of the immune response. All serology assays are being performed by the Yale OEM laboratory. Dr. Zell has also developed statewide testing protocols for first responders, implemented contact tracing protocols within the CT National Guard, and assisting CT employers implement safe return to work protocols and testing strategies.

Presentations: The Future of Recycling at the Human-Robot Interface February 17-18, 2020, Yale University Robotic implementation of recycling and the human interface. Part of the development and discussions around implementing robotic involvement in the recycling industry.

Publications: see below

Current position: Health Center Director, General Motors, Lansing Complex, Lansing, MI

Richard Smith, (July 2020 – EDC June 2022)

Dr. Richard Smith received his medical degree from University of Vermont College of Medicine and is a graduate of the Yale Primary Care Internal Medicine Residency Program. He is enrolled as MPH student at the Yale SPH. Since recently beginning the training Richard has rotated at the West Haven VA, YNHH, and OEM Clinic and gone on several site visits. Richard has been involved multiple research projects including a serology study for COVID-19 (which has resulted in one publication) as well as a projects regarding return-to-work status among individuals with long term covid. He has also been working closely with the pulmonary department to recruit individuals for a study about return-to-work status and disability.

Publications: see below

Romero Santiago, (July 2020 –EDC June 2022)

Dr. Romero Santiago received his medical degree from the University of Texas Southwestern Medical School and completed Family & Community Medicine Residency at the University of California Davis Health System. He also holds an MPH degree from the University of Texas School of Public Health Dallas. Through his training he has had the opportunity to participate in clinical work activities at Yale, including managing the health system's COVID-19 employee hotline, and the Connecticut VA Employee Health. As well as participation in home and workplace site visits with the program's industrial hygienist and has received extensive clinical education on various types of exposure assessments, in addition to the legal aspects of OEM. He participated in an elective rotation at Lincoln Financial to learn about disability claims under the supervisor for Dr. David Berube. He is also involved in evaluating the implementation of a new electronic tracking system for flu vaccinations at VACT. He is activity involved in a longitudinal program initiative involving COVID-19 serology surveillance for both Yale healthcare workers as well as employees at the Mohegan Sun casino. This past summer, he did a virtual rotation with Federal OSHA and am working with them on a longitudinal project regarding carbon monoxide inspections.

Publications: see below

Publications

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