Yale SCHOOL OF MEDICINE

Building Capacity for the Primary Care Pipeline to Recognize OEM conditions

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Learning Objectives

- Identify the need for occupational and environmental medicine(OEM) knowledge and skills among the primary care workforce
- Assess an OEM teaching model for primary care residents

Background/Rationale

Health … connotes rather a way of functioning within one's environment (work, recreation, living). It not only means freedom from pain or disease, but also freedom to develop and maintain one's functional capacities. Health develops and is maintained through interaction between the genotype and the total environment. (WHO Study Group, 1975)

The work environment constitutes an important part of man's total environment, so health is to a large extent affected by work conditions.

Background/Rationale

The contribution of environmental and workplace factors impacting health and disease is substantial, and yet there exists an educational gap in this area.

The **Institute of Medicine** convened a panel of experts, the Committee on Curriculum Development in Environmental Medicine.

Their report calls for the fulfillment of **six competency-based learning objectives** including:

- understanding the influence of the environment and environmental agents on health
- the ability to elicit an environmental exposure history
- the ability to access resources to address patient environmental health concerns

Background/Rationale

The Physicians Foundation 2018 Physician Survey

- Survey of nearly 9,000 physicians across the country
- A biennial ”State of the Union” for the profession (and healthcare system)

- **87.9 percent** of physicians reported that either all, many, or some (versus few or none) of their patients were affected by **social determinants** that pose serious impediments to their health.
- **”Many physicians believe that their ability to do what they are trained to do … is being circumscribed by external forces.”**

Background/Rationale

ATSDR C.S.E.M.: Taking an Exposure History

Primary care providers see an estimated 80% of occupational and environmental-related illness.

NIOSH: A Smarter National Surveillance System for Occupational Safety and Health in the 21st Century

-NIOSH interested in incorporating occupational information into the electronic health record

-Anticipated benefits: improve care, reduce health disparities, engage patients in their care, improve population/public health

Aim

To develop and implement a skills-based primary care curriculum including:

a) an overview of the major environmental and workplace health exposures,

b) skill development in occupational and environmental history-taking, and

c) resources to help residents mitigate their patients' environmental and workplace health exposures

Curriculum Overview

Conducted during ambulatory block for Yale Primary Care Residents (PGY1-PGY3):

- A 4-hour session, roughly 15 students per session
- Repeated annually *(3 unique sessions with overlap)*
- Didactic approach: Combination lecture/skills development

Curriculum

- **Session One (2017-2018)**
- **Intro:** What is OEM? Toxicants at Work / in Environment – Health Burden; Exposure History Fundamentals
  - In focus: climate change and air pollution
- **Skills:** Taking an OEM history, case-based (exposure)
- **Resource Awareness:** OSHA, NIOSH, ATSDR, AOEC
- **Skills:** Disability Evaluation

- **Session Two (2018-2019)**
- **Intro:** Review of What is OEM? Exposure History
  - In focus: heat-related illness and wildfires
- **Skills:** Back injury- acute and chronic management; stay at work / return to work framework, basic ergonomics
- **Resource Awareness:** Job Accommodation Network
- **Skills:** Navigating Workers Comp System

- **Session Three (2019-2020)**
- Currently In Development
- Topics Planned:
  - Review of OEM history taking / resources
  - Total Worker Health
  - Mental Health in the Workplace
  - Working with the local/regional Department of Public Health (addressing disparities)
  - Patient testimonial

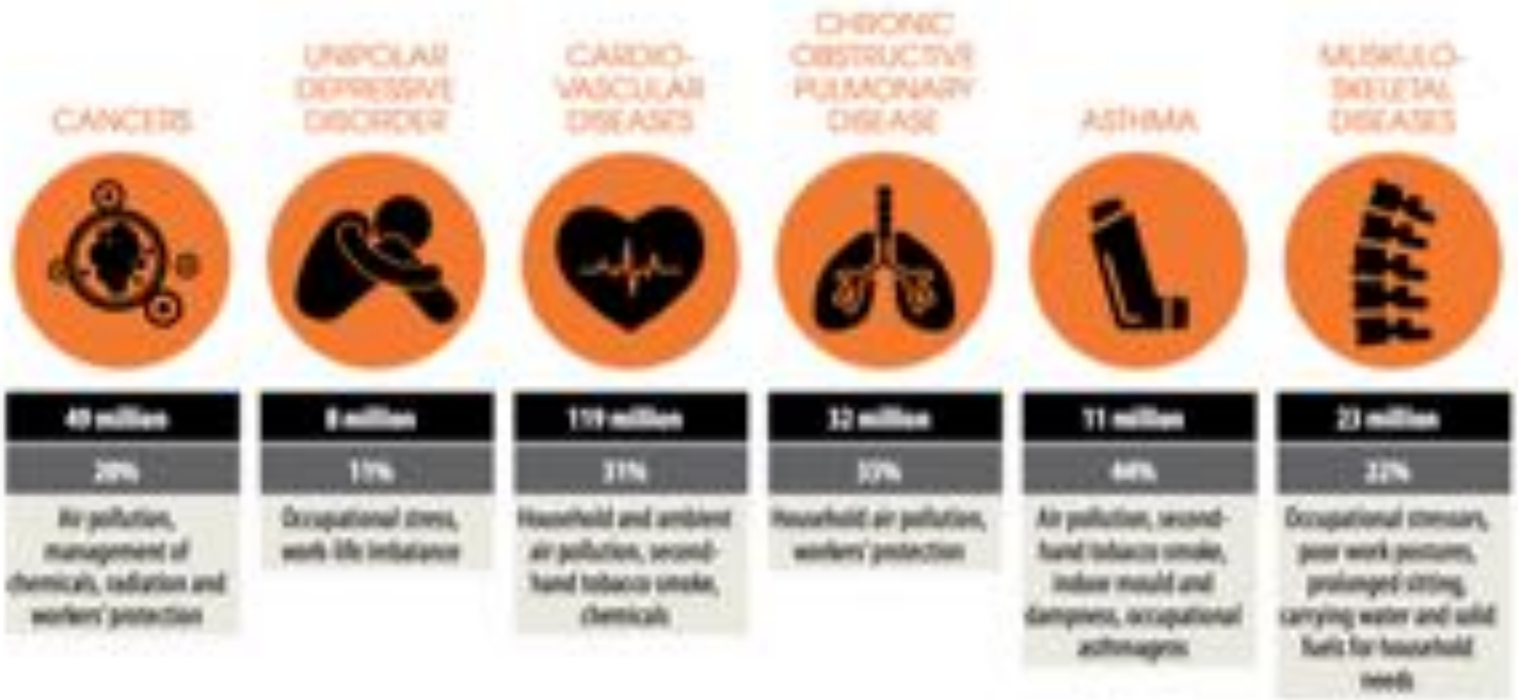
Example Session Material

Intro to OEM

Approach to History Taking

Skills Exercise

Diseases with Highest Preventable Burden from Environmental Risks



1. The Quick Survey

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Chief Symptom and History of Present Illness

- "What kind of work do you do?"
- "Do you think your health problems are related to your work?"
- "Are your symptoms better or worse when you're at home or at work?"

Review of Systems

- "Are you now or have you previously been exposed to dusts, fumes, chemicals, radiation, or loud noise?"

2. Detailed Questioning Based on Initial Suspicion

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Self-Administered Questionnaire for All Patients (Table 1)

- Chronology of jobs
- Exposure survey

Review of Exposure, with the Questionnaire as a Guide

- More about the current job: description of a typical day
- Review of job chronology and associated exposures

Examination of the Link between Work and the Chief Symptom

- Clinical clues (Table 2)
- Exploration of the temporal link in detail
- "Do others at work have similar problems?"

Table: Organ Systems Often Affected by Toxic Exposure

Organ/ System	Exposure Examples
respiratory	asbestos, radon, cigarette smoke, glues
skin	dioxin, nickel, arsenic, mercury, cement (chromium), polychlorinated biphenyls (PCBs), glues, rubber cement
liver	carbon tetrachloride, methylene chloride, vinyl chloride
kidney	cadmium, lead, mercury, chlorinated hydrocarbon solvents
cardiovascular	lead, carbon disulfide, arsenic, cadmium, ozone, vinyl chloride, carbon monoxide, noise, tobacco smoke, physical stress, nitrates, methylene chloride
reproductive	lead, carbon disulfide, methylmercury, ethylene dibromide, polychlorinated biphenyls
hematologic	arsenic, benzene, nitrates, radiation
Neuropsycho-logical	tetrachloroethylene, mercury, arsenic, toluene, lead, methanol, noise, vinyl chloride

Example Case

Case Stem: 32 year-old male with mild intermittent asthma presents with exacerbation

Skills Practice: Residents perform exposure history (eg "has anything changed in your home or work environment?")

- Scenario 1: Change in work processes/exposures→ Isocyanate asthma
- Scenario 2: Family members are affected, water intrusion in home→ Mold

Objective: Through this process, residents learn to take an OEM exposure history

Evaluation

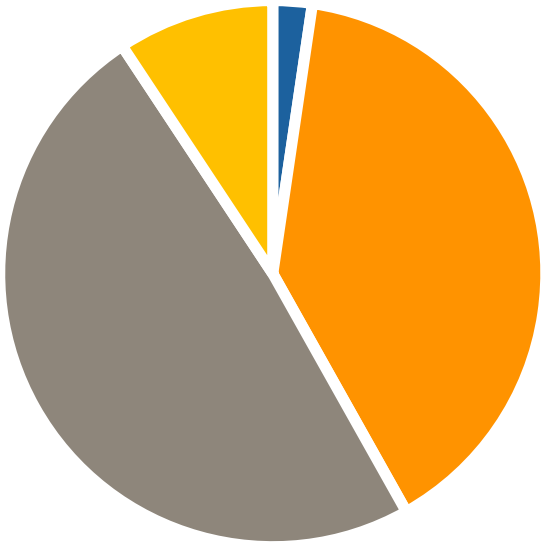
Pre- and post-course assessment surveys measuring knowledge, skills, and attitudes in OEM competencies completed by participants

Evaluation Response

- Year 1
  - Pre-assessment: 43 participants/ respondents
    - 17 PGY 1
    - 11 PGY 2
    - 15 PGY 3
  - Post-assessment: 38 respondents
    - 12 PGY 1
    - 12 PGY 2
    - 14 PGY 4
- Year 2 (in progress)
  - Pre-assessment: 15 participants/ respondents
    - 3 PGY 1
    - 5 PGY 2
    - 3 PGY 3
  - Post-assessment: 11 participants

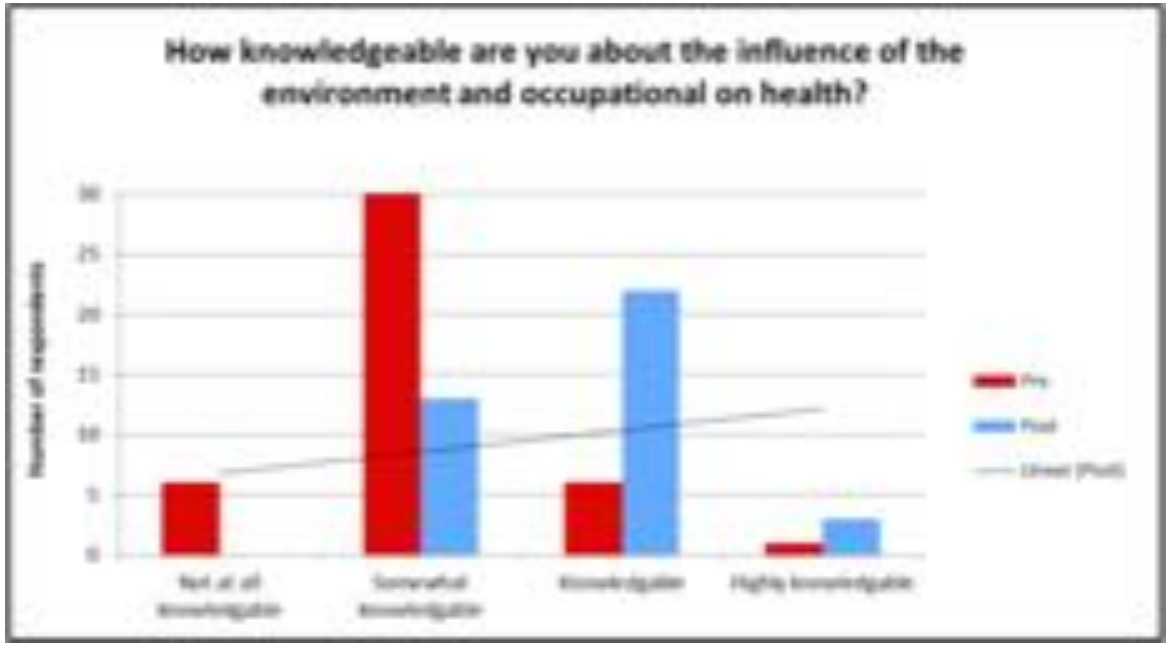
Results

How essential to your future career are skills in obtaining an environmental exposure history, including a work history, from your patients?

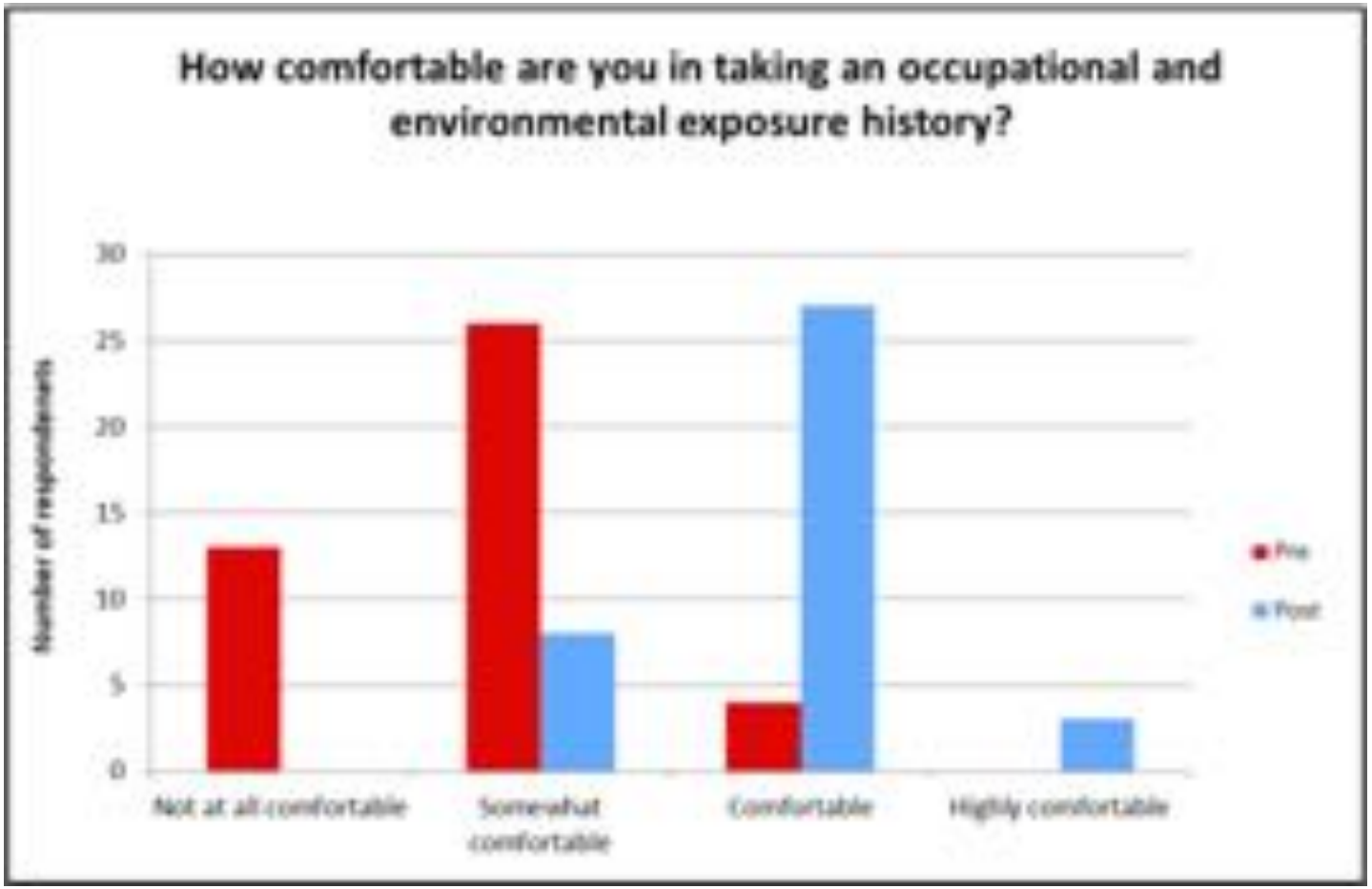


How essential to your future career are skills in recognizing and managing a health condition that may impact a patient's ability to perform their job?

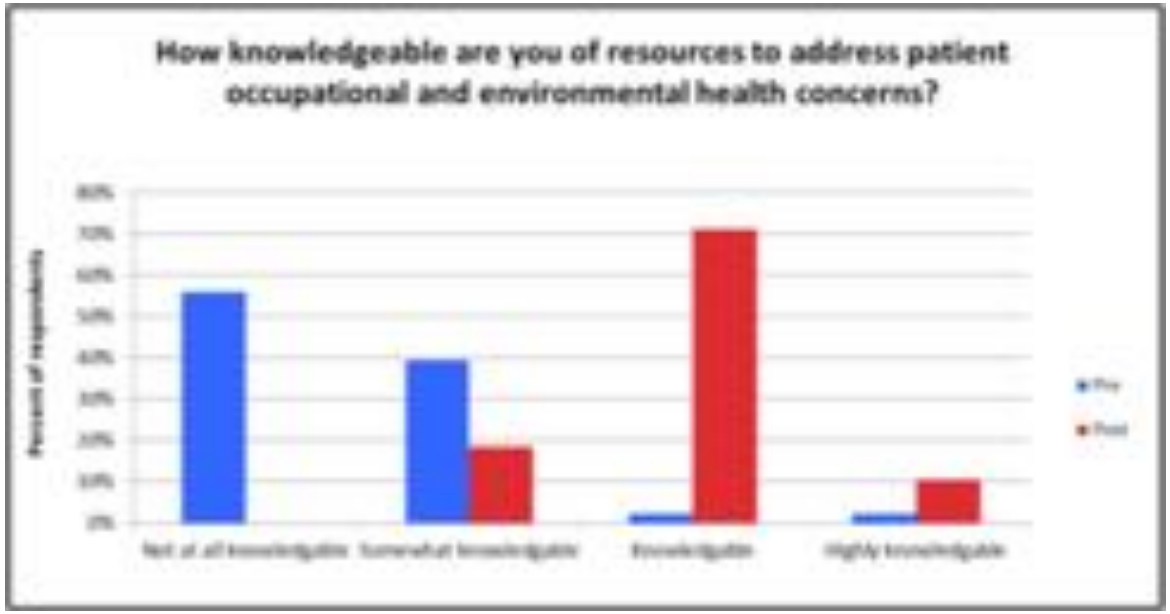
Results


How knowledgeable are you about the influence of the environment and occupational on health?

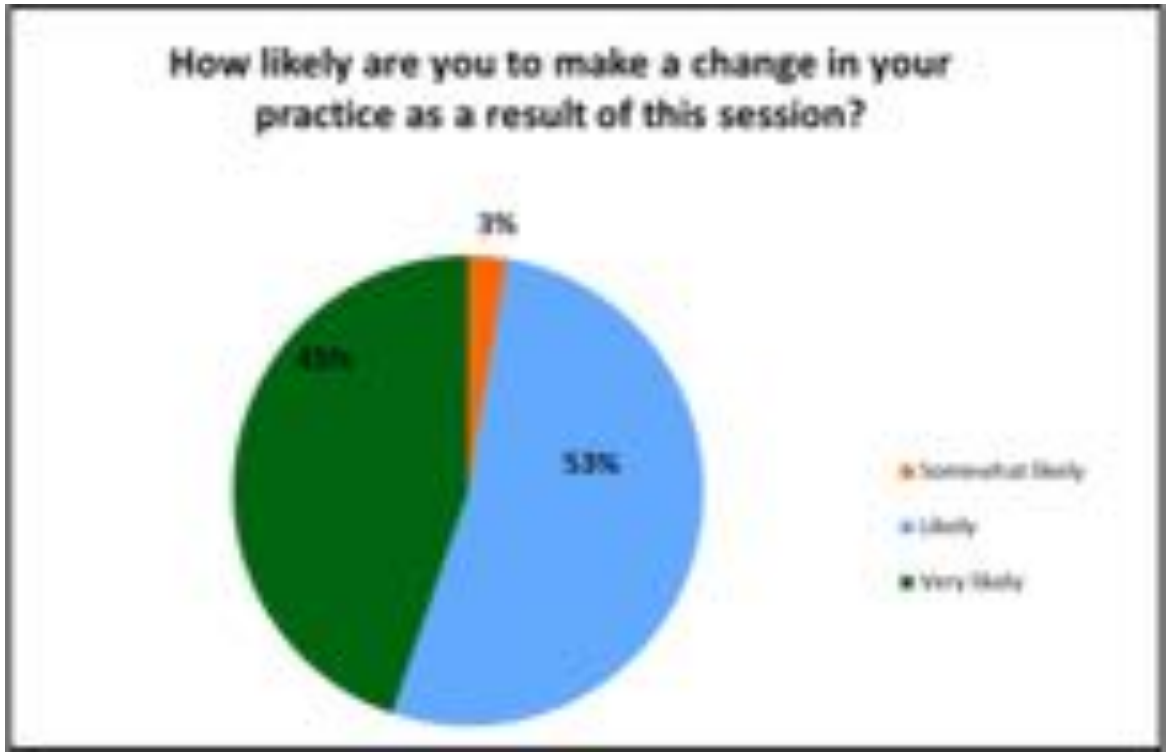
Results


How comfortable are you in taking an occupational and environmental exposure history?
Number of respondents
30
25
20
15
10
5
0
Not at all comfortable
Somewhat comfortable
Comfortable
Highly comfortable
Pre
Post

Results


How knowledgeable are you of resources to address patient occupational and environmental health concerns?

Results


How likely are you to make a change in your practice as a result of this session?
3%
45%
53%
Somewhat likely
Likely
Very likely

Next Steps

- Analyze pre-survey data from year to year
  - Have attitudes, skills, knowledge changed longitudinally?
- Implement OEM EHR tools
  - Return to work letter
  - OEM history tab/flowsheet
- Assess OEM exposure assessment at bedside
  - Observations
  - Patient simulation

End Goal

- Put access to OEM knowledge at the front-lines
- Enhance recognition of occupational and environmentally related disease

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Thank you!