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Developing Occupational and Environmental Medicine Curricula for Primary Care Residents: Project EPOCH-Envi

Frazier, Linda M. MD, MPH; Berberich, Norbert J. PhD; Moser, Royce Jr MD, MPH; Cromer, John W. Jr MD, MSPH; Hitchcock, Maurice A. EdD; Monteiro, F. Marconi EdD; Greenberg, Gary N. MD, MPH

Author Information

From the Division of Occupational and Environmental Medicine, Department of Community and Family Medicine (Dr Frazier, Dr Cromer, Dr Greenberg), and the Division of Education, Department of Community and Family Medicine (Dr Hitchcock, Dr Monteiro), Duke University Medical Center, Durham, NC; the National Institute for Occupational Safety and Health, Cincinnati, Ohio (Dr Berberich); and the Rocky Mountain Center for Occupational Safety and Health, University of Utah, Salt Lake City, Utah (Dr Moser).

Preliminary results of this work have been presented at professional meetings (see references 13 through 21).

The opinions expressed are those of the authors and not of the National Institute for Occupational Safety and Health.

Address correspondence to: Linda M. Frazier, MD, MPH, Department of Preventive Medicine, University of Kansas School of Medicine-Wichita, 1010 N. Kansas Avenue, Wichita, KS 67214.

Abstract

To help primary care residency programs develop or improve residency curricula in occupational and environmental medicine, the National Institute for Occupational Safety and Health launched a train-the-trainer initiative. This project was called EPOCH-Envi (Educating Physicians in OCcupational Health and the Environment). From 1990 to 1996, 46 2-day curriculum development workshops were held. These featured (1) guidelines on how to plan, implement, and evaluate a curriculum, (2) continuing education on occupational illnesses and injuries, (3) a worksite or environmental site visit, and (4) information resources. A total of 435 faculty from 305 residency programs participated, representing 42.5% of the family practice residencies and 24.9% of the internal medicine residencies in the United States. A survey conducted among attendees (60.4% response rate) 17 months after their workshop revealed that 65.6% of respondents had added lectures on occupational and environmental topics to the residency curriculum. Other curriculum improvements were also made. Primary care physicians manage most patients with occupational and environmental health problems or concerns. Providing technical assistance specifically designed to support occupational and environmental health education in primary care residencies can have a positive impact on curriculum content.

Occupational and environmental medicine (OEM) training for primary care residents would help prepare these physicians for an important component of their medical careers. Family physicians in Oregon have reported that occupational medicine constitutes approximately 14% of their practices.[1] Physicians in Connecticut have said that increasing numbers of patients are asking them about environmental health risks popularized by the media.[2] Occupational injuries and illnesses are not rare. Approximately 6500 job-related deaths and 13.2 million nonfatal occupational injuries occur in the United States each year, and occupational illnesses may affect as many as 862,200 Americans annually.[3]

Primary care physicians are the first and usually the only clinicians who see patients with occupational and environmental health problems or concerns.[3-7] OEM training has traditionally received limited emphasis in the medical school curriculum.[8,9] Accreditation criteria for family medicine and internal medicine residencies, however, have required or encouraged OEM training for many years.[10] The EPOCH-Envi (Educating Physicians in OCcupational Health and the Environment) project was developed by the National Institute for Occupational Safety and Health (NIOSH) to assist primary care faculty to develop or improve their residency curricula in OEM. This article reports the approach used and the outcomes from the project.

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Methods

The EPOCH-Envi project began in 1987 when NIOSH and Duke University began to explore methods to improve occupational history-taking among medical students and primary care residents. OEM faculty members from nine universities were brought together to discuss the methods that they had used to improve OEM training at their own institutions. These universities held preliminary curriculum development workshops for primary care residency training programs in their regions. At a consensus conference, these faculty reviewed the experience with the first workshops and established a model 2-day workshop format containing four components. The four key elements were (1) guidelines on how to plan, implement, and evaluate a curriculum, (2) continuing medical education on occupational and environmental health topics, (3) a worksite visit, and (4) OEM information resources. The project did not aim to develop new curriculum materials. Emphasis was placed on using existing, readily available materials such as textbooks and OEM curriculum recommendations from the American Academy of Family Physicians and others.[11] By 1990, the EPOCH-Envi project was formally established as an initiative to improve OEM curricula by providing training for primary care faculty, primarily in family medicine and internal medicine residencies. A teach-the-teacher strategy was chosen so that contact with a limited number of primary care faculty could result in improved training for many resident physicians.

Through a competitive grant process, NIOSH selected two centers in 1991 to coordinate future EPOCH-Envi training activities. The University of Utah served the Rocky Mountain and western United States regions from 1991 to 1994. Duke University served the eastern and midwestern United States from 1991 to 1994 and was the coordinating center for the nation from 1994 to 1996. Each US state was placed in one of 11 geographic regions, with the goal of recruiting an academic OEM program to conduct at least one workshop in each region. Workshops were planned throughout the United States instead

of at a central location to foster networking between primary care faculty and OEM experts in the region. These regional coordinators were responsible not only for planning and conducting the workshops but also for recruiting the primary care faculty attendees and for collecting evaluation data. Scholarships were provided to attendees to partially offset the cost of travel to the workshops. The project also provided some funding for the administrative costs of the regional coordinators, but it relied to a great extent on volunteerism by academic OEM faculty.

To assess the proportion of primary care residency training programs that participated in the project, the total number of US residency training programs was obtained from the *Graduate Medical Education Directory* at the midpoint of the project.12 This resulted in the exclusion from analysis of one participating internal medicine residency program that closed before 1993 and two participating family medicine residency programs that opened after 1994.

Needs assessment data were collected from a 1-year sample of attendees early in the program (fiscal year 1991-1992) to help target teaching initiatives. We developed a skills self-assessment form on which attendees were asked to rate their expertise prior to attending the workshop, using a five-point scale, for 16 items related to OEM curriculum development. They also were asked to assess their skill level at the close of the workshop. Although the workshops usually provided information on workers' compensation and disability management, there was no emphasis on methods to treat specific occupational injuries. On the needs assessment, the question about providing primary care for occupational injuries was intended to serve as a control question to assess attendees' potential tendency to over-rate their improvement from participating in the workshop.

Several program evaluation methods were assessed. After the 1990 workshops, each participating residency program in North and South Carolina was visited to obtain follow-up data about the impact of the project on residency curricula. After the 1991 workshops, a 30-minute structured telephone interview was conducted with each attendee from North and South Carolina 6 and 12 months after the workshop. Through these pilot evaluation activities, we identified core outcomes to assess, as well as how long it takes for attendees to modify their residency curriculum (typically 12 to 18 months). Primary care faculty attendees reported that they did not have time to provide extensive evaluation data such as knowledge assessments among residents nor audits of medical records. We then developed a two-page survey and mailed it approximately 18 months after the workshops to a 2-year sample of attendees (during fiscal years 1991-1992 and 1992-1993). A second mailing was sent to nonrespondents.

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Results

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Regional Workshops

Academic OEM faculty were successfully recruited to coordinate workshops in each of the 11 designated US regions except for the northern Midwest (North Dakota, South Dakota, Nebraska, Iowa, Minnesota, and Wisconsin); faculty from residencies in these states were invited to attend workshops in other regions. From 1990 to 1996, 435 faculty from 305 residency programs participated in 46 workshops. Among family medicine residencies, representatives from 170 of 400 programs (42.5%) attended. Among internal medicine residencies, representatives from 104 of 417 programs (24.9%) attended. Also

attending were Representatives from 18 obstetrics-gynecology programs also attended, as well as those from seven emergency medicine programs and six preventive medicine programs.

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Educational Needs Assessment


Table 1

During the sample year, 65 of 76 workshop attendees (85.5%) completed skills self-assessments (Table 1). Before attending the workshops, the primary care faculty were least confident in their ability to design, implement, and evaluate the effectiveness of an OEM curriculum. They were most confident of their ability to provide primary care for on-the-job injuries and to maintain sensitivity to ethical constraints and confidentially in OEM. Attendees judged that their skills had improved in the domains emphasized during the workshops (Table 1).

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Curricular Changes


Table 2

During the 2-year period when the sample of attendees was contacted for follow-up data, 149 primary care faculty attended the workshops. By the time of the survey (a mean of 18.8 months after the workshop; median, 17 months), 15 of these faculty were no longer working at the residency program they had represented (10% turnover). Ninety of the 149 attendees (60.4%) completed the follow-up surveys (Table 2).

Workshop attendees enriched their resident libraries by adding reference materials on OEM (Table 2). Most programs planned to increase their emphasis on OEM through precepting, especially occupational history-taking. It was uncommon for programs to systematize occupational and environmental history-taking by adding prompts to history and physical forms. Only a few residencies were able to take residents on worksite or environmental site visits. Most often (65.6% of the time), the primary care faculty implemented new lectures covering occupational and environmental health topics. Lectures constituted 64.3% of the total curriculum hours devoted to OEM. The number of lecture hours over the 3 years of residency increased from a median of 5 hours beforehand to a median of 9 hours after participation in the workshop (Table 2).

Attendees indicated that the most helpful aspects of the workshops were the sessions on how to develop a curriculum, the information resources provided, and the opportunity to network with other primary care faculty who are developing OEM curricula. Five attendees, however, felt that the curriculum development sessions were the least helpful aspect of the workshops.

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Other Activities

In addition to the routine educational service activities conducted by Duke University and the University of Utah, an explicit attempt was also made to reach curriculum planners in primary care residencies outside the context of the 2-day EPOCH-Envi workshops. Abstracts and mini-workshop proposals on OEM curriculum development were submitted to primary care professional organizations. Both of the submissions to the Society of Teachers of Family Medicine were accepted for presentation.[13,14] The submission to the Association of Program Directors of Internal Medicine was accepted as a poster.[15] Three of the submissions to the Society for General Internal Medicine

were rejected for presentation but published as abstracts,[16-18] one was selected as a poster,[19] and two were accepted as mini-workshops.[20,21] The attendance at presentations other than the posters was low, ranging from a minimum of five primary care faculty at a Society for General Medicine presentation [20] to a maximum of 19 primary care faculty at a Society of Teachers of Family Medicine presentation.[13]

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Discussion

The EPOCH-Envi project accomplished the objectives it was designed to meet. The project made a substantive continuing medical education contact with 305 residency training programs representing 42.5% of all family practice residencies and 24.9% of all internal medicine residencies in the United States. These residency teachers improved their OEM skills according to self-report, and they increased the amount of OEM teaching provided to their residents.

This project has several limitations. The response rate to the survey on curricular changes implemented after the workshops was 60.4%. Although this is a fairly good response rate for surveys of physicians, non-response could produce selection bias. To estimate the worst-case scenario for curricular changes associated with the project, lectures could be examined because they are relatively simple to count. Of the 90 programs whose representatives responded to the survey, 59 had implemented new lectures on OEM (59 of 90, or 65.6%). Even if only 59 of the 149 total programs in the sample years implemented new OEM lectures, 39.6% of the programs still would have implemented new lectures (59 of 149, or 39.6%). An impact on the curricula in nearly 40% of the residency programs represents a large positive step toward improvement of OEM curricula in primary care residencies.

Continuing medical education may improve physician knowledge but patient care practices and patient outcomes may not change.[22,23] Measuring patient outcomes is expensive. This probably explains why published studies of continuing medical education interventions report the impact on patient outcomes only 7% of the time.[24] EPOCH-Envi's goal was to reach as many primary care residency programs as possible. To finance an evaluation of health outcomes, a drastic reduction in the number of workshops offered annually would have been needed. EPOCH-Envi facilitated OEM curriculum development by demonstrating methods that primary care faculty could use to enable their residents to improve their skills in OEM. These enabling methods included sharing the teaching approaches and curriculum materials used by other residency programs, providing contacts with regional OEM specialists who could assist with care of complex patients, and allowing attendees to practice retrieving OEM information efficiently. It is likely that the project was more powerful than the reviews of pathophysiology and treatment approaches that are found in traditional continuing medical education courses. In randomized controlled trials, researchers have documented that continuing medical education programs that use practice-enabling or reinforcing strategies consistently improve physician performance and, in many cases, health care outcomes.[25]

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Conclusions

OEM is a complex endeavor that may best be learned in patient-care settings under the guidance of an experienced mentor. The

resident is a more advanced learner than the medical student and is perhaps better poised to develop specific skills in this domain. OEM training is required in family medicine and internal medicine residency training programs.[10] Now that the EPOCH-Envi program is finished, to whom can these teachers turn for technical assistance?

Many sources of OEM information are now available on the Internet. For the exceptional primary care faculty member with a strong interest in this topic and plenty of time, these resources will be helpful. In some states, local educational initiatives have been launched by individual university-based programs.[26,27] Our experience suggests that OEM training for primary care residents does not appear to be a priority in primary care professional organizations. The National Institute for Environmental Health Sciences and the Agency for Toxic Substances and Disease Registry supported EPOCH-Envi, but their own training initiatives focus on medical students and community practitioners, respectively.[28,29] NIOSH currently provides support for training residents but only for those specializing in occupational medicine. Its Education and Research Centers provide graduate training and continuing education for practitioners who specialize in occupational health and safety.

The American College of Occupational and Environmental Medicine (ACOEM) has a rich selection of educational offerings for physicians, including sessions on diagnosing and treating occupational injuries and illnesses, overviews of information resources, and even lessons on worksite visits.[30,31] NIOSH could choose to reactivate the EPOCH-Envi project or to support primary care residency faculty in using educational activities sponsored by ACOEM and the Education Research Centers. Our experience suggests that several barriers need to be overcome in order to make these educational resources available to primary care residency faculty. Many of our attendees had never heard of ACOEM or NIOSH. The availability of these meetings would need to be advertised in primary care professional journals or by periodic mailings. Our attendees remarked that faculty development in primary care is often underfunded. The registration fees for these meetings would represent a barrier for primary care residency teachers. EPOCH-Envi provided travel scholarships to attendees, and a similar travel scholarship program could overcome this barrier in a future initiative. Offering sessions devoted to specific skills in developing OEM curricula for residents could make these educational meetings more attractive to primary care faculty. Formal mechanisms to facilitate networking among those who teach primary care residents would also be attractive.

As we address our national need for occupational medicine specialists and for introducing medical students to OEM,[4,5,8,9] we must also recognize the importance of preparing primary care residents to care for the large number of patients who will present to them with occupational and environmental health problems and concerns. The EPOCH-Envi project demonstrated that residency faculty will take advantage of technical assistance and will use the skills developed to improve OEM curricula.

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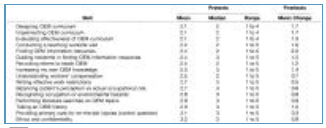

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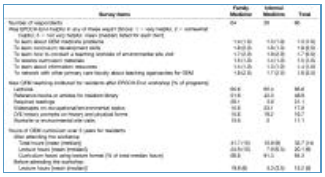

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