

Virtual Mentor

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Medical education

The state of research in medical education

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Ever wonder what the evidence is to support how you spend your time in medical school? And what is a “good” doctor anyway?

The developing field of medical education has raised these and a host of other questions about the goals and efficacy of the medical school curriculum.

What are the core competencies physicians must be able to demonstrate? How do we assess these competencies? What instructional strategies work best to ensure that all physicians meet them? As members of medical school faculty are we striving to prepare *competent* physicians or *masterful* physicians? How can we ensure that practicing physicians continually refine their expertise through deliberative practice (cycles of practice with feedback) like competitive athletes or concert musicians?

What is medical professionalism? How does it develop? Is it independent of cognitive ability? Can we predict unprofessional behavior? If we can predict unprofessional behavior, what is our responsibility to society to do so?

What proportion of the public’s health can be attributed to the work of physicians? Can we improve the quality of care people receive by improving the quality of physician training?

How can we make certain medical students choose careers in the areas of medicine most needed by our population?

These are among the many questions being vigorously debated in the medical education literature. Medical education research is rapidly emerging as an exciting and sustainable career path for academic physicians. Those who choose this path feel passionate about improving the process and outcomes of physician training and choose to do so by, among other things, applying the scientific method to questions raised in that training and using this evidence base to change practice and inform policy. As compared to clinician-teachers, who strive to be master clinicians and instructors, medical education researchers pursue scholarly activities such as designing and conducting research, writing grants to support that research, and publishing reports on new discoveries.

Medical education research is of great importance and interest to our society for many reasons, not the least of which is the public's investment in training. Medical students who pay a huge tuition bill (and accumulate significant debt) might find it surprising that medical training is heavily subsidized by the public. In 2000, Medicare paid \$8 billion for graduate medical education which supported over 100,000 medical residents. This money is made up of both direct payments to hospitals for resident and faculty salaries and indirect payments for the added patient care costs associated with teaching [1, 2]. More than three-quarters of the country's 125 medical schools received public subsidies. In total this is estimated to have been in excess of \$2 billion in the year 2000 [3].

Educational interventions that lead to better outcomes: the cutting edge

Research in medical education has contributed substantially to improvement in the practice of medical education. As compared with the early 1970s we now understand a great deal about the nature of medical expertise, the value of problem-based learning, the clinical learning process, performance assessment, clinical teaching, and the continuing education and assessment of practicing physicians [4]. The structure and content of the undergraduate medical curriculum has changed significantly, guided by this research and in response to major shifts in the health care delivery system, its financing and societal demands [5]. Recent calls for an accounting of the return on investment for medical education have generated interest in evaluating medical education interventions by assessing their impact on the outcome that matters most—patients' health. Yet few studies have been able to directly link educational interventions with clinically important patient-level outcomes [3]. This is the cutting edge for medical education research. In much the same way as we need to practice evidence-based medicine when possible, we need to insist on establishing the evidence base for education, particularly when the stakes are as high as they are in physician training.

Academic medical centers (AMCs) vary greatly in the priority and support they give to this type of research relative to more traditional biomedical research. A few AMCs have thriving research groups, and most AMCs have at least a few faculty members scattered across clinical disciplines conducting this type of scholarship [6]. At New York University School of Medicine we have recently formed the Research On Medical Education and Outcomes (ROME) unit to establish an infrastructure that brings together and supports medical education scholars across primary care disciplines.

While the intellectual facility and rigor needed to conduct medical education research is similar to that employed in biomedical research, education researchers use different tools and conduct their work in very different laboratories. The traditions of medical education research tend to hail from the social sciences, so this research uses the methods and measures most familiar to psychology, epidemiology and related fields [7]. Our laboratories are complex settings like medical schools and hospitals, and our subjects are heterogeneous groups of students, residents and practicing physicians. Given the dizzying complexity of all this, we tend to de-

emphasize reductionist techniques and seek to define the intricacies, using mixed methodological approaches. This makes the work endlessly interesting and dynamic.

Most AMCs and professional organizations are now recognizing the value of medical education research by providing seed grants and developing promotion and tenure criteria which acknowledge and recognize the accomplishments of these scholars. Yet some tension remains about how best to recognize medical education researchers who, like other researchers, spend time conducting research, writing and presenting, albeit with less grant money available and fewer venues for publication. Criteria for educational scholarship have been proposed which broaden traditional definitions of scholarship to embrace excellence in all realms of education including direct teaching [8].

Limited funding: the biggest barrier

The biggest threat to further development of medical education research is limited funding. Only a few sources of grant funds are specifically earmarked for medical education (e.g., the National Board of Medical Examiners' Stemmler Fund, the Josiah P. Macy Foundation), and federal funding for education in general (e.g., the U.S. Department of Education FIPSE [Fund for the Improvement of Postsecondary Education] or the National Science Foundation's education and technology grants) tends to be earmarked for preprofessional education. Medical education researchers have been successful at obtaining external funds by combining interests in fundamental questions about medical education with more fundable interests. Prior to the most recent draconian federal budget cuts, funding for educational innovations to increase the access to medical care for underserved and vulnerable Americans (Human Resources Services Administration Title VII training grants) had been available. Occasionally the National Institutes of Medicine have grant programs hospitable to medical education researchers if the proposal fits an Institute's agenda (e.g., National Library of Medicine's interest in educational informatics), is disease-specific, and addresses health disparities or anticipated manpower shortages.

In parallel to the dwindling of funding from the federal government, there seems to be an emerging interest in medical education research on the part of health care delivery systems, their representatives and insurers (particularly managed care companies). These entities recognize that high-quality medical education research is tightly linked to ensuring cost-effective, high-quality health care to defined populations.

The Research in Medical Education (RIME) group of the Association of American Medical Colleges is one of the most established home base professional organizations for such scholarship in the U.S., and there are similar groups around the world (e.g., Association for Medical Education in Europe). There has been a substantial improvement in the quality of work appearing in peer-reviewed medical education journals (e.g., *Academic Medicine*, *Medical Education*, *Teaching and Learning in Medicine*, *Medical Teacher*, *Medical Education Online*) and a significant increase in educational research appearing in publications in the clinical

disciplines, especially family medicine, general internal medicine, pediatrics and surgery. Increasingly, AMCs are collaborating on large scale experimental and quasi-experimental research, and many opportunities exist to partner across health professions with educator colleagues in nursing, dentistry and allied health professions as well as with general education scholars and cognitive psychologists.

A career for physicians in medical education research, which combines clinical practice, teaching, health care policy and economics, quality management, and scholarship, is now a viable, creative and exciting option for junior faculty in all clinical disciplines despite limited funding. Relevant postgraduate fellowship training is available, and AMCs increasingly are recognizing these career paths. In this unsettling and exciting time of rapid change in the U.S. health care system, medical education researchers, if well positioned and prepared, may have an opportunity to redraw the map of medical training to meet modern realities while preserving the core values of our profession.

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