

Op-Ed

Reforming American Medical Education

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TODAY, MEDICAL EDUCATION IS ANACHRONISTIC. IT REMAINS largely governed by the Flexner model. Yet medical practice itself is in the midst of a transformation as significant as the one that stimulated the Flexner revolution in 1910. All aspects of medical education, from premedical requirements to clinical training, must also transform. Otherwise, tomorrow's physicians will be ill prepared to deliver high-quality care.

Four Trends in Medical Practice and Education

Significant medical advances occurred in the late 19th century, including germ theory, antiseptis, anesthesia, and diagnostic tests, such as x-rays and the gram stain. Consequently, hospital-based care, especially surgery, became safer and more effective, and infectious diseases became identifiable and preventable. Flexner's reforms ensured 20th-century physicians were able to deploy and enhance these advances. But these reforms are becoming increasingly obsolete, due to 4 inevitable trends (Table 1).

First, chronic diseases represent the dominant medical problem in the United States. Of the 10 leading causes of death in the United States, 7 are chronic illnesses, accounting for nearly two-thirds of deaths and 84% of all health care spending.^{1,2} Medical care of the future must focus less on acute, hospital-based interventions and more on compliance with medications, medical interventions, and lifestyle changes. Future physicians will need more training in psychology and behavioral economics to encourage these patient behaviors.

Second, while 20th-century care was hospital-based, outpatient care now dominates. Hospital admissions peaked in 1981 at 39.2 million (170 admissions per 1,000 people); in 2014, there were just 34.9 million

Table 1. Four Trends in Medical Care and Their Implications for Medical Education

Trend	Implication for Medical Practice	Implication for Medical Education
Greater focus on caring for chronic medical conditions	Emphasis on medication adherence and lifestyle changes	Training in psychology and behavioral economics
Delivery of most medical care outside of the hospital	Emphasis on multidisciplinary teams with physicians as team leaders	Training in psychology, leadership, and team building
Improving the delivery of higher value—higher quality and lower cost—medical care	Emphasis on eliminating waste and unnecessary services, while developing patient-centric approaches to management	Training in operations management and process improvement
Increase in medical information and patient data	Emphasis on retrieval, management, and critical evaluation of information	Less preclinical training in basic sciences

hospital admissions (109 admission per 1,000 people), yet there were nearly 1 billion outpatient visits.³ Medical care of the future will be delivered outside the walls of medical facilities by interdisciplinary teams. Future physicians will need to be leaders trained in effective team management and care coordination.

Third, high-value care will be the norm. In 1960, medical care constituted just 5% of the US GDP; today, it is just under 18%. Pressure to deliver consistently higher-value care will grow. Future physicians will need training in intervention evaluation, operations management, and process improvement to develop and deliver standardized, high-value care.

Medical School	Change
Premed requirements and admission criteria	<ul style="list-style-type: none"> • Eliminate requirement for physics, calculus, and organic chemistry • Eliminate MCAT questions on physics, calculus, and organic chemistry • Require courses in statistics and human psychology
Preclinical training	<ul style="list-style-type: none"> • Reduce training to no more than 15 months • Include initial training in operations management and process improvement • Encourage pursuit of specialty-specific degrees
Clinical training	<ul style="list-style-type: none"> • Capstone course after clinical experience in operations management and process improvement • Include clinician shadowing in outpatient settings

Fourth, “science is growing exponentially . . . and doubles in size every 10 to 15 years.”⁴ The medical care of the future will be awash in information and will require structured information management to help providers offer well-informed care. Future physicians will need more training in the retrieval, management, and critical evaluation of relevant medical information.

While other trends, including standardization of care and real-time performance feedback, are also inevitable, these 4 trends are comprehensive enough to require revamping current medical education. My suggestions are summarized in Table 2. Without such changes, future physicians will be providing care more appropriate to the early 20th century.

Premed Requirements and Medical School Admissions

Medical education begins before matriculation. Prospective medical students are expected to take 13 semesters of prerequisite courses—more

than 40% of all college courses. Many of these prerequisites—especially physics, organic chemistry, and calculus—are irrelevant to being a competent physician. These courses are not even good predictors of student performance; indeed, medical school performance may be better predicted by having a social science and humanities background.⁵

The recent changes to require statistics and recommend psychology courses are a good start. Being able to accurately present the value of treatments to patients requires an understanding of statistics. Similarly, trying to help people change their behaviors and habits and leading interdisciplinary teams involves a great deal of human psychology.

Thus, physics, calculus, and organic chemistry should be eliminated from both medical school admissions requirements and the MCAT. Medical schools should instead require statistics and psychology.

Preclinical Medical Education

Flexner's suggestion of 2 years of preclinical science is still largely operative today. No one doubts the value of anatomy, microbiology, or pathophysiology. But many medical schools, including Harvard, Duke, and the University of Pennsylvania, have safely shortened preclinical training. All preclinical training should be limited to no more than 15 months.

Clinical Medical Education

Despite the predominance of outpatient visits, training remains largely hospital based. Caring for patients with the same underlying condition in different settings requires different knowledge bases and skills. Yet the training of medical students remains predominantly an inpatient activity, as if acute exacerbations requiring hospitalization are the "more important" part of medicine. The hospital focus of clinical clerkships may partially explain why the care of chronically ill patients is so poor.

One way to train students in the outpatient setting is to reinstitute the 19th-century practice of shadowing clinicians. Medical schools should identify talented clinicians, enhance their adult educational techniques, and incentivize them—financially and nonfinancially—to have medical students shadow them. Students would rotate among these different

clinicians, learning how to manage different patient populations. The students would meet each week, either in person or virtually, for more formal didactic sessions.

Beyond Preclinical and Clinical Training

If preclinical training becomes 15 months and clinical training remains 2 years, what should be done with the extra time? One option is simply to reduce the total length of medical education to 3 years. No data show that 4 years of medical school is necessary to produce competent physicians.

Another option is to spend time training physicians in organization management and process improvement to identify waste and redesign processes of care. Such training could be introduced in the preclinical years, and the skills could be re-emphasized during classes following medical students' core clinical experiences.

A third option is to require students to get a second degree. Which degree? Different types of physicians will need different sets of skills. Students focusing on population health might opt for a traditional MPH or MBA. Students attracted to end-of-life care might complete a master's degree in bioethics. Students in primary care might opt for a master's degree in behavioral economics or human psychology. Those medical students who focus on basic science research could still do a traditional MD-PhD program.

Today's medical school students will be practicing through 2050. As medical practice changes, medical education will need to likewise adapt. Medical education of the future needs to eliminate physics, organic chemistry, and calculus as premed requirements, shorten preclinical training to 15 months, and shift more clinical clerkships to the outpatient setting. Medical school should be shortened to 3 years or should include adding additional training valuable to practitioners.

References

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