EDITORIAL

Medical Education 2020—Charting a Path Forward

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While biomedical research continues to advance medical knowledge, improvements in the delivery of health care in the United States have been quite slow. Gallup polls show that the level of confidence, as assessed by the question, "Please tell me how much confidence you, yourself, have in medicine—a great deal, quite a lot, some or very little" has declined from 80% in 1975 to 36% in 2019.[1] Despite time and attention to quality improvement and patient safety efforts, much of the US health care system still contains troubling inequities and ranks poorly among high-income nations for a number of health outcomes.[2-4] This is not surprising; there has not been sufficient progress in improving patient care experiences or improving the health of populations or reducing the per capita cost of care[5] because so little has been done to change the models of delivery or address increasing labor costs or the rising extent of poverty.[6] Improving health care in the United States will require careful consideration of future needs of the population as reflected in the physician workforce and the skills and competencies students and trainees will need to modernize clinical practice.

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Each year, *JAMA* publishes data on the demographic composition, specialty, and geographic distribution of new learners within US medical schools (undergraduate medical education)[7] and graduate medical education (GME)[8] programs. The data included in this issue of the journal provide an opportunity to reflect on current challenges facing leaders in medical education and some possible solutions. However, not much has changed in this education data set year over year, decade over decade. The data validate that the life cycle of medical education is highly structured, repetitive, and predicable. As an archive, the data do not provide sufficient detail to enable bold or disruptive ideas that will move the profession forward.

Although the first-year medical school class size has grown by about 25% over the past decade, given the enormous expense of medical education, it is unlikely more funding will be available to substantially increase the size of the physician workforce much beyond where it is today. How can innovation occur in health care delivery with the currently available resources? Recent trends suggest patient care will continue to shift from inpatient to ambulatory settings and be delivered by members of multidisciplinary teams using cost-effective technologies such as telemedicine and mobile applications. Advances in artificial or augmented intelligence may find an important niche in this space. With increasing recognition that social determinants of health contribute to nearly 80% of health outcomes,[9] a greater focus will be needed on advancing population health and disease prevention. Although basic scientific inquiry is at the core of the medical profession, other research domains will require big data, precision medicine, and the ethical use of technology to improve patient outcomes.

Who is going to develop and recalibrate the medical curriculum to ensure future generations of physicians meet these challenges? Educators will need to prepare students and residents with the knowledge and attitudes to adapt and work effectively in a constantly changing environment and, most important, to have skills to lead interprofessional teams that deliver cost-effective and evidence-based patient care dispersed within local communities; it is unlikely there will ever be enough primary care physicians to do this by themselves. As the longevity of patients with chronic disease increases, students must have opportunities to learn how to "compress morbidity" through better care models outside of hospitals.[10] Critical thinking will be just as important as the ability to memorize facts and, as technology permeates, personal communication and relational skills will become essential. Substantial changes to medical education are required to provide these kinds of training experiences.

Medical education pathways of today are largely process-driven by accreditation, certification, and licensure requirements; the community of medical educators must find ways to evolve process measures toward outcome-driven measures. Despite some small-scale innovation, US medical education remains largely unchanged since the Flexner Report.[11] For nearly all of modern memory, educators using inpatient care models have been constrained by rotation-based approaches and GME payment structures that favor time-based education over outcomes-based ones. Longitudinal clinical experiences that provide authentic continuity of care are critical in developing an understanding of chronic disease management. Meaningful relationships with patients, developed during these experiences, enable students to practice skills in trust-building, shared decision-making, and personalized care plans.[12] A transition to outcome-based teaching could help to encourage sorely needed innovation.

The data contained in this issue of *JAMA* provide a limited glimpse into the current habits of US medical education and permit some speculation about whether it will be possible to effect the educational changes required in the future.[7,8] As a first step, the physician workforce should better represent the populations it serves. Although there have been considerable strides in gender diversity, racial and ethnic diversity continues to be a major challenge. In 2018, 18.2% of resident physicians self-identified as black, Hispanic, or mixed race; this is encouraging but does not yet approach percentages found in the US population.[8] Important lessons regarding more innovation to promote a diverse workforce may be

learned from the specialties with the most diversity, such as obstetrics and gynecology, pediatrics, and plastic surgery.

An additional recurrent concern is the small number of primary care physicians being trained to care for an aging and growing population. Even though some suggest that a robust primary care physician workforce is also needed to effectively train the next generation of students and residents in longitudinal care, chronic disease management, compression of morbidity, and population health, the available data suggest this is not going to happen. In 2018, 18 600 more residents are enrolled in GME compared with 2013, largely due to increasing numbers of graduates from US schools of medicine and osteopathy.[8] Yet, in 2018 family medicine, internal medicine, and pediatrics together account for only 35.8% of the 40 442 annual GME graduates, and many of them sought subspecialty training.[8] Subspecialty training overall shows no sign of slowing down, raising the question of how to redirect current thinking about the training of primary care physicians into something more practicable and achievable given limited numbers. More training experiences in interprofessional care might enable future physicians to lead interdisciplinary teams that include advanced practice clinicians and extend the reach of primary care physicians. This outcome could be achieved with changes to the current approach to training.

Undergraduate medical education and GME training must evolve and do so thoughtfully. Some small early pilots featuring time-variable competency-based training models such as the Education in Pediatrics Across the Continuum[13] program show promise, but additional larger-scale changes are needed in other specialties. More national conversation about what innovations could best serve the future would also help; academic training sites are a great place to encourage experimentation. Undergraduate medical education and GME programs need greater degrees of freedom to enact comprehensive curriculum reform to better prepare graduates to serve a public facing a constantly changing health care environment.

The time has come to reassess the current "one size fits all" approach to medical education and training to allow more studies of individualized tracks based on career paths and new competencies. The medical education community has an obligation to perform high-quality research on the effects of new curricula on learners and the quality of downstream clinical care they will provide. Thoughtfully yet purposefully redesigning key parts of medical education is within reach. Medical education is not likely to drive how health care is delivered until models of care and educational programs become more agile and start addressing the outcomes patients deserve.

ARTICLE INFORMATION

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