


Changing the Clock in Medical Education: Addressing Physician Shortages and Patient Outcomes

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ABSTRACT: Despite the shortage of physicians in the United States, there is no consensus among medical educators as to how to address the nation's unmet needs. A growing but unfulfilled argument is to revisit the configuration of medical education and the time required to complete medical training. Pilot programs, such as shortened programs or advancement-in-place structures to accelerate the practice capability of trainees, have been attempted. This manuscript addresses underlying economic and human considerations that medical educators must reconcile, drawing on lessons from international educational structures, as we advance toward a system that supports the needs of the communities that our graduates will serve.

KEYWORDS: Medical education, time-variable education, competency-based education, pathway programs, equitable education, physician workforce

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Introduction

Physician shortage—by specialty and geographic area—is a growing concern in the United States, exacerbated by the COVID-19 pandemic.^{1,2} While national and international efforts seek to address different contributors to physician shortages, relatively few focus on physician training reform.³ Medical education, steeped in tradition, has failed to systematically innovate to address this problem at scale in the United States. While 7-year programs exist,^{4,5} a degree in medicine typically requires 8 years: approximately 4 years of bachelor's level education and 4 years of medical school (Undergraduate Medical Education, UME). Additionally, medical degree recipients must complete residency training (Graduate Medical Education, GME) to be independently licensed in the United States. This interval of training is not inherently evidence based, as other nations provide alternative degree types (MBBS, MBChB), which vary in length, for medical training.⁶

These educational pursuits necessitate monetary and time costs that persist. That is, the cost of schooling is often financed by loans whose payments (principal plus interest) may extend many years into the future. Similarly, the opportunity cost of one's time in school—time that could be spent in employment—is high. The economic impact of this educational degree in medicine is well-studied; it is characterized by high returns as well as high debt.^{7–9} Both of these economic forces, in addition to preferences (eg, for flexibility, prestige, and altruism) and expectations (eg, about salaries, hours, and stress), influence individual decision making regarding program application, borrowing, specialty selection, and eventual service location.^{9–13}

In some countries outside of the United States, undergraduate medical education commences immediately after high school graduation, in a 6-year curriculum.^{6,14,15} For example, the first 2 years may be dedicated to basic sciences training, the next 2 years are clinical rotations, the fifth year is an unpaid rotatory internship, and the sixth year is dedicated to serving underserved communities. Once this curriculum is completed, physicians are fully licensed to practice medicine with the option of further subspecialty training.^{6,14} The existence of timelines alternative to the US structure of training supports the hypothesis that accelerating training in the United States may be possible; by accelerating the pathway to create practice-ready physicians, we may be able to begin to address the aforementioned workforce concerns. We acknowledge, however, that the potential avenues of exploration described below must be undertaken with other structured solutions such as increasing the number of funded training positions in the United States.

While comprehensive medical care and labor market changes may be needed to fully address physician workforce concerns, we discuss the potential merits of medical education restructuring in the United States, including equitable access, affordability, and human-centered care delivery. To reduce the duration of training while maintaining academic rigor, advocates have proposed 2 routes: accelerated instruction and competency assessment. Some groups propose the creation of accelerated tracks, concentrating training time, and typically requiring a student to commit to an underserved specialty.^{3,16} While such programs have the potential to increase physician



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supply in certain specialties, the approach constrains medical students' career options and limits exploration. Requirement of an early commitment to a specialty without sufficient exposure to other fields induces selection based on expected financial savings and could lead to an inefficient distribution of physicians across fields, skewing recruitment for such programs toward those students with fewer resources. Additionally, concentrated instruction may increase the physical and mental stress on students and instructors.

Others advocate for competency-based assessments in medical education, a system that allows students to advance through the curriculum at an individual pace by meeting standards of achievement. It should be noted, however, that while this competency-based assessments may accelerate the path to independent practice for some, it may extend training for others although hopefully many of these individuals may already experience delays in their training under the current system. While competency-based education may prove feasible at the GME level, it is also logistically challenging at the UME level. For example, national entities, such as the National Residency Match Program, would have to adapt to avoid bottlenecks in undergraduate medical education. To ensure the validity of this model, it would also require the national adoption of comprehensive competency standards across medical schools, which would allow for the advancement of students and trainees in alignment with educational outcomes. The restructuring of medical education in the United States is a daunting undertaking. Smaller scale programs are being explored: FIRST at UNC, the Accreditation Council for Graduate Medical Education (ACGME)/American Board of Medical Specialties Outcome Project, Education in Pediatrics Across the Continuum (EPAC), and accelerated advancement in particular residency programs.¹⁷⁻¹⁹ The potential human and economic advantages (conserved time, professional productivity, supply of providers, etc) of fundamentally restructuring medical education in the ways suggested by these small-scale programs may well outweigh the costs.

These changes may also address other key issues in medical education in the United States. Students from lower-resourced backgrounds and minority populations remain drastically underrepresented in medicine. By shortening training, it becomes more accessible to those facing financial and/or time constraints. Greater representation among the physician workforce promotes racial and ethnic concordance in the physician-patient relationship, minimizing incorrect assumptions,²⁰ reducing inaccurate treatment,²¹ increasing patient participation in decision making,²² lengthening visit durations,²³ and increasing trust.^{24,25} While a positive association between concordance and health outcomes exists,²⁶ identifying causal, positive impacts of concordance is empirically challenging due to individual and systemic aspects of the US healthcare system.²⁷

The economic ramifications of adjusting the length of medical training cannot be overstated. A Netherlands study

reported that accelerated or time-variable training could be costly to healthcare systems, as trainees provide a cheap source of labor.²⁸ Yet, many economic analyses of the proposed solutions fail to consider long-term trajectories of the physician workforce and the accelerating change could actually continue a steady stream of trainees as long as the system maintains commensurate matriculation and graduation rates. Presently, the demand for healthcare exceeds the supply of physicians in many specialties, evidenced by long wait times to secure primary and subspecialty care and even return of patients to their origin clinics where patients are established prior to being able to receive prompt subspecialty evaluation. Much of this excess demand is attributed to an aging population, which cannot be reversed. Hence, remedies more directly addressing the supply of practice ready physicians in the medical care market are warranted. While changes in practice patterns and technological advances/innovations are essential considerations, efforts to increase the supply of physicians are paramount. Indeed, the physician workforce is aging (eg, over a third of California's physicians are over age 60), which is only likely to worsen the shortage in the coming years.¹ Given the present and worsening physician shortage, and as articulated above, structured solutions should be explored which can hopefully provide a more efficient supply of practice-ready clinicians to the workforce.

Conclusion

Given the structure of medical education in the United States, the acceleration of medical training through pathway programs or time-variable education is the proverbial "low hanging fruit." While the specific means of restructuring medical education (reducing training by a year, implementing national pathway initiatives, etc) extends beyond the scope of this manuscript, significant curricular changes would better align the United States with the global schema of medical education and provide distinct human and economic advantages. Simultaneously, researchers must evaluate the impact of byproducts of UME changes (eg, competency-based assessment, patient-physician concordance, reduced burnout, lower debt as well as abridged exposures, and incomplete maturation) now and in the near future with regard to patient outcomes as an ongoing quality improvement initiative.²⁹ These changes would not be simple; they involve complex political and health system reforms. Nevertheless, advocacy for efficient and flexible medical training changes is necessary. Only through one collective voice can we change the clock on medical training and improve our greater healthcare system in the process.

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SMA was involved in conceptualization, investigation, writing—original draft, and writing—review & editing. DG was involved in investigation, writing—original draft, and writing—review & editing. MD-G deF was involved in conceptualization, investigation, supervision, writing—original draft, and writing—review & editing.

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