

enced their choice of specialty. Student debt burdens also adversely affect the economic and racial or ethnic diversity of the medical school population, thereby reducing the diversity of the physician workforce.⁵

Concerns about a 3-year pathway include the sense that though the fourth year is often underutilized, it can be a valuable maturation period for many students, providing opportunities for research or additional clinical exposure. Related concerns include the potential loss of exploration and enjoyment in the medical education process. Certainly, careful mentoring and monitoring, beginning at the time of matriculation, as well as the opportunity to opt in or opt out, are essential for the success of any accelerated training program.

Shortening UME training for selected students should be viewed as just one approach to addressing the need for change in the post-Flexnerian era. Shortening brings its own challenges, particularly the need to assess competency in the fast-tracked UME model. Indeed, if medicine shifts away from traditional time-based evaluation, such evaluation must be replaced by competency-based

assessment — ideally, a standardized national assessment model. In the years ahead, developing a uniform set of milestones and competencies whereby assessment cuts across each level of medical school, residency, and fellowship, thus linking UME and GME as a continuum of learning, will be a major task for medical educators.

The need for medical education reform in the post-Flexnerian era is widely recognized. We need to address the ways in which physicians acquire and manage information, utilize technology, and serve the country's needs, while delivering culturally competent care that reduces health disparities. The past three decades have seen a gradual lengthening of the training process, driven by isolated decision making at the individual programmatic level. We are at a point of inflection where a coordinated approach spanning the silos of UME, GME, accrediting organizations, and health care delivery systems is critical. We need to train physicians who are committed to lifelong learning and who are passionate and highly trained care providers, as well as scientists and leaders of a new health care delivery model. Time

spent in training is an important factor in medical instruction, and the process of becoming a physician requires an extended period (premed, UME, and GME) of both learning and practical experiences. We must ensure the value and efficiency of our educational efforts, appreciating the various ways in which trainees at all levels will be able to master the requisites necessary for entering the medical profession and advancing within it.

Disclosure forms provided by the authors are available with the full text of this article at NEJM.org.

An audio interview with Dr. Richard Schwartzstein about 3-year M.D. programs can be heard at NEJM.org.

From NYU Langone Medical Center, New York.

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BECOMING A PHYSICIAN

The 3-Year Medical School — Change or Shortchange?

Stanley Goldfarb, M.D., and Gail Morrison, M.D.

Shortening medical school to 3 years, some observers argue, would increase the supply of physicians — perhaps particularly primary care physicians — and reduce the cost of medical training, without compromising clinical care.¹ Data from many years of experiments in shortening

medical education, however, suggest that doing so is unwise — a conclusion supported by assessments of the readiness of today's medical school graduates to assume increased clinical responsibility as they enter residency programs.² There may be exceptional students capable of accelerated

learning and small programs that create unusual opportunities for such students, but we believe that for the typical student seeking an M.D. degree, the duration of medical school should not be shortened.

There are many examples of past attempts to shorten training

by combining baccalaureate and medical education (B.A.–M.D.) into a 6- or 7-year experience. Western Reserve University made the first attempt in the 1950s. By 2011, some fraction of the entering medical school class at 67 U.S. schools were students pursuing combined B.A.–M.D. degrees; 39% of community-based medical schools and 33% of research-intensive schools had such programs. But among schools offering a B.A.–M.D. program, the proportion that compressed their curriculum into 6 years dropped from 23% in 1990 to 7% in 2011, and the proportion requiring 7 years fell from 32% to 13%. Thus, only 20% of the medical schools that once hoped to abbreviate the duration of B.A.–M.D. education now offer programs shorter than 8 years.³ Moreover, even in these programs, most of the time savings result from reducing the B.A. portion of the curriculum while maintaining a 4-year medical school curriculum. Indeed, the number of schools reducing the duration of the medical school component has declined dramatically. In 1974, a total of 33 schools allowed students to obtain an M.D. degree after 3 years in their curriculum's medical school component,⁴ but such options virtually disappeared from the scene thereafter, only to reappear in 2013 in two nascent programs aiming to produce primary care physicians.

The reasons articulated in 1970 for embarking on a 3-year curriculum were the same as those cited today: to reduce the cost of education and to increase the number of primary care physicians in a country facing an anticipated physician shortage.⁵ The causes of the failure of those 3-year programs are not well documented, but some common

points have emerged. Both students and faculty felt pressured by the compression of material. As many as 25% of students negated the supposed benefits of an accelerated program by voluntarily extending their education by 1 or 2 years. Even as these students were often stigmatized as weak or deficient for failing to complete the program in 3 years, students who were able to complete the program in that time felt "exhausted," having studied in an uninterrupted slog through 34 of the program's 36 months.⁵ Perhaps most important, there was substantial faculty dissatisfaction with the adequacy of the curriculum. The expansion of medical knowledge since that time, combined with a recent trend toward reducing the pre-clinical curriculum to 1.5 years, puts even more pressure on the faculty to provide a comprehensive education and on students to gain required knowledge.

Other aspects of the failed experiment of 40 years ago resonate in the current proposals. The hope that students would opt for primary care careers was not consistently borne out. Students enrolling in some accelerated B.A.–M.D. programs in community-based medical schools tended to enter careers in family medicine in higher numbers than did those from standard M.D. programs, but even those numbers were nowhere near the hoped-for 60 to 75%; and overall, these programs did not consistently boost the number of students choosing primary care careers.

At one time, the fourth year of medical school was spent exclusively in outpatient care settings, but its emphasis has largely shifted to inpatient electives,⁵ through which students seek broad experience in fields in which they

may soon choose a career. Most students spend several months pursuing electives at institutions that rank high among their residency-site choices. They also spend 2 to 3 months interviewing at the hospitals where they would consider pursuing post-graduate training. If the fourth year were eliminated, these activities would need to occur during the third year, further compromising clinical education, or would have to be abandoned. Though some observers argue that these efforts to sort through career options and residency programs lack educational value, they are necessary steps for students who are asked to fund their medical education and are therefore entitled to shape the location and nature of their post-graduate training.

In addition, access to global health experiences; instruction in medical ethics, principles of patient safety, and health policy; and advanced clinical experiences are extremely valuable components of the current fourth year. Moreover, there is a recent trend toward students' seeking even longer terms for medical school, with the opportunity to gain additional credentials, including master's degrees, certificates of added competence, and prolonged research-training experiences. All these activities speak to students' sense of an expanding leadership role for physicians on future health care teams.

In our view, the third year of medical school curricula requires reform, since students currently have inadequate opportunity for the direct patient contact that they need to become independent caregivers. Work-hour regulations apply to students as well as residents, and the current heightened focus on efficiency and

safety can impede students' ability to gain required procedural skills and to develop close relationships with patients. We strongly believe that educators should ensure that each clinical rotation is actually a course in a given discipline rather than simply a 1- or 2-month period of clinical involvement or observation of clinical care. Extensive didactics and the use of new tools for evaluating students' competence in each discipline should be required components of each clinical clerkship. The fourth year, then, should be a time to hone these new clinical skills and narrow down career choices.

Unfortunately, the current fourth year fails to prepare many students for more advanced responsibilities. In a 2009 survey, about one third of residency-program directors representing 10 medical specialties and 21 institutions indicated that interns struggled with the organization of medical knowledge and the application of that knowledge to patient care, professionalism related to assuming responsibility, their fund of medical knowledge, and the ability to work without supervision, among other issues. The researchers concluded that fourth-year students need to "ex-

pand their knowledge in both clinical and non-clinical domains."² Truncating the medical school experience would make it far more difficult to accomplish that goal.

To better prepare students for residency, we believe that more intensive clinical experiences in both outpatient and inpatient settings are needed and that innovative advising and mentoring programs should be created to enhance the transition to residency. Given the growing complexity of medicine, it seems counterproductive to compress the curriculum into 3 years, reducing both preclinical and clinical experiences. The limited opportunity for students to participate meaningfully in patient care during their undergraduate careers is the problem that needs correction; the solution is not to rush students into residency after allowing them even less involvement with patients.

The physician's role on the health care team is evolving. Teams of physicians, nurse practitioners, physician assistants, and pharmacists can develop new paradigms for delivering higher-quality clinical care, even with a predicted shortage of primary care physicians. Physicians may

need even more advanced education — in health policy, public health needs, clinical research, and medical ethics — in order to lead such teams. But we believe that, at the very least, physicians will succeed as team leaders only if they first attain all the clinical competencies required by the Accreditation Council for Graduate Medical Education. That requires enhancement, not shortening, of medical school.

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HISTORY OF MEDICINE

Autism at 70 — Redrawing the Boundaries

Jeffrey P. Baker, M.D., Ph.D.

This year's revision of the diagnostic criteria for autism is among the most contentious of any in the new *Diagnostic and Statistical Manual of Mental Disorders* (the fifth edition, or DSM-5), provoking widespread fears among parents and advocacy groups that children who have received a diagnosis of

autism will lose their eligibility for services. Coincidentally, this year also marks the 70th anniversary of psychiatrist Leo Kanner's first clinical description of autism in 1943.¹ Though the DSM-5 definition explicitly refers to autism as a spectrum, in important ways it represents an ef-

fort to define the syndrome more sharply. In this respect, it reflects one of the central themes in the history of autism: a debate over where to set its boundaries.

Kanner did not so much define as portray autism, in the course of a series of memorable case histories drawn from the