

Editorial

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American medical education: the evolution of excellence

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Despite a formal medical education system that only dates back to the mid-1700s with the founding of the first medical school in the United States (University of Pennsylvania: 1765), the USA is respected for its pursuit of excellence [1]. Excellence in medical education is due to the American cultural system that values the concept of a meritocracy that demands continued evaluation and improvement.

Excellence in clinical care, education, and research is the essence of American medicine. Meritocracy is a fundamental American value that facilitates this goal. Since the time of our nation's independence in the 18th century, the value of advancement based on success is celebrated in American life and academic institutions. The notion that job security as well as promotion is often based on concrete deliverables (financial stability, academic publications, grant funding) helps drive the academic medical system toward excellence.

A special aspect of the American academic medical center is that of the faculty practice in which physicians perform “private practice” under the auspices of the medical school. The main responsibility of these physicians is clinical care and they may not be directly linked to the research missions of the university [2]. Income generated from patient care supports physicians' salaries as well as the cost of running the practice. The “taxes” generated by the practice are used to subsidize other missions of the department such as teaching, research, and care for the uninsured. The department pays for rent, professional liability, and support staff, freeing the clinician to focus on patient care and not practice management.

One way American physicians can distinguish themselves is through additional training. As the benefits of working with colleagues with other skill sets has become clear, medical schools are now expanding training to allow for completion of dual degree programs including the MD/PhD, MD/MPH, MD/JD, and MD/MBA [3].

Another path to career advancement is through both institutional and geographic mobility. It is accepted and encouraged for physicians to move. Often a move will occur because of an opportunity at another institution. Leadership positions as division directors and department chairs are rarely given to the “next in line” at an institution. Instead, national searches are conducted to ensure getting the “best candidate”. In addition to career advancement for an individual, this mobility encourages the spread of new ideas and technology. Students, residents, and faculty who may have become complacent with doing things the institutional way are now challenged with new ideas and technologies. This is in contrast to some other countries where the expectation is to stay at a single institution and where promotion through apprenticeship is often the best path to advancement. Furthermore, US medical students are encouraged to perform elective months outside their institution. Many students perform international electives. Students also participate in electives at other hospitals often with the goal of securing a residency position. These opportunities expose students to the way medicine is practiced in different geographic regions and with different patient populations.

The American medical system encourages physicians to achieve independence. Medical training is formalized into highly structured medical school, internship, residency, and fellowship. These educational opportunities are time limited unlike other countries where this is sometimes not the case. After completion of training, there is no expectation of continued apprenticeship, a commonplace occurrence in some other countries. The goals of American training programs are to produce fully functioning independent physicians. Junior attending physicians may seek out mentorship for discussion and

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assistance with difficult cases after their formal training, but the expectation is that one graduates from a residency or fellowship capable of performing the relevant aspects of the profession. Oral board examinations in obstetrics and gynecology, typically taken 2 years after completion of training, are designed to assess the physicians' ability and experience to perform all skills expected from a board-certified physician. The expectation is that by 2 years after completion of training one is able to demonstrate both the breadth and depth of experience to be deemed an independent board-certified practitioner.

Experiential education is an intrinsic part of the American medical educational system. This has been exemplified by the "See One, Do One, Teach One" philosophy. While concerns for patient safety and supervision have brought this methodology under fire [4], there continues to be great importance placed on learning by doing. To that end, simulation of both personal encounters as well as technical skills are becoming a routine part of American medical education [5, 6]. The new ACGME residency program evaluation system is embracing a "milestones" approach for advancement in which the timing of advancement is directly related to mastery of both skills and knowledge. The importance of skills in addition to knowledge is demonstrated by the licensing process: American physicians must now take not only a written examination, but also a clinical skills examination in order to be licensed to practice medicine.

Collaboration with innovators outside academic medical centers is a way that the academic medical center has been able to fund research and spark new ideas in a time of decreased government research funding. Although there continues to be concerns about pharmaceutical industry support of continuing medical education [7], drug development may result in patient benefit and financial remuneration, so the interests of the academy and industry are aligned. Numerous medical centers have recently partnered with drug companies to increase funding and facilitate drug development. Furthermore, larger collaborations to bring together industry, technology, and academic medical centers are valued. An example of this is the Cornell Tech Campus in New York City. The government of New York City provided both a land grant and money for infrastructure to develop a campus in New York that would bring together clinicians, research scientists, computer scientists, engineers, and financiers. Such a program is believed to benefit the city through job creation. Access to all the personnel and infrastructure to bring an individual researcher's idea to a marketable product may be a model of the academic medical center of the future.

The dollar is a great motivator for continued improvement in medical education. Medical schools in the USA are expensive, and the cost is born in part by the individual; for the 86% of medical students with educational debt in 2011, the average debt is over \$160,000 [8]. Individuals who lack financial resources may not have the opportunity to become physicians, and graduates sometimes choose their specialty based on financial considerations. However, those who attend medical school expect "the most bang for the buck". Schools are competing for the best students and their tuition money. Schools are motivated to provide students with the best medical education. This has translated into novel educational reforms including small classes, extensive mentorship opportunities, and an emphasis on team-based and problem-based learning [9]. The field of medicine is changing rapidly, and it has become accepted that medical education must also change to give students the skills they need to practice in the modern world. While some aspects of medical education have remained unchanged, the funds in academic medical centers are being spent, in part, on advancing medical education with simulation centers and extensive technologic resources to enhance learning and student satisfaction.

The interest of the medical students has also driven the development of new academic programs. In recent years, there has been an increasing interest in the field of global health among medical students. Increasing numbers of students are pursuing elective opportunities outside the USA. This has the benefit of exposing students to different health systems as well as teaching cross-cultural sensitivity [10]. Numerous medical schools partner with hospitals in other countries to allow students and faculty the opportunity to do research and obtain training. Furthermore, in response to student interest, medical schools are developing comprehensive global health curricula. In addition to increasing student satisfaction, such programs are associated with a future career working in primary care or with underserved populations [10].

Perhaps the greatest attribute in American medical education is the willingness to change with the hope of improvement as well as to challenge both long-held assumptions and authority. These fundamental values date back over a century. In the early 1900s the American Medical Association created the council on medical education that requested a survey of American medical education. The resulting "Flexner Report" [11] led to distinct recommendations to improve medical education. As a result, education was standardized, numerous medical schools were closed, admission standards

were strengthened, and the academic medical center was established [12]. The resultant improvement in the quality of physicians and patient care has encouraged the continuation of self-study as well as provided a model for challenging the *status quo* to improve patient care. A current example of this is seen with resident work hour limitations. Changes were made in American resident work hour regulations in 2003. Although the changes were required and adopted, they were not blindly accepted. There have been a plethora of papers published since the adoption of these rules on the effects on patient safety, resident competency, and overall quality of life [13, 14]. If the data do not ultimately show a benefit to patients and residents, the rules will change. This is one example of how the medical training system in the USA is presently evolving. Medical schools, residencies, and fellowships are evaluated frequently, and the methods of evaluation change as new data become available. Although there is a tremendous paperwork burden associated with these evaluations, the requirement of constant self-evaluation and external evaluation keeps training programs striving for excellence.

These standards do not only apply to trainees such as medical students and residents. With the rapid changes in medicine, as well as scrutiny from the general public, there has been a new emphasis placed on lifelong learning for board-certified physicians. While board certification used to be granted for life, in 1986 it switched to a time-limited designation. Currently, in OB/GYN, practitioners are only certified for 1 year and must be continually enrolled in a maintenance of certification process. They have annual reviews of professional standing and lifelong learning and practice performance assessment [15]. Efforts are being made to ensure that the process improves competency without being too burdensome. Although the process is currently in place, the plan is for it to be “constantly reviewed, evaluated, and modified to meet the needs of our diplomates and fellows [16]”

The American medical education system is designed to balance oversight of quality with individual education and career goals. Pathways exist for clinicians to succeed through patient care, research, technology development, medical economics, and health care systems development. Allowing for broad definitions of success and constantly striving for improvement are hallmarks of excellence in American medical education.

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