



Do Applicants to MD, DO, and International Schools Overlap?

There are three pathways available to US students who wish to study medicine: allopathic medical schools that award the MD degree, osteopathic medical colleges accredited to award the DO degree, and international medical schools that bestow an MD or equivalent degree. Graduates of all three types of programs, after passing the appropriate licensing examinations, may be licensed to practice medicine in the United States. Students who are unsure of their prospects may apply to more than one type of school, or may apply to different types of schools in different years. Paul Jolly, PhD, and associates investigated the total pool of applicants to all three types of schools to assess the degree of overlap in the three applicant pools, and to look at applicant characteristics that were shared and not shared by the different groups.

A cooperative agreement among the AAMC, the American Association of Colleges of Osteopathic Medicine, and the Educational Commission for Foreign Medical Graduates allowed the investigators to identify applicants and students of all three types and to combine their data into a study file containing data on applicants for each year.

An obvious result of the analysis is that the total numbers of applicants were much lower than the sum of the counts for the three types of schools, implying that the applicant pools overlap substantially. Looking at the various combinations of applicants, the investigators found that, in 2004 (the last year for

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which there was a complete data set), about 14.5% of applicants to a US MD school also applied to a DO school in the same year; 2.2% applied simultaneously and successfully to international schools, and fewer than 1% applied to all three types. More than two-thirds of applicants to DO schools also applied to MD schools, and 3% also applied to international schools. Slightly more than 2% of applicants to DO schools applied to all three types of schools in the same year. Meanwhile, 71.8% of international students did not apply to either US MD or DO schools in the same year.

The authors conclude that if all first-time applicants applied to US MD schools, the pool of first-time applicants would be increased by only 11%. Although the number and quality of applicants seems to be adequate for the near term, it is important to continue to monitor these trends.

Jolly P, Garrison G, Boulet JR, Levitan T, Cooper RA. Three pathways to a physician career: applicants to U.S. MD and DO schools and U.S. citizen applicants to international medical schools. Acad Med 2008;83(12):1125-1131.

Laws of Physics and Economics Apply to Medical Education

The knowledge needed to practice medicine has empirical and scientific roots, but must be applied logically and judiciously to the particular patient in a particular context. In addition, physicians practice in a world with physical limitation and increasing economic demands. David R. Haburchak, MD, and co-workers assert that in the shifting paradigm from "medicine" to "health care," a quixotic neglect of important laws of physics and economics has challenged the precepts of medicine, generated unrealistic expectations among practitioners and public, and has imperiled medicine, society, and individuals.

The authors propose eight laws that should be applied to all aspects of health care and its delivery. Physical laws include:

- ❖ Finitude;
- ❖ Inertia;
- ❖ Entropy; and
- ❖ The uncertainty principle.

Economic laws include:

- ❖ Diminishing returns;
- ❖ Unintended consequences;
- ❖ Distribution; and
- ❖ Economizing.

The physical laws acknowledge the finitude, resistance to improvement, constant deterioration, and uncertainty inherent in all creation; the economic laws demonstrate the frustrated perfectionism, perverse outcomes, variable potency, and opaque motivation of human behavior. Whereas the commonly espoused rules of medicine represent idealistic goals, say the authors, these eight principles describe observable reality. When academic medicine emphasizes idealism, professionalism, and perfectionism, it does its students a disservice by denying the realities of medical practice today.

Therefore, the authors maintain, medical students should be proficient in the humanities as well as the sciences, to better understand the psychological, sociological, and economic aspects of illness. They recommend courses in psychology, management, ethics, logic, industrial education, marketing, and statistics, among others, noting that courses such as these stress a holistic perspective, critical analysis, and practical approaches to real-world problems that affect humankind.

Haburchak DR, Mitchell BC, Boomer CJ. Quixotic medicine: physical and economic laws perilously disregarded in health care and medical education. Acad Med 2008;83(12):1140-1145.

Spiritual and Religious Identities of Academic Pediatricians

Physicians have become aware that their patients' spiritual and religious beliefs and practices may affect their health outcomes. However, the physicians' own beliefs may also influence their medical practices. Elizabeth Ann Catlin, MD, and colleagues gathered information from academic

pediatricians in 13 US academic medical centers to investigate respondents' personal religion and spirituality and their affect on their practice of medicine.

From the population of all faculty-level pediatricians in the sample hospitals, 116 responded. The survey asked 34 closed-ended questions about respondents' spiritual and religious beliefs, identities, practices, and ethics, and about the intersection of religion and science in the respondents' fields. Answers were also compared with those of a sample of the general American public.

Of the 87% of respondents who said they were raised in a religious tradition, 41.4% identified themselves as Protestant, 25.0% Catholic, 15.5% Jewish, and 6.0% "other." Only 7.8% said they were raised without a religious tradition. However, when asked about current religion practice, 27.6% reported it as "none." The religious identities of academic pediatricians were significantly different from those of the American public, notably in that only 14.0% of the general public reported no religious preference, 53.8% of the public identified as Protestant, and 1.8% of the public identified as Jewish. More than half of respondents reported belief in God, although the proportion was lower than that of the American public. There was very little difference between the physicians' responses and those of the public, however, when they were asked to describe their levels of spirituality. Although only 40.6% of physicians said they attended religious services regularly, more than half reported privately praying or engaging in other religious or spiritual practices.

When asked whether their spiritual or religious beliefs affected their interactions with patients and/or colleagues, 58.6% of pediatricians felt that they did to some extent. The likelihood of pediatricians thinking that their beliefs influenced their interactions was five times higher for those who attended religious services regularly.

The authors state that the beliefs of this sample are relevant because these are the opinion leaders, teachers of the next

generation of pediatricians, and authors of research and textbooks. The authors call for further research to support or refute the findings of this survey.

Catlin EA, Cadge W, Howard Ecklund E, Gage EA, Zollfrank AA. **The spiritual and religious identities, beliefs, and practices of academic pediatricians in the United States.** *Acad Med* 2008;83(12):1146–1152.

Should Medical History Be Part of the Curriculum?

Several studies have commented on the value to clinicians and medical students of studying and understanding the history of medicine, as it can give students a sense of perspective and continuity by broadening their intellectual horizons; improving their judgment, reasoning, and social comprehension; and providing role models (both positive and negative) in historical figures, events, and practices. Studying medical history, says Daniel K. Sokol, PhD, MSc, MA, in a "Perspective" article, helps students to develop their intellectual curiosity and instills a spirit of inquiry that should help them in their future roles as clinicians and researchers, and it is also conducive to greater emotional maturity.

For these reasons, the author feels that at least a modicum of medical history should form part of the mandatory curriculum in medical schools. Realizing that there is little room to increase the amount of coursework, he proposes reducing the number of sessions on medical ethics, as medical history can also contain a strong ethical component. Medical history can serve a similar function to medical ethics, encouraging students and clinicians to develop appropriate sensitivities toward themselves, their profession, and their patients. Medical history and medical ethics can complement each other; the challenge is finding suitably qualified faculty to teach both these subjects.

Sokol DK. **Perspective: Should we amputate medical history?** *Acad Med* 2008;83(12):1162–1164.

Reliability of Concept Mapping Assessment in Medical Education

Concept mapping can provide a representation of a learner's knowledge structure, as learners demonstrate how concepts are related to each other by creating maps that link related concepts using directed lines labeled with phrases that describe their relationship. Concept maps can provide educators with a window into the way learners organize and understand relationships among concepts. The reliability of concept map testing in a medical education context is unknown; therefore, Malathi Srinivasan, MD, and associates sought to develop a reliable scoring method and test its reliability.

The researchers studied a group of second- and third-year residents and fourth-year medical students who completed a one-hour standardized concept map training session. Immediately after training, and again several weeks later, learners were asked to create concept maps about two medical conditions: diabetes mellitus and asthma. The maps were scored using three different scoring systems along with a hybrid scoring system that combined features of the first three.

The investigators graded the concept maps with three systems—structural, quality, and importance/quality (I/Q)—as well as a hybrid involving the I/Q score. They found that three systems—quality, I/Q, and the hybrid system—could be administered reliably in medical education. However, there was substantial variability in learners' scores depending on the occasion on which they were tested. Thus, to achieve an adequate level of reliability it would be necessary for learners to be assessed on four or five occasions. The I/Q scoring system reported by the authors provides the ability to discriminate the relative importance of propositions to the depth of understanding of the subject domain, and the authors prefer this method over the others because of its greater face validity.

Srinivasan M, McElvany M, Shay JM, Shavelson RJ, West DC. **Measuring knowledge structure: reliability of concept mapping assessment in medical education.** *Acad Med* 2008;83(12):1196–1203.