Returning to the Body: Potential Reforms in Medical Education

Shreyas Rajesh
Harvard Medical School
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During the COVID-19 pandemic, physicians faced a doubled challenge. Inundated by more patients than hospitals had been constructed to accommodate, providers were also tasked with providing robust care in the absence of scientifically-tested therapies. How did excellent doctors prevail? Knowing the guidelines for the treatment of respiratory diseases could only get one so far; facing an austere absence of scientific insight, it was a thorough understanding of first principles that enabled physicians to provide the best possible care for patients under uncertain circumstances.

As globalization, climate change, chemical exposure, and increased zoonotic contact increase the frequencies at which new diseases impact populations, providers can expect to frequently encounter illnesses that challenge their knowledge bases (1). Just as new diseases will strike terror in us, so too will new therapies dazzle us. Who knows what surgeries will have been invented, what preventive screening measures adopted, or what miraculous drugs will be easily available in this new future? The world in 2050 will look radically different from our own, and to best prepare for it, physicians must know much more than the diseases of today.

Going forward, we can expect one reliable constant: the human body. Timescales of innovation may be rapidly compressing, but timescales of physiological evolution likely will not be. Instead of focusing medical education on each new treatment introduced, to best prepare future physicians, we must center the future of medical education on a deep understanding of the human body.

This pedagogy must be differentiated from a disease-focused one. In the traditional disease-centered approach, students learn to identify constellations of symptoms and then arrive at a diagnosis and understanding of the pathology. This practice is the entire basis of licensing exams and for an appreciable reason: pattern recognition and diagnosis is the "bread and butter" of medicine. Yet in a world of escalating technologies and rapidly developing diseases, this

approach is not good enough.

I instead argue for an organ systems-focused approach, in which normal physiology is taught and then disease is explained in the context of the baseline state. This is not a revolutionary proposition. Many medical schools today already deploy an organ systems-first approach to education (2). These approaches definitionally focus on the body as the unit of medicine, emphasizing, organ-by-organ, normal physiology and its pitfalls in disease.

To enact this kind of curricular reform, we must reimagine the medical school classroom itself.

No one learns to problem solve by attending a lecture. During the undergraduate medical education years, students must be tasked with thinking critically about abnormal and normal systems. This means that class time should focus on problem-solving, and assessment should provide students an opportunity to demonstrate mastery of a system by elucidating its component parts in-depth. The way to build deep thinking is to create educational opportunities that invite student engagement; case-based, small-group learning modules are imperative.

These are two tangible interventions that we might adopt now to bring us to the future of medicine as it should be in 2050. The emphasis on critical thinking is, fortunately, already being embraced. The University of Vermont at Larner College of Medicine (UVM) eliminated almost all its didactic sessions in 2019, in a model that prioritizes cased-based learning and problem solving, both in teams and in small-group learning. In 2006, Case Western University launched its Case Inquiry Teams (Case IQ), involving groups of eight to ten students who work in-close contact with the professor (4). This structure is also the bedrock of the Harvard Medical School Pathways curriculum. Harvard's distinctive case-based collaborative learning format emphasizes deep learning through active problem solving and engagement, and courses emphasize physiology (5). While UVM, Case Western Reserve, and Harvard are distinct in their approach, numerous other schools—including Dell Medical School, Washington University in St. Louis, University of Michigan, and Yale University—have embraced this pedagogy (6-9). The replication of this model has shown that it is at least partially feasible at a wide range of institutions.

The second intervention is the reversal of a trend. Cadaver labs seem to be on the way out; I propose that in the future, they should return (10). **There is no way to understand anatomy without immersion.** Actual time spent with the donor enables one to develop an appreciation for the intricacies of how organ systems relate to each other. While conceivably, some futuristic simulations might provide a similar experience, the cadaver also is the medical student's first teacher—the first body in their hands, and for many, the first time they might have come so close to death.

Naturally, the question arises: if the focus is pure physiology, with disease treatment coming secondarily, will future physicians be ill-equipped to leverage novel treatments when the time comes? The medical classroom I envision here does not eschew the capacity to diagnose, nor does it inadequately prepare students to understand drug mechanisms. But consider a software program that, upon the typing of a word such as "IBD" immediately offers the name of multiple drugs with corresponding clinical trials. This vision is not bold, as it is where electronic medical records are headed within the next five years. The artificial intelligence revolution will likely enable providers to more quickly and more accurately access insights from the latest research. **Diagnostic excellence, physician's intuition, and an innate knowledge of physiology will be paramount, and knowing treatments will be less important than knowing how to critically navigate new information.**

So, how do we get here? One can hardly envy a medical dean, who must negotiate the inverse

pressures to at once prepare students to think critically and understand deep physiology while simultaneously ensuring that board scores do not suffer. To truly revolutionize medical education, we need to adopt an ambitious—and frankly, expensive—type of NBME exam. Future board exams should present future doctors with questions that interrogate underlying physiological mechanisms and cases, not just one-answer questions with finite options. Students should be interrogated to see how much they understand the physiology, not just on whether they can regurgitate information.

2050 will give physicians many new resources to improve the care and wellbeing of patients, and it will demand a new set of skills. To succeed, we must reinforce the idea of medicine as a study of the human body, asking our students to think deeply and critically about human physiology from first principles. There are no doubt challenges to revolutionizing a system of medical education and assessment, but we already have schools that have successfully embraced the idea of a problem-based approach to education. Let us hope to stay on this course to best care for the patients of the future.

References

1. Hunter PR. Future disease burden due to the rise of emerging infectious disease secondary to climate change may be being under-estimated. Virulence. 2025 Dec 31;16(1):2501243.

2. Xia L, Jiang B, Zhang J, Yang K, Zhang Q, Zhu PY. Organ-System-Based Curriculum in Medical Education: A Scoping Review. Adv Med Educ Pract. 2025 Sept;16:1675–81.

3. Noonan K. Vermont Medical School Ceases All Lectures from Curriculum and Adopts "Active Learning" Techniques for Teaching Next Generation of Physicians [Internet]. Dark Daily. 2017 [cited 2025 Dec 20]. Available from: https://www.darkdaily.com/2017/12/01/vermont-medical-school-ceases-all-lectures-from-curriculum-and-adopts-active-learning-techniques-for-teaching-next-generation-of-physicians-1130/

4. Case Inquiry Program | Curriculum | Case Western Reserve University [Internet]. Curriculum | Case Western Reserve University. 2025 [cited 2025 Dec 20]. Available from: https://case.edu/medicine/curriculum/curriculum-overview/foundations-medicine-health/case-inquiry-program

5. Schwartzstein RM, Dienstag JL, King RW, Chang BS, Flanagan JG, Besche HC, et al. The Harvard Medical School Pathways Curriculum: Reimagining Developmentally Appropriate Medical Education for Contemporary Learners. Acad Med. 2020 Nov;95(11):1687–95.

6. Leading EDGE Curriculum [Internet]. Dell Medical School. Available from: https://dellmed.utexas.edu/education/academics/undergraduate-medical-education/leading-edge-curriculum

7. MD Program Curriculum Overview & Highlights [Internet]. Umich.edu. 2025 [cited 2025 Dec 20]. Available from: https://medschool.umich.edu/programs-admissions/md-program/md-curriculum/md-program-curriculum-overview-highlights

8. The Yale System [Internet]. medicine.yale.edu.https://medicine.yale.edu/md-program/admissions/yale-system/

9. Curriculum | MD Program | Washington University in St. Louis [Internet]. Wustl.edu. 2025. Available from: https://md.wustl.edu/curriculum/

10. Nadir Al-Saidi. Medical schools are eliminating the use of cadavers, and that's a shame. STAT. 2025.

Correspondence: shreyas_rajesh@hms.harvard.edu

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