Why systems thinking is make or break for medical students’ careers

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The last few years have been a whirlwind for medical education. The COVID-19 pandemic, growing awareness of social determinants of health, shifting economics and rapidly changing technology have all posed new challenges for educators charged with preparing physicians to-be. But there’s a concept—systems thinking—that ties together all these phenomena and even facilitates the master adaptive learning process.

Following are highlights from "How Can the Master Adaptive Learner Model and Health Systems Science Collaborate to Improve Health Care?" That is Chapter 15 of The Master Adaptive Learner, an instructor-directed textbook designed to help faculty engender the habits of mind for lifelong learning in medicine in their students. The Master Adaptive Learner is the first book in the AMA MedEd Innovation Series, which provides practical guidance for local implementation of the education innovations tested and refined by the AMA Accelerating Change in Medical Education Consortium.

Seeing beyond the exam room

Systems thinking is what unifies all the domains in health systems science, the emerging third pillar of medical education that complements the basic sciences and clinical sciences by describing how care is delivered, how health professionals work together to deliver that care and how the health system can improve patient care and health care delivery. Systems thinking involves specific habits of thinking that enhance one’s approach to assessing a challenge and generating integrative solutions.

Traditionally, physicians have been trained to see relationships between the parts of the system with which they are directly involved but not necessarily to see the less-apparent, systemic forces, says the book chapter. It was co-written by Jed D. Gonzalo, MD, MSc, associate dean for health systems education at Penn State College of Medicine; Stephanie R. Starr, MD, associate professor of pediatrics at Mayo Clinic Alix School of Medicine; and Michael Dekhtyar, former research associate at...
"For example, they may not consider their patients' experiences outside of the examination room, such as those that limit access to care (e.g., lack of transportation for underserved patients) or unnecessarily increase the cost of their care (e.g., the influence of fee-for-service models in physician overuse of some tests)," the authors wrote.

Physicians must also perceive systems forces beyond their own organizations, "such as understanding the impact of medication costs on their patients resulting from nontransparent drug cost negotiations between insurance companies and pharmaceutical corporations," the authors added.

**Propelling master adaptive learning**

As the keystone in health systems science, systems thinking also is essential to phase one of the master adaptive learning process, planning, which "requires learners to identify gaps between what is and what should be," the authors wrote.

In a traditional curriculum—one without an emphasis on health systems science—students might only label gaps according to the basic and clinical sciences.

But master adaptive learning requires them to deliberately reflect on systems factors "because knowledge application without reflection in novel, complex or ambiguous contexts, or a combination of these, is insufficient for effective clinical decision-making," the authors wrote.

Meanwhile, other health systems science domains can be applied to the three remaining phases of master adaptive learning, such as social determinants to phase two, learning; high-value care to phase three, assessing; and health systems improvement to phase four, adjusting.

**Expanding identities too**

This melding of health systems science with the master adaptive learner process even plays a role, known as systems citizenship, in early professional identity formation.

"Despite the potential benefits of this new professionalism to improve patient care, students do not necessarily see their role as systems citizens or innovators," the authors wrote. Incorporating the master adaptive learner process within health systems science education thus presents an opportunity "to highlight learners' responsibility and opportunity to improve their own learning and the health care system."
The AMA has released the second edition of the *Health Systems Science* textbook, published by Elsevier, which is a framework for this third pillar of medical education. A companion, *Health Systems Science Review*, provides case-based questions followed by discussions of answers and suggested readings.