In Reply to Nagirimadugu and Tippireddy: We are pleased to read the comments from Nagirimadugu and Tippireddy because the perspective of medical students is imperative to successful integration of machine learning (ML) content into medical curricula. We agree that a multimodal approach to teaching ML is integral to effective incorporation of ML content into curricula. In addition to lectures and small groups, learners would benefit from synchronous and asynchronous learning using technology to provide foundational ML content and reinforce concepts. ML content must also be incorporated across the medical education continuum. Education of house officers and faculty physicians is necessary to enhance the likelihood that important conversations related to the strengths and limitations of ML take place in clinical settings.

Evidence-based medicine, which emphasizes incorporation of best research evidence, patient values and preferences, and clinician expertise, provides a proven framework for critically evaluating literature for risk of bias and applicability. Progress in the development of frameworks for critically evaluating studies and applications that include ML algorithms is only beginning. If ML is to be used in practice with regularity, users’ guides must be developed to allow clinicians to critically evaluate ML algorithms and teach learners to do the same. Although the risk of racial and social biases is now recognized, development of best practice guides will require an interprofessional effort that includes expertise from clinicians, computer scientists, engineers, statisticians, and epidemiologists. And let us not forget patients.

As noted by Nagirimadugu and Tippireddy, incorporation of ML into curricula provides an opportunity for interprofessional relationships between these stakeholders. Like how the nonclinical anatomist or biochemist currently plays significant roles in medical education, computer scientists and engineers will have equal—if not more important—roles in the medical education of the future. These relationships should extend beyond the formal teacher–learner relationships and into learner–learner alliances. Medical students and computer science students certainly have a lot to learn from one another in this domain.

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The Importance of Teaching Virtual Rapport-Building Skills in Telehealth Curricula

To the Editor: We thank Schifeling for bringing to the fore the necessity to develop comprehensive telehealth curricula for medical students in response to the COVID-19 pandemic. We agree that virtual patient visits require a different skill set from that used in traditional in-person patient interactions, one that students must be prepared to learn for their success as students and future physicians. As the author mentions, handling technical glitches, navigating the nuances of virtual history-taking, and grappling with the inability to perform a physical exam are areas that students must become accustomed to in the digital era.

We wish to add virtual rapport-building to this list of skills critical to new curricula, particularly because the impetus for such educational evolution is a time of unprecedented human suffering. Expressions of trust, acknowledgment, validation, and empathy are some of the most powerful tools medical students learn to employ in patient encounters. It is why the modern version of the Hippocratic Oath states that “warmth, sympathy, and understanding may alleviate the suffering of the sick.” Clinician empathy has been shown to increase patient satisfaction and compliance to treatment as well as to improve patient outcomes.3,4 Communication skills to convey such emotions rely as much on nonverbal cues as they do on verbal statements of support. Body language, eye contact, vocal tone, and facial expression can be delivered through videocam, but medical students must practice how to do these effectively.

Providing opportunities for students to engage in virtual patient visits is the best way to teach the building of digital patient relationships. Introducing video encounters with standardized patients into curricula, establishing systems for obtaining patient feedback on virtual communications skills, and using fellow students as practice partners with simulated cases via zoom or other technologies are the way forward. The ultimate endpoint of these skill-building exercises should be to have telehealth visits with actual patients accompanied by real-time physician teaching and feedback.

Medical students are healers first and foremost, in-person or virtually, so their ability to achieve rapport with their patients to better alleviate their suffering is essential to any telehealth curricula.

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