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.

Funding/Support: None reported.
Other disclosures: None reported.
Ethical approval: Reported as not applicable.

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Reference

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 outweigh the surgeon’s knife or chemist’s drug.” Clinician empathy has been shown to increase patient satisfaction and compliance to treatment as well as to improve patient outcomes. 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.

Acknowledgments: The authors would like to thank Mimoza Mehollari, MD, and Felise Milan, MD, for their guidance and support on thinking through this topic.

Funding/Support: None reported.
Other disclosures: None reported.
Ethical approval: Reported as not applicable.

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References
The Need to Study Physicians’ Changing Choices of Continuing Medical Education Modalities

To the Editor: As current medical students, we appreciate the survey conducted by Pott and colleagues exploring modality preferences for continuing medical education (CME) among providers. Survey respondents rated live activities the highest, followed by online learning. Although ratings were found to be similar across age groups, we recommend following how proclivities for different CME modalities might change with the next generation of physicians.

Those changes will be largely influenced by the changing preferences of the current generation of medical students. In the past decade, there has been an influx of highly standardized online medical resources readily available to medical students, created with particular emphasis on focused board preparation. Additionally, there has been a shift for medical schools to upload live classroom didactics into virtually accessible podcasts and videos. Students’ inclination for concise virtual materials may stem from appeals of convenience, efficiency, and self-pacing. These appeals also attract many younger physicians who favor CME activities via an online medium. This is not surprising because younger generations of both students and physicians are increasingly technologically savvy, as expected within the context of the digital age.

Furthermore, in the current era of COVID-19, students and physicians alike are forced to engage in more virtual encounters than ever before. Most medical schools have almost exclusively switched to online-based learning for didactic sessions. It is challenging to predict whether this dramatic shift will alter the overall learning styles of current trainees, including those who previously favored live attendance. We encourage medical students to engage in discourse with their schools’ faculty and administration to modernize the structures of curricula that were implemented before COVID-19.

In this context, we are curious to see if rising physicians prefer online activities for CME experiences. It is worthwhile for CME providers to study the educational trends of current medical trainees in an effort to anticipate shifts in generational learning tendencies. A deeper understanding of students’ preferred modalities will equip CME providers to pursue maximal instructional optimization, thereby improving the delivery of medical education. Such optimization of medical education modalities will ultimately translate to higher-quality health care delivery.

Funding/Support: None reported.

Other disclosures: None reported.

Ethical approval: Reported as not applicable.

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