VIEWPOINT

Medical Student Education in the Time of COVID-19

Suzanne Rose, MD, MSEd
Perelman School of Medicine, University of Pennsylvania, Philadelphia.

These are unprecedented times. Although the necessary focus has been to care for patients and communities, the emergence of severe acute respiratory syndrome coronavirus 2 has disrupted medical education and requires intense and prompt attention from medical educators. The need to prepare future physicians has never been as focused as it is now in the setting of a global emergency. The profound effects of coronavirus disease 2019 (COVID-19) may forever change how future physicians are educated.

This pandemic presents practical and logistical challenges and concerns for patient safety, recognizing that students may potentially spread the virus when asymptomatic and may acquire the virus in the course of training. This Viewpoint discusses the current status of medical education, describes how COVID-19 may affect preclerkship and clerkship learning environments, and explores potential implications of COVID-19 for the future of medical education.

Medical Student Education in 2020

For more than a decade, medical schools have been working to transform pedagogy by eliminating/reducing lectures; using technology to replace/enhance anatomy and laboratories; implementing team-facilitated, active, and self-directed learning; and promoting individualized and interprofessional education.[1,2] The development of entrustable professional activities and competency-based learning with identified milestones for achievement have transformed assessment. Many schools have decreased the basic science curriculum to 12 or 18 months while integrating clinical medicine within this timeframe and revisiting the basic sciences later in medical school.[3]

> The profound effects of coronavirus disease 2019 (COVID-19) may forever change how future physicians are educated.

Today, in most medical schools, students convene in physical settings during the first 12 to 18 months for interactive problem-solving or discussions in small groups; their physical presence in both inpatient and outpatient settings has been an unquestioned tenet of early clinical immersion experiences and the clerkship curriculum. The last 18 months of medical school may be individualized, with students participating in advanced clinical rotations, subinternships prior to residency, or scholarly projects. COVID-19 has the potential to affect students throughout the educational process.

How COVID-19 Affects the Preclerkship Learning Environment

Social distancing is the most effective preventative strategy since the emergence of COVID-19 pending development of a vaccine, treatment, or both.[4] By definition, this precludes students from gathering in learning studios, lecture halls, or small-group rooms. Within the past few years, many faculty were already "flipping" the classroom to provide individualized instruction for asynchronous learning "anytime/anywhere." However, students still convened for small-group interactions, laboratory sessions, simulations, and technology sessions (eg, learning bedside ultrasonography), as well as for clinical instruction with standardized patients and in authentic patient care environments.

In response to COVID-19, medical education faculty have quickly transitioned the entire preclerkship curriculum to online formats that include content in the basic sciences, health systems sciences, and even in behavioral sciences. Small-group formats convene online in virtual team settings, and clinical skills sessions may occur online or, in some cases, may be deferred. Examinations have also transitioned to online settings. Updating content material may be a benefit of the online format and virtual activities seem functional, but outcomes of these changes will require subsequent evaluation. The transition from the workplace or medical school setting to home results in isolation, an increased use of email, and struggles with establishing boundaries between work and home, which could affect faculty, students, and support staff.

How COVID-19 Affects the Clerkship Learning Environment

What exactly is the role of the medical student in the clinical environment? Ideally, the student is part of the team as a learner who requires supervision. Formation of students' professional identity relies on teaching and role modeling in these settings as students learn to prioritize patients and aspire to altruism. The next question then is what level of student involvement during a crisis best represents this prioritization? In other disaster circumstances, including natural disasters, blackouts, fires, and the September 11 attacks, students were able to continue their education and help in the effort. However, with the emergence of a highly contagious pandemic, students may transmit the virus unknowingly or contract the disease. Other contributing factors that limit the role of students in this clinical environment include lack of COVID-19 testing; diminished value of education, with cancelation of surgical procedures and routine appointments and the transition to telehealth formats; and lack of adequate personal protective equipment (PPE).

With the initial emergence of COVID-19, students were not involved in the care of patients with suspected or confirmed COVID-19, especially with the shortage of PPE. As infection rates increased, schools began

Corresponding Author: Suzanne Rose, MD, MSEd, Perelman School of Medicine, University of Pennsylvania, 3400 Civic Center Blvd, Philadelphia, PA 19104 (suzirose@upenn.edu).

© 2020 American Medical Association. All rights reserved.

Downloaded From: https://jamanetwork.com/ by Ravindranath Kolli on 03/31/2020

to remove students from the clerkship environment and on March 17, 2020, the Association of American Medical Colleges provided guidelines suggesting that medical schools support pausing clinical rotations for medical students.[5] However, specific geographic differences may lead schools to make individualized decisions based on unique circumstances.

What then could educators do to create experiences for students who are usually assigned to inpatient or outpatient rotations? The options are continually evolving but may include consolidating and moving clinical didactic sessions online earlier to allow for later entry into the clinical environment; creating and using available virtual cases; modifying the academic calendar to exchange later experiences (eg, scholarly work) and defer clinical rotations; and involving students in the telehealth environment, including electives based on experiences students are pursuing to enable them to assist and learn in this critical situation.

There is uncertainty regarding how long this situation will persist and increasing recognition that there may be periods in the future after reengagement in a "new normal" environment, in which quarantines and social distancing may again be required. The challenge is in providing authentic patient experiences for medical students as a key component of medical education under these circumstances. If schools defer clinical immersion experiences, there could be 2 full cohort classes of students in the clinical environment simultaneously and education could be adversely affected by the density of learners (which is already a problem in many geographic locations). Regarding accreditation, the Liaison Committee on Medical Education has provided resources to help medical schools.[6]

What Does the Future Hold?

The medical education environment is cross-generational. The former mindset that physicians would work when they were ill was considered to be altruistic and professional, with prioritization of the patient above the physician. However, the situation that COVID-19 represents is different. Clinicians who come to work while they are ill, as well as those who may be asymptomatic and silently incubating the virus, might facilitate transmitting the virus to others. Therefore, the culture of professionalism and altruism must be redefined and take into consideration the effects of potential actions, even with good intentions. This is all the more difficult because of the lack of COVID-19 testing and limited availability of PPE.

Additional unknown academic issues will require attention, including standardized examinations when testing centers are closed, the timeline for residency applications for current third-year students, and the ability to meet requirements for certain subspecialties prior to applying to residency (eg, away rotations).

However, learners across the continuum of education have participated in many ways to care for patients and communities in this crisis. In medical schools across the country, students are volunteering in call centers, creating patient education materials, and helping with grocery shopping, among other activities, while adhering to physical separation, safe travel (walking, biking, or personal car), and supervision.

Recognizing the possibility that the COVID-19 pandemic could result in a health care worker shortage, students may need to be engaged as part of the workforce and embedded in the clinical environment. This situation could change rapidly, and medical schools will need to be nimble and flexible in their response. Some schools are considering early graduation with preparation of fourth-year students to engage as either volunteers or as residents earlier in the clinical environment. The latter may require university flexibility with regard to the conferring of degrees as well as revised processes for licensure.

Conclusions

While in the midst of this COVID-19 crisis, it is crucial that the academic educational community learns from the experience and prioritizes a forward-thinking and scholarly approach as practical solutions are implemented. Reflection and evaluation must follow. For educators, the expression "make your work count twice" (the first time for the job you are doing and the second to get the work published and disseminated [eg, creating a curriculum that you plan to use for scholarship by publishing it]) and the plan for educational scholarship has never been more imperative. One area in which students can serve and have a positive effect is as educators to their peers, patients, and communities, using the tools available through social media and other modalities to help influence behaviors in a positive way.

The COVID-19 epidemic may represent an enduring transformation in medicine with the advancement of telehealth, adaptive research protocols, and clinical trials with flexible approaches to achieve solutions. There are many examples whereby learning from difficult experiences (eg, emergence of HIV, response to disasters) changed discovery, science, and patient care. Students and educators can help document and analyze the effects of current changes to learn and apply new principles and practices to the future. This is not only a time to contribute to the advancement of medical education in the setting of active curricular innovation and transformation, but it may be a seminal moment for many disciplines in medicine.

ARTICLE INFORMATION

Published Online: March 31, 2020. doi:10.1001/jama.2020.5227

Conflict of Interest Disclosures: Dr Rose reported receiving honoraria for educational consulting from another medical school and from organizations for speaking on mentoring and leadership and leading a course; receiving royalties for 2 books on topics unrelated to the content of this article; and leading the team at her prior institution to receive an American Medical Association Accelerating Change in Medical Education grant in the second call for proposals for a project related to electronic health record training.

REFERENCES

1. Irby DM, Cooke M, O'Brien BC. Calls for reform of medical education by the Carnegie Foundation for the Advancement of Teaching: 1910 and 2010. *Acad Med*. 2010;85(2):220-227.

2. Skochelak SE, Stack SJ. Creating the medical schools of the future. *Acad Med*. 2017;92(1):16-19.

3. Emanuel EJ. The inevitable reimagining of medical education. *JAMA*. Published online February 27, 2020. doi:10.1001/jama.2020.1227

4. Del Rio C, Malani PN. 2019 Novel coronavirus—important information for clinicians. *JAMA*. Published online February 5, 2020. doi:10.1001/jama.2020.1490

5. Important guidance for medical students on clinical rotations during the coronavirus (COVID-19) outbreak. Press release. Association of American Medical Colleges. Published March 17, 2020. Accessed March 23, 2020. https://www.aamc.org/news-insights/press-releases/important-guidance-medical-students-clinical-rotations-during-coronavirus-covid-19-outbreak

6. COVID-19 updates and resources. Liaison Committee on Medical Education. Updated March 25, 2020. Accessed March 27, 2020. https://lcme.org/covid-19/

© 2020 American Medical Association. All rights reserved.

Downloaded From: https://jamanetwork.com/ by Ravindranath Kolli on 03/31/2020