



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

Strategies for effective medical student education in dermatology during the COVID-19 pandemic



To the Editor: Recent publications have discussed that tele dermatology can serve as a tool in medical student education, enabling students to form differential diagnoses, document clinical notes, and discuss morphologies.^{1,2} Expanding on this topic, we share the structure of a completely virtual dermatology elective piloted at our institution during the coronavirus disease 2019 pandemic, with positive feedback from students, faculty, and patients. The innovative clinical rotation used asynchronous and synchronous telehealth and fulfilled 12 of the 13 Association of American Medical Colleges Core

Entrustable Professional Activities, which are skills students should develop before entering residency (Table I).³

In the 4-week elective, we assigned each student to work closely with 3 faculty members. Limiting the number of faculty was ideal because students learned the expectations, pertinent interview questions, clinical note formats, and subspecialty-specific diseases associated with each faculty member's practice. Spending substantial time with the same faculty enabled students to establish strong relationships with them and with patients, allowing enriched patient follow-up and enhanced learning throughout the rotation.

An important step for the virtual rotation included having faculty assign specific patients for students to evaluate. Subsequently, students called patients the

Table I. Methods through which the virtual dermatology medical student elective addresses the 13 Core Entrustable Professional Activities (EPAs) published by the Association of American Medical Colleges³

Core EPA	Methods to address this skill in the virtual dermatology elective
Collect a history and perform a physical examination	Students call patients to collect a history and describe morphologies based on photographs that patients submit. If students are unable to contact patients before the visit, they ask questions and describe lesions that they see during the televisit.
Formulate and prioritize a differential diagnosis	Students formulate and prioritize a differential diagnosis both in their oral presentation and in their clinical note.
Recommend diagnostic and screening tests	Students recommend diagnostic and screening tests (eg, biopsy, thyroid hormone levels).
Enter and write orders and prescriptions	Students enter electronic orders for laboratory tests and prescription medications, as well as write clear patient instructions on how to take prescribed medications on a section of the electronic medical record that is accessible to patients.
Document a clinical encounter in the patient record	Students write clinical notes for the patients they evaluate.
Give an oral presentation of a clinical encounter	Students give oral presentations for each patient they are able to call before the clinical encounter.
Formulate questions and retrieve evidence to advance patient care	Students conduct literature reviews to investigate treatment options for patients with uncommon conditions or those who have failed multiple therapies.
Give or receive a patient handover	Students give patient handovers to different specialists when a patient is referred to another specialist and students e-mail patient summaries to primary care providers or other providers.
Collaborate as a member of an interdisciplinary team	Students verify medications and dosages with other clinicians when patients take medications other than prescribed, coordinate imaging and laboratory tests with other teams, and coordinate SARS-CoV-2 testing for patients with COVID-19 symptoms who need to come in for in-person visits.
Recognize urgent or emergency situations	Students recommend patients come in for in-person dermatology visits that require biopsy and, when needed, recommend that patients present to the emergency department.
Obtain informed consent for tests or procedures	Students obtain informed consent from patients for laboratory tests (eg, HIV, syphilis), imaging, and biopsies (for patients coming in for in-person dermatology visits).
Perform clinical procedures	This EPA cannot be performed or assessed virtually. However, students can practice suturing and performing biopsies independently, using kits and instructional videos.
Identify system failures and promote a culture of safety	Students identify patients who have not been followed up by the appropriate providers or who have not undergone important laboratory or imaging tests.

COVID-19, Coronavirus disease 2019; EPA, Core Entrustable Professional Activity; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

day before clinic, obtained their verbal consent for student participation in their care by using a pre-specified script, collected a thorough history, and helped them electronically submit photographs of their skin findings. This process enabled students to prepare oral presentations describing morphologies and differential diagnoses and facilitated clinical encounters to efficiently address all patients' concerns. Furthermore, faculty had more time to provide patient and student education during visits because components of the visits were completed beforehand.

A brief virtual meeting between faculty and students before clinic was helpful in discussing the clinic flow for that day. This meeting also provided dedicated time to discuss faculty's expectations, students' goals, and feedback on students' notes from the prior clinic. Immediate feedback on student presentations was provided during the clinic session.

In the pilot, students participated in synchronous visits from home only; faculty first called students with Zoom or Facetime (based on patient preference documented by schedulers before the visit; both are hospital-approved virtual visit modalities) and then brought patients onto the video call. Overall, each medical student consulted with approximately 100 patients and saw a variety of conditions: new growths and rashes, follow-up visits for existing diagnoses, and subspecialty-specific diseases (eg, sarcoidosis, immunotherapy-induced skin toxicities). Students reported substantial learning and frequent faculty feedback. Patients, nearly all of whom were open to student participation, reported receiving thorough evaluations.

There were some limitations to medical student education with the virtual structure. For example, students were unable to observe or assist with procedures such as biopsies or cryotherapy. Also, they did not conduct full-body skin examinations.

Because social distancing guidelines for the coronavirus disease 2019 pandemic may limit the

presence of student trainees in dermatology clinics,^{2,4} we anticipate that teledermatology will serve a critical role in medical student education. The virtual dermatology elective that we piloted and described may serve as a helpful model as other institutions restructure medical student electives in the upcoming months.

Sepideh Ashrafzadeh, BS,^a Sotonye E. Imadojemu, MD, MBE,^{a,b} Ruth Ann Vleugels, MD, MPH,^{a,b} and Elizabeth A. Buzney, MD^{a,b}

From Harvard Medical School, Boston, Massachusetts^a; and Department of Dermatology, Brigham and Women's Hospital, Boston, Massachusetts.^b

Funding sources: None.

Conflicts of interest: None disclosed.

Correspondence to: Elizabeth A. Buzney, MD, Department of Dermatology, Brigham and Women's Hospital, 221 Longwood Ave, Boston, MA 02115

E-mail: ebuzney@bics.bwh.harvard.edu

REFERENCES

1. Su M, Lilly E, Yu J, Das S. Asynchronous teledermatology in medical education: lessons from the COVID-19 pandemic. *J Am Acad Dermatol.* 2020;83(3):e267-e268.
2. Loh TY, Hsiao JL, Shi VY. COVID-19 and its effect on medical student education in dermatology. *J Am Acad Dermatol.* 2020; 83(2):e163-e164.
3. Obeso V, Brown D, Aiyer M, et al. Toolkits for the 13 Core Entrustable Professional Activities for Entering Residency. Washington, DC: Association of American Medical Colleges; 2017. <https://www.aamc.org/initiatives/coreepas/publicationsandpresentations/>. Accessed June 28, 2020.
4. Oldenburg R, Marsch A. Optimizing teledermatology visits for dermatology resident education during the COVID-19 pandemic. *J Am Acad Dermatol.* 2020;82(6):e229.

<https://doi.org/10.1016/j.jaad.2020.08.068>