Hands Off Yet All In: A Virtual Clerkship Pilot in the Ambulatory Setting During the COVID-19 Pandemic

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Abstract

Problem

There is a paucity of guidance regarding implementation of telemedicine curricula at the clerkship level, particularly with students actively engaged in video and telephone encounters. The COVID-19 pandemic caused rapid shifts in the delivery of medical education to clerkship-level students. This article describes the successful pilot of a direct patient care, virtual health curriculum at the clerkship level and discusses lessons learned.

Approach

All 18 preceptors and 5 students at Stanford University School of Medicine, California, enrolled in the required 4-week family medicine clerkship in April 2020 were connected as virtual partners via a commercial video platform. The combined use of both this video program and Epic electronic health record (EHR) software as modes for teaching and patient care led to technical challenges and logistical hurdles. As part of an iterative process, clerkship leadership identified problems via preceptor and student interviews and integrated that feedback to create a model for delivering high-quality, clerkship-level clinical instruction during the COVID-19 shelter in place order.

Outcomes

Of those who completed an evaluation, the majority of preceptors (n = 16; 89%) and students (n = 4; 100%, 1 student did not respond) expressed satisfaction with the virtual, remote teaching model conducted over 37 clinic visits. A detailed 14-step process list resulted from identifying and addressing both audio and video technical challenges and is provided for use by other institutions that wish to implement this workflow.

Next Steps

Future directions include assessing patient perspectives on the involvement of students in virtual visits, soliciting patient input for a more robust patient–physician–student virtual experience, and integrating a multiparty platform, when available, via the EHR to afford greater student autonomy.

Problem

Before the COVID-19 pandemic, video-based telemedicine gained attention as an integral part of health care delivery. In 2016, the American Medical Association called for inclusion of core competencies in telemedicine in undergraduate medical education programs.[1] To our knowledge, however, there is no established set of learning goals, implementation best practices, or evaluation criteria for these competencies, and no systematic approaches to evaluating the effectiveness of teaching methods within a comprehensive virtual health curriculum in a required clerkship. The Accreditation Council for Graduate Medical Education Milestones only mention telemedicine once.[2] Telemedicine curricula in published literature rely primarily on asynchronous or simulated encounters[3,4]; there is inadequate guidance regarding telemedicine implementation with clerkship-level students engaging in live, virtual patient encounters.

In the spring of 2020, the COVID-19 pandemic caused rapid shifts in delivering medical education to clerkship-level students. On March 17, 2020, the Association of American Medical Colleges (AAMC) "released guidance strongly suggesting medical students not be involved in direct patient care activities."[5] Several medical students at our institution, Stanford University School of Medicine, had 1 required rotation during April 2020 still to complete before their graduation; 5 students had family medicine (FM) yet to complete. To meet the required FM clerkship learning objectives and follow AAMC guidance, the clerkship director and faculty created and implemented a wholly virtual ambulatory curriculum.

In this article, we describe a pilot program of a direct patient care, virtual health curriculum and detail the successes, barriers, and lessons learned in the rapid implementation of this educational innovation.

Approach

A total of 18 (6 senior, 12 junior) FM clinical faculty preceptors at 3 ambulatory practice sites affiliated with Stanford's medical school worked with 1 student per half-day shift (4-hour shift, approximately 8–10 patients per session) during the 3-week pilot intervention. All practice sites were located at either the home academic institution or its satellite community sites in northern California. All preceptors were experienced clinical teachers who had previously participated in traditional in-clinic clerkship-level instruction; none had additional information technology (IT) training. Faculty were selected because they were experienced preceptors who had already taught in the clerkship and were currently scheduled in clinic during the specific time period. Preceptors were allowed to opt out if they felt that adding on virtual teaching was excessively burdensome during the pandemic.

Faculty attended a required 45-minute webinar training on telemedicine

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sponsored by the clinical digital health team during the week that shelter in place (SIP) was announced in northern California. Before the SIP order, fewer than 10% of all patient visits were by video; 3 weeks later, that number increased to over 75% (555/741), with the remaining 23% (170/741) by telephone and 2% (16/741) in person.[6] Due to rapid turnaround between initiating telemedicine visits in the system at large and bringing students into the workspace, no additional faculty development for teaching in telemedicine was provided. All preceptors participated in video visits with their patients as part of their clinical duties for 2 weeks before the pilot.

The 5 students enrolled in the required FM clerkship during April 2020 were in their second clinical year and had to complete the clerkship as a graduation requirement. Students who were not graduating postponed their FM clerkship. Individual required clerkships autonomously decided how or whether to conduct their clerkships during this time period. Medical school leadership strongly supported the FM clerkship decision to provide remote clinical instruction. The students received a brief didactic introduction to telemedicine, including a discussion of communication skills and the practical mechanics of logging into sessions, during orientation.

All students had access to the institutional electronic health record (EHR), Epic (Epic Systems Corporation, Verona, WI), and teleconferencing technology from their home computers via a virtual private network. There were no ethical issues nor financial affiliations with the video platform selected; the U.S. Department of Health and Human Services allowed us of non-HIPAA compliant technology in this public health emergency.[7] This free platform was selected because of ease of use as well as familiarity to most users. Because the EHR did not offer multiparty access, the second video-based platform was necessary to facilitate video capability of 3 parties in 3 remote locations. The iterative process of developing and refining the process list (see List 1), detailing the steps needed to engage in a clinic session using a virtual platform/EHR model in real time, was born of necessity in the setting of the pandemic. Participants had no prior experience with these workflows, which had not been required before COVID-19.

List 1

Step-By-Step Workflow for 2-Program, 3-Party Telehealth Visits Including Previsit and Postvisit Tasks, From a Pilot Virtual Family Medicine Clerkship During the COVID-19 Pandemic, Stanford University School of Medicine, 2020

Previsit

- Log into VBP of choice with student
- Click on "share screen" in VBP
- View schedule in Epic and preround with student
- Confirm via "notes" section in Epic schedule that clinical medical assistant has obtained consent from patient to have student involved

Clinic visit

- Preceptor selects "stop video" on VBP; only 1 program can access the camera function of the computer, which needs to be the EHR/Epic
- Preceptor selects "share computer sound" in the VBP toolbar
- Begin video visit with patient by clicking on video icon in Epic
- Student scribes progress note remotely in Epic via VPN
- Student prepares after-visit summary for patient in Epic if requested by preceptor
- If time and set-up allow, student may unmute themselves in VBP to ask questions of patient or participate in visit
- End video visit in Epic

Postvisit

- Click "start video" in VBP to allow student to be able to see the preceptor
- Debrief with student via VBP after video visit ends
- Review student progress note in Epic and sign teaching attestation

Abbreviations: VBP, video-based platform; EHR, electronic health record; VPN, virtual private network.

Clinical faculty performed video visits using Epic either via clinic-based desktops or IT-approved home-based computers. Medical assistants consented patients to have a medical student involved in their care before initiating the video visit. The decision to conduct visits via telephone versus video largely fell to the preference of patients and their access to necessary technology.

Students prerounded with their preceptor and selected encounters for which the patient consented to student involvement in their care and video was available. Many in-person appointments that were scheduled before the pandemic were "converted" to video visits. Clinic visits addressed acute concerns, management of 1 or more chronic health issues, and/or preventative care needs for both pediatric and adult patients, as is typical for a full-spectrum FM practice.

Preceptors engaged their learners in patient-facing conversation and active clinical reasoning by asking the student to unmute themselves and ask any questions they had for the patients. In this way, preceptors used a modified 5-step microskills model,[8] asking the students "what do you think is going on?" and "what would you suggest for next steps?"

Preceptors and students provided qualitative feedback weekly to clerkship directors regarding logistics and flow. After the first week, technical problems were identified, and a step-by-step guide (List 1) helped to anticipate and troubleshoot common audio and video technical challenges. Qualitative feedback obtained in weeks 2 and 3 informed quality improvement and additional thematic analysis.

Outcomes

Thirty-seven medical student teaching video visits were conducted during the 3-week pilot. Of these, 57% (21/37) had no technical issues, 32% (13/37) had significant technical issues that were resolved before the end of the session, and 10% (4/37) of teaching sessions were abandoned completely to provide timely patient care. IT support was unavailable to assist with technical teaching issues as IT staff were prioritized to solve clinical EHR challenges. Doctors who encountered technical challenges, such as the patient or physician being unable to connect, converted their video visits to telephone; the option to convert to in-person was not possible due to the pandemic's constraints. Audio problems comprised 65% (11/17) of technical problems; video problems contributed to 23% (4/17) of visit challenges, and password access to the video platform prevented success in 12% (2/17) of visits.

Of the 5 participating students, 4 completed evaluations. Their overall rating of the quality of remote teaching was positive (average rating 4.75/5.0). Students reported active engagement and cited learning from observing bedside manner and clinical decision making from experienced preceptors (Supplemental Digital Appendix 1, at http://links.lww.com/ACADMED/B102). The majority of clerkship learning objectives, articulated in their patient logs (List 2), were achieved through these virtual encounters. Student learning was supplemented with use of online virtual cases and vetted online materials in the event that they did not encounter 1 or more clinical scenarios on their list of patient logs during 3 weeks of virtual visits.

Preceptors enthusiastically engaged in this clinical teaching innovation and the majority reported a positive experience (89%, 16/18) with the pilot intervention (Supplemental Digital Appendix 1, at http://links.lww.com/ACADMED/B102), even when faced with initial technical hurdles. Best practices included hands-on preparation from a member of the clerkship team, either before initiating visits via the process list (List 1) or via live support from one a clerkship director during the teleconference/Epic encounter. Preceptors reported satisfaction with student-authored progress notes (Supplemental Digital Appendix 1, at http://links.lww.com/ACADMED/B102), which included a high level of clinical reasoning and synthesis. They demonstrated their eagerness to showcase the breadth of practice still readily performed by primary care physicians, even within the constraints of video, and demonstrate the high quality of care delivered to patients. Preceptors noted the "double-edged sword" of student observation: students saw the juggling that occurred as preceptors toggled between screens within the visit, which highlighted the necessity of split attention between the patient interview and simultaneously attending to the EHR.

A virtual health objective structured clinical examination (OSCE), using standardized patients, faculty observers, and students all in remote locations, concluded the clerkship. The OSCE case discussed diabetes management and also covered key principles of successful telemedicine encounters; a detailed description of this remote, online, virtual OSCE will be described in a subsequent report. After performing in the OSCE themselves, several students reflected on how their preceptors deftly handled multiple issues within the constraints of one visit and that trying to navigate this independently during their OSCE only highlighted the challenges of time management in completing effective video visits. Students indicated that having the virtual health OSCE earlier in their clerkship would have primed them to observe effective communication skills more carefully in preceptor encounters; timing this earlier in the rotation is a consideration for a formative exercise in telemedicine skill-building.

List 2

Patient Logs for the Required Core Clerkship in Family Medicine, From a Pilot Virtual Family Medicine Clerkship During the COVID-19 Pandemic, Stanford University School of Medicine, 2020

Patient care

- Patient-centered care challenge/surprise
- Patient self-management challenge
- Initial presentation of an acute, undifferentiated, common problem
- Chronic illness, follow-up
- More than one chronic, interrelated conditions
- Integrative medicine clinic experience
- Hospice patient/end-of-life encounter

Clinical skills

- Interpersonal and communication skills challenge/improvement opportunity
- Patient physical exam challenge/improvement opportunity
- Medical knowledge/evidence-based medicine challenge
- Professionalism challenge/improvement opportunity
- Shared decision-making challenge/improvement opportunity

Systems

- Practice-based challenge/improvement opportunity
- System-wide or interdisciplinary challenge/improvement opportunity

Next Steps

The main limitation of this educational intervention, which we recognized before implementation, was restricted student autonomy. Due to the constraints of a 2-party view within the EHR, between the patient and the clinician, either student autonomy or technical feasibility for the patients had to be sacrificed. The clinical practices had implemented video visits within the EHR only 2 weeks before the implementation of this teaching pilot; while the idea of performing all the visits via the commercial video platform—bypassing the EHR completely—was discussed, it was decided that this could confuse the patients and overwhelm clinical staff such as medical assistants. For the future, multiparty platforms should be developed and implemented for the best patient–physician–trainee experience.

Many institutions will not have the bandwidth or computer processing capacity to run 2 videoconference programs simultaneously. This was a limitation in expanding the pilot to other community sites, and the requirements for this processing capacity likely accounted for the technical difficulties experienced during some of the encounters. Institutions seeking to implement a similar pilot should work closely with their IT departments to identify system needs and capacity to execute a project involving multiple platforms.

There were also limitations on patient engagement with the learner. Unlike in the traditional clinic setting, where a medical student first enters the room and independently performs the history and physical examination directly with the patient, there was little opportunity for direct interaction between the student and the patient in this model. This model raised the ethical challenge of the patient's inability to see the student observer, preventing transparency between student and patient. Because the EHR system did not allow the patient to enter their video visit until 5 minutes before their appointment time, the student could not "previsit" with them early.

Given the rapid turnaround of this intervention, patients were not surveyed regarding their perspectives on student engagement in this novel teaching model. Future work will include patient

surveys, as their feedback is invaluable in optimizing this process. The steep learning curve for preceptors to optimize teaching in the virtual setting while simultaneously providing medical care for patients may have affected the quality of patient care, which needs to be explored further.

Finally, any novel innovation, especially one with technical challenges, can create additional stress even for the most willing faculty preceptors, particularly around time management and patient rapport-building. When technological failures occur, this is disruptive to communication between patients and their care team, and it can affect both verbal and nonverbal connections. Future iterations of this implementation will ideally minimize technical difficulties. We hope that the lessons learned can help faculty colleagues more seamlessly integrate this teaching model in other clinical environments.

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