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TWELVE TIPS

Twelve tips for clinical teaching with telemedicine visits

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ABSTRACT

Telemedicine is now an established mode of clinical care for most medical specialties, and clinical teachers must teach and precept learners in this modality. However, faculty need training on how best to teach students when caring for patients via telemedicine. Effectively incorporating learners into telemedicine visits to optimize their education is a critical skill for clinical teachers. In this article, we review 12 practical tips unique to telemedicine to engage and educate undergraduate medical education learners in building their clinical skills. We outline synchronous and asynchronous elements before, during, and after the patient encounter to facilitate teaching while improving patient care. These principles can also be adapted for teaching in other health professions as well as postgraduate medical education.

Introduction

The COVID-19 pandemic has catalyzed the transformation of telemedicine from a relatively infrequently used tool for conducting patient visits to a critical healthcare and educational modality essential to the training of medical students. However, medical school faculty may not be prepared to teach learners via telemedicine: this paper closes that gap by providing practical tips for teaching medical students over telemedicine.

Telemedicine has proven to be a safe and effective delivery system with high levels of patient satisfaction (Barnett et al. 2018; Hollander and Carr 2020; Peden et al. 2020; U.S. Department of Veterans Affairs 2020). While the definition of telemedicine is broad and applies to clinical and educational settings as well as remote monitoring (American Telemedicine Association 2020), training in how best to conduct outpatient synchronous video visits has previously been identified as a gap in medical education (Waseh and Dicker 2019). Prior to 2020, telemedicine training was inconsistently incorporated into preclinical and clinical curricula at only a few medical schools (Jonas et al. 2019). Although further innovations in teaching learners about telemedicine and associated best practices have been made since the spring of 2020 in the wake of COVID-19 (Lawrence et al. 2020), most telemedicine curricula provide the foundation for telemedicine skills without adequate experience or active involvement of learners in synchronous virtual visits with patients (Dawson et al. 2020).

Given that telemedicine will likely persist as an important clinical modality for healthcare delivery and medical education, there is a pressing need to train medical educators to structure telemedicine visits in order to optimize learner engagement and clinical training. The American Medical Association (AMA) recently published four suggestions to build telemedicine into clinical training (Smith 2020). Here, we expand those recommendations to twelve specific and actionable strategies that clinical teachers can use to maximize the learning opportunities offered by telemedicine. For the purpose of this paper, we define learners as medical students. The terms clinical teachers and faculty are used interchangeably to identify medical educators.

Tip 1

Huddle with your learner before the virtual visit

When preparing for a telemedicine patient visit with a learner, preparation is key. Prior to the visit, huddle (in person or virtually) with the learner as well as any appropriate members of the care team to establish an agenda and set expectations. A brief, focused huddle can improve the experience for both the patient and the student (Scoville et al. 2016). Plan which patient(s) will be seen and the learner's role for each visit. A well-crafted plan and clear communication is particularly important for telemedicine visits when all parties are not in physical proximity. Review how long each visit should be and how the time will be structured. Agree on what aspects of the visit the learner will conduct and at what point(s) the clinical teacher will be present.

Discuss appropriate boundaries between learner, clinical teacher, and patient, specifically articulating how personal information (like phone numbers) will only be used for teaching and can be deleted after the encounter. Prepare the learner for potential safety and privacy concerns that may arise in telemedicine visits such as initiating a clinical visit when a patient is not in a safe environment.

Clarify expectations around visit documentation, providing a template when appropriate, and decide on a time for feedback. Specify if other modes of communication will be used between clinical teachers and learners to facilitate the visit: for example, communication via secure instant messaging can be helpful to indicate when to wrap up or transition to another topic or team member, or even share instructions or resources in real time. Time spent during the huddle preparing for the patient visit helps ensure that the learner feels well prepared, and enables the virtual visit to proceed smoothly for both clinical care and teaching (Gardner et al. 2018).

Tip 2

Plan for technology failures

Although telemedicine can be a powerful opportunity to both improve distance learning for students and increase medical access for patients, the potential for technology failure remains a limitation (Using Telehealth to Expand Access to Essential Health Services during the COVID-19 Pandemic 2020). Advance planning for the most common telemedicine technology challenges and communicating back-up plans are necessary to avoid frustration on behalf of the patient, the learner and the clinical teachers.

Most technology failures in telemedicine can be mitigated by advance planning. First, the lack of technical skills and proficiency with the telemedicine tools on the part of the clinical teacher, learner or patient can impede the conduct of the visit and take the focus away from clinical teaching. Because learning any new skill requires practice, learners should be instructed to practice with the selected telemedicine platform(s) before the visit. Patients and caregivers should also be offered access to training on the selected telemedicine platform(s) prior to the visit (Rheuban 2015), which may require the assistance of an interpreter when appropriate.

To minimize disruptions due to poor audio and/or video quality, clinical teachers and learners should establish a plan for an alternative telemedicine connection with the patient prior to the virtual visit. Solutions include switching to an alternative Wi-Fi connection or mobile hotspot if available, trying a telemedicine call without video, or switching to audio-only using a mobile phone or landline.

It is important to ensure that prior to the visit, the faculty member and learner identify which platform(s) will be used and exchange phone numbers to have an alternative mode of communication if the telemedicine platform fails. Secure message texts offer a rapid and real-time method to solve technology failures. Ensuring that the learner and clinical teacher have two device options available (such as a computer, tablet, smart phone, and/or landline) will allow a telemedicine visit to be converted rapidly to a different modality. In most circumstances, if video telemedicine fails, audio telemedicine via telephone is still possible. Set expectations that if any party is disconnected from the telemedicine encounter, they will try to rejoin via the original telemedicine modality and, if all else fails, they can rejoin on the phone.

Tip 3

Address the relationship between technology and health care disparities

Healthcare disparities are exacerbated by inadequate access to appropriately-powered smartphones and computers as well as limited and/or unreliable access to high-speed internet connectivity (Perzynski et al. 2017; Crawford and Serhal 2020). Some medical centers may offer the use of devices for patients and learners in need (VAntagePoint Contributor 2019). Clinical teachers should identify what resources and access options are available at their institutions and how to obtain them for learners and patients so that they are readily available if needed. Clinical teachers should address these barriers with learners prior to the clinical encounters and acknowledge the role that lack of video access may play in perpetuating health care disparities. At the same time, clinical teachers need to be explicit about the ways that high-quality care and education can be delivered via phone without video if necessary.

Language barriers also impact both technology and health care disparities. When needed, clinical teachers should ensure that an interpreter is available for the visit and that the student feels comfortable working with the interpreter during the visit. Interpreters may also be engaged prior to the visit to assist the patient in setting up the telemedicine platform. Whenever possible, professional interpreters should be used, not family members or friends. When appropriate, family members/caregivers can be invited to participate in the visit, with the patient's permission. This can be particularly helpful for patients with physical and/or cognitive impairments or for those who would benefit from technical assistance.

Tip 4

Plan ahead for feedback

Timely, specific, and actionable feedback is fundamental for learners' clinical skill development. When students are present on-site in a clinical setting, there are often opportunities for students to reflect in-person with clinical teachers about the clinical encounter and to receive feedback on their performance. With virtual encounters, these moments are less readily available, as all parties often disengage at the end of the visit. It is therefore important to plan ahead and decide with the learner when and how feedback will be conducted, whether immediately following the visit, at the end of the session, or at another time as previously arranged. Students may prefer to receive feedback via video rather than phone or email. Taking notes on student performance during the virtual visit will aid in providing feedback with specific and actionable examples. Clinical teachers should be sure to invite the learner to share their feedback on what is working for them and ways to improve the learning experience. Video visits may also provide an opportunity for direct observation; with the patients' and learners' permission, the clinical teacher could consider turning off their camera at times to be able to observe with less distraction.

Tip 5

Provide opportunities for the learner to engage with the patient prior to the visit

For medical students, engaging with the patient in advance of the visit can provide valuable information and training. For instance, students can greet patients, confirm that they are set up with the telemedicine platform and help patients who need assistance. If vital signs are needed, students can coach patients on how to use a home blood pressure cuff, thermometer, and/or scale, check their heart rate and observe their respiratory rate. Depending on the goals and structure of the telemedicine visit, students might start the visit in advance of the scheduled appointment time, similar to in-person clinical encounters when students enter the room first to take an initial history and perform a physical exam. Students can also use this opportunity to update the medication list, complete patient questionnaires, or make sure an interpreter is available if needed. Students can also identify who will be present for the visit including family members/caregivers. If students are expected to contact the patient prior to a visit, be sure that patient has been properly consented and students are provided with clear guidance regarding what is to be addressed. Additionally, ensure that students know whom to alert should any urgent patient concerns be uncovered during the pre-visit.

Tip 6

Foster the learner's relationship with patients

The nature of virtual visits can make it more challenging for learners to develop a therapeutic alliance with patients, which is crucial for creating meaningful learning experiences. This is especially important for medical students who may not have longer term relationships with patients due to the structure of their clinical rotations. Clinical teachers can take an active role in fostering the learner-patient bond using techniques practiced in the clinic that can readily be adapted to the virtual setting. First, be sure to obtain informed consent from the patient for the learner to participate in the telemedicine encounter. The student can introduce themselves, or their clinical teacher can make the introduction while clarifying the role of the learner in the encounter. The patient relationship can be fostered by defining an active role for the learner such as by asking the medical student to take the initial history or providing time for the learner to offer counseling and answer patient questions at the end of the visit (see tip #8: actively include the student). Clinical teachers can also set the expectations for a longitudinal relationship with patient in the appropriate context (see tip #10: promote longitudinal engagement with patients). This will help the patient recognize the learner as a member of the care team rather than as an observer.

Although empathetic statements are easily transferred to the virtual setting, nonverbal communication of empathy is more difficult. Clinical teachers can review the AMA's telemedicine visit etiquette checklist with learners, which describes actions that clinicians can take to appear professional and communicate their attention to the patient. For example, this may include narrating one's gestures, adjusting the webcam to eye level, and incorporating non-verbal cues to indicate that you are listening. (American Medical Association 2020; Onorato et al. 2020).

Tip 7

Build your relationship with the learner

Cultivating a relationship with the learner is critical to creating a positive learning environment. This will be more challenging in a virtual setting where students have less opportunity to engage in spontaneous conversations with their clinical teacher between patient encounters or at the end of the clinic day. Therefore, clinical teachers need to actively create opportunities for this type of informal conversation, such as scheduling a post-clinic huddle to debrief the visits. It is important that clinical teachers get to know their learners and be aware of their interests, strengths, and stressors (e.g., personal or family health issues, economic stress, adapting to on-line learning). Taking time to understand the student's learning needs and tailoring the clinical experiences to the learning objectives will help create agreement on mutual expectations for the visit and foster a supportive learning environment. Performing video visits from home also provides the opportunity for learners and clinical teachers to catch a glimpse of each other's home environment and creates an opening to share about one's self and work-life balance. Students value getting to know their clinical teachers on a personal level and envision how their future career might look.

Tip 8

Actively include the learner in the telemedicine visit

As with in-person precepting, learners' participation in patient encounters can vary based on their level of experience and learning needs, ranging from active observation to taking the lead in conducting the visit. However, the virtual platform of telemedicine visits may make it more difficult for medical students to read the non-verbal cues of their clinical teachers indicating that they can step in or take the lead at a certain point in the visit. This is especially true when the learner's role in the visit is not clearly established. Additionally, it is more difficult for students to enter the conversation or signal that they have a question. In order to avoid marginalizing the learner, clinical teachers need to intentionally pause during the visit and actively invite the student to ask additional questions, perform parts of the virtual exam or offer patient counseling. In situations where the clinical teacher must take the lead role, learners can 'actively shadow' by drafting the note, conducting a chart review for missing data, and/or finding patient education materials. If the learner is taking the lead in conducting the visit, clinical teachers should consider initially not being in the virtual room to promote autonomy when appropriate. Learners at all levels should be encouraged to take notes as questions arise during the visit that can be addressed later. Prior to concluding the visit, learners should be offered the opportunity to ask additional

questions of the patient, when appropriate, before debriefing the encounter with their clinical teacher.

Tip 9

Be adaptive

All clinical environments require faculty to be flexible, adapting their teaching strategies to the specific learning needs of their learner and the needs/preferences of their patients. Teaching styles can be adapted to challenges that occur specifically with the telemedicine encounter, such as helping learners develop language around coaching the patient to assist in performing a virtual physical exam. Recognizing and incorporating multiple teaching approaches for providing instruction in telemedicine, including both synchronous and asynchronous learning, will offer additional learning opportunities. Telemedicine visits may also present additional unique challenges: for example, patients attempting visits in inappropriate or suboptimal settings (such as video visits while driving or in a noisy or non-private space), privacy concerns with unexpected participants joining the visit, or technology failures. Clinical teachers adjusting to the unexpected and modeling flexible and adaptive professionalism as it relates to telemedicine can represent valuable teachable moments that reflect commitment to patient care. It is helpful to specifically prepare learners that the virtual visit conduct may need to be altered in real time (see tip #1: previsit huddle).

Tip 10

Promote longitudinal engagement with patients

Virtual care interactions, asynchronous from the telemedicine visit, provide learners with opportunities to work longitudinally with patients, enhancing their learning and helping to expand their relationship and commitment to the patient. Clinical teachers may consider the following approaches to extend learner engagement with their patients. Before the scheduled visit, students can review the medical record and then connect with the patient to initiate the history, perform medication reconciliation, obtain/update the social and family histories, and/or identify key concerns patients want to address in the visit.

After the scheduled visit, the learner can reconnect with patients to address outstanding patient questions, explore responses to treatment, and identify barriers to care such as difficulty obtaining testing or consultations. Virtual visits may be especially useful for chronic disease management. Learners can provide support for medication adherence, health monitoring, and coaching in lifestyle modification. Video 'home visits' to assess patient's home environment, evaluate for safety concerns, observe their system for managing medications, and gain insight into their pantry and diet can also be valuable for student learning and patient care. Additionally, learners can reach out to their patients who cancel or did not keep their appointment. Virtual post-operative, postnatal or brief follow-up telemedicine visits after hospital discharge are additional ways to engage students in longitudinal care and learning that are uniquely well suited to telemedicine. For instance, learners can perform telemedicine visits with patients in assisted living facilities or nursing homes where distance may have made the continuity of care with face-to-face visits more difficult.

Tip 11

Foster development of telemedicine clinical skills

Although the same spectrum of opportunities to identify topics of study before and after the visit exist in telemedicine as for in-person patient visits, three features are unique to telemedicine. First, learning how to perform a telemedicine exam is a new skill: clinical teachers should review techniques for using observation and performing selected portions of the physical exam that are pertinent and appropriate for telemedicine. Learners should be guided to review literature and best practice models on effective telemedicine practices (Onorato et al. 2020). They may use video software to record practice examples of their telemedicine visits with peers with permission for self-reflection, peer, or faculty asynchronous feedback. Second, not all patient issues are appropriate for virtual evaluation.
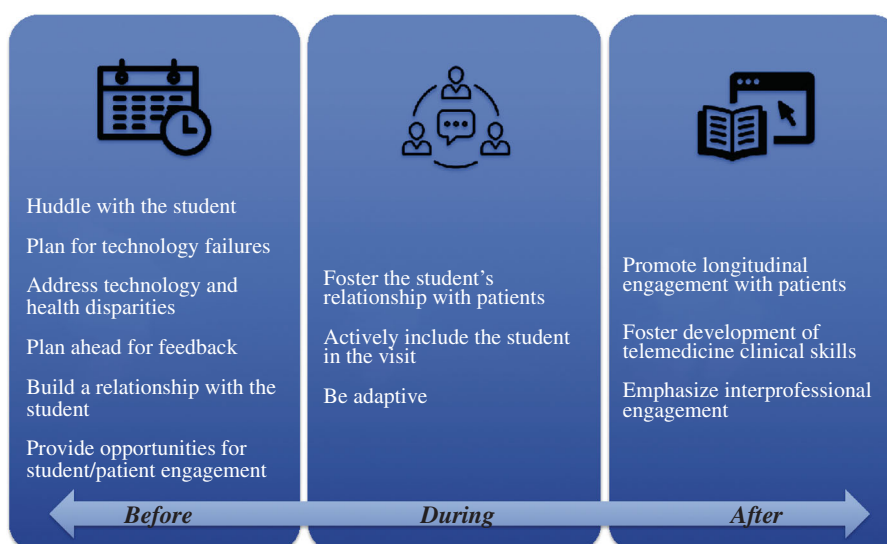

Before
- Huddle with the student
- Plan for technology failures
- Address technology and health disparities
- Plan ahead for feedback
- Build a relationship with the student
- Provide opportunities for student/patient engagement

During
- Foster the student's relationship with patients
- Actively include the student in the visit
- Be adaptive

After
- Promote longitudinal engagement with patients
- Foster development of telemedicine clinical skills
- Emphasize interprofessional engagement

Figure 1. Teaching learners using telemedicine patient visits: before, during and after.

Before the visit		
Huddle with the student	☐ Establish an agenda for the visit ☐ Review the timeline ☐ Review which parts of the visit the student will conduct ☐ Discuss privacy and safety ☐ Plan for visit documentation	
Plan for technology failure	☐ Instruct the student to practice with the telemedicine platform ☐ Plan for an alternate connection ☐ Discuss how to deliver care without video if necessary ☐ Exchange contact information with the student	
Address technology and healthcare disparities	☐ Identify resources available at your institution ☐ Acknowledge the role that telemedicine plays in healthcare disparities ☐ Model professionalism when working with interpreters	
Plan ahead for feedback	☐ Determine if direct observation will occur ☐ Determine when feedback will be given ☐ Prepare to take notes on the student's actions	
Build your relationship with the student	☐ Create opportunities for informal conversation ☐ Identify learning goals ☐ When appropriate share aspects of your personal interests such as hobbies	
Provide opportunities for student/patient engagement prior to the visit	☐ Ask the student to reach out to the patient before the visit to assist with telemedicine platform setup, obtaining vital signs, or updating the medical record ☐ Consider having the student begin the visit, with proper patient consent ☐ Provide clear instruction for communication of urgent concerns	
During the visit		
Foster the student's relationship with patients	☐ Obtain informed consent ☐ Introduce the student ☐ Encourage the student to take an active role in the visit ☐ Set expectations for a longitudinal relationship ☐ Communicate empathy	
Actively include the student in the visit	☐ Invite the student to ask questions ☐ Invite the student to direct the physical exam ☐ Invite the student to educate the patient	
Be adaptive	☐ Incorporate synchronous and asynchronous teaching methods ☐ Model adaptive professionalism	
After the visit		
Promote longitudinal engagement with patients	☐ Encourage learners to engage in follow up of patients seen ☐ Invite students to learn more about a patient's home environment ☐ Ask students to reach out to patients who did not keep their appointments	
Foster development of telemedicine clinical skills	☐ Review and provide feedback regarding telemedicine physical exam techniques ☐ Review appropriate patient triage and any in-person evaluation recommendations made ☐ Review literature accessed during the visit	
Emphasize interprofessional engagement	☐ Encourage students to ask questions to and communicate with interprofessional team members involved in the visit	

Figure 2. Telemedicine clinical teaching checklist.

Learners can develop their clinical reasoning skills by participating in video or telephone triage to determine if a patient requires an in-person visit. Third, telemedicine affords learners the opportunity to perform real-time literature searches to answer clinical questions and utilize electronic medical resources at the point of care while remaining engaged with the patient. Learners can share diagrams, images and patient education materials with the screen share function during the patient encounter.

Tip 12

Emphasize interprofessional engagement

Interprofessional teams who are not co-located can work together on a telemedicine visit to collaborate, provide team-based care to patients, and make it possible for learners to benefit from participating in visits with and learning from interprofessional team members. For instance, students can learn by observing an assessment by a nurse, physical therapist, and/or a nutritionist, and having an opportunity to ask questions after the visit either synchronously or via email (Brock et al. 2013). Telepsychiatry has been another critical aspect of care during COVID-19 and, when appropriate, learners may also have the opportunity to collaborate with mental health professionals during telemedicine visits to gain insights into interprofessional mental health care.

After collaborating in a virtual visit, learners may feel more comfortable communicating with other team members in follow-up after the encounter, asking questions and managing future care. Learners can also reach out to visiting nurses or home health aides to assist homebound patients who might otherwise have difficulty navigating the video interface. This may result in the added benefit for medical students of allowing them to practice taking histories from both the patient and their caregiver as well as, with patient permission, working with caregivers to request assistance with the physical exam. By allowing video visits to expand interactions with the interprofessional team, learners may improve their team-oriented communication skills and their knowledge of the roles of other team members, both key goals of interprofessional education (Core Competencies for Interprofessional Collaborative Practice. 2016 Update 2016).

Conclusion

Telemedicine is a powerful modality to provide care for patients who are physically remote; the training to successfully deliver this care must be incorporated into medical education. Although many of the tenets of clinical precepting carry over from in-person to telemedicine visits, this model of care delivery offers unique challenges and opportunities for clinical teachers, learners, and patients. A systematic approach to the before, during, and after phases of the telemedicine visit offers clinical teachers a framework for teaching learners (see Figure 1). Figure 2 offers a Telemedicine Clinical Teaching Checklist to help clinical teachers and learners prepare for their clinical encounters.

To overcome the potential difficulties of teaching within the context of virtual patient visits, particular attention must be paid to planning for the learner's role and overcoming possible technology failures. Timely and effective communication with both learners and patients with a focus on being intentional with non-verbal interactions, speaking clearly and deliberately and narrating actions is essential. Clinical practices vary in terms of the amount of time allotted per patients, availability of translators and support staff, the availability of interprofessional teams. The 12 tips outlined above represent a best practice model which can be adapted to different clinical settings and resource limitations.

Telemedicine visits can provide increased opportunities for learners at all levels to engage meaningfully in patient care, develop longitudinal relationships with patients and clinical teachers, as well as interprofessional team members, and thus be a powerful modality for clinical teaching. Moreover, the telemedicine visit offers a unique opportunity for learners to gain experience with a model of care that is likely to be increasingly integrated into our healthcare delivery system in the future. It is therefore imperative that clinical teachers take steps to facilitate learners' education using this modality. Telemedicine is an evolving and emerging field and further study on learner-centered telemedicine best practices should be conducted.

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