Lemonade from Lemons—Using COVID Downtime to Teach Essential Telemedicine Skills

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**Abstract**

As a result of the COVID-19 pandemic, the use of telemedicine has rapidly accelerated. Our orthopaedic department created a telemedicine educational program for residents using standardized patient scenarios. Training residents to use telemedicine will help them navigate through unforeseen issues that otherwise may have never been a consideration. This is not only useful for today's climate but also potentially for the duration of their careers.

**Telemedicine**

Telemedicine is the practice of medicine using technology to deliver care at a distance. Telemedicine has been around for many years and used primarily in rural areas with limited access to specialty health care. As a result of the COVID-19 pandemic, the use of telemedicine has rapidly accelerated. For some, it has become the preferred method of care delivery secondary to its ability to maintain social distancing.

COVID-19 has forced us to move away from the classical paradigms originally taught in medical school and relearn how to interact with patients. Graduate medical education programs are faced with the reality that residents have not been formally trained in this method of communication. Our orthopaedic department felt it would be an ideal time to develop a telemedicine education program using standardized patient (SP) scenarios. Our goal is to create a telemedicine teaching format specifically for residents. We looked to identify obstacles in performing a telemedicine visit.

**Obstacles**

1. Setup
2. Physical examination
3. Assessment and recommendation

**Setup**

The integral aspects of setting up a telemedicine visit are the connection, video and audio quality, and the Internet connection bandwidth.

Many platforms can accommodate a telemedicine visit. To date, there are more than 100 different telemedicine software products available. Current software not only provides Health Insurance Portability and Accountability Act–compliant video conferencing but also charting, E-prescribing, self-service portals, file sharing, waiting room capabilities, and more. As products do differ in services offered, costs can vary greatly.
Because we used SP scenarios and our residents were previously trained on the use of SPs, we simply began each session with a statement of confidentiality. We used a WebEx platform allowing residents, attendings, the technical staff from our simulation center, and the trained SP to all sign on together. As a resident and SP interacted, the rest could observe and comment using a “Pause and Reflect” format.

While easy to approach telemedicine in a casual format, patients expect a physician to be professionally dressed and the video environment to duplicate a professional office. This was maintained among our residents.

The quality of a video picture is based on the resolution of the camera as well as video compression and bandwidth of the Internet connection. Although potentially underestimated, room lighting plays a significant role with video quality. Taking time to adjust the room lighting at both ends can improve the quality of the image considerably. Our residents were shown ways to improve proper lighting: minimal back lighting with adequate glare-free lighting and taking time to ask the patient to clean their lens with a soft lint-free cloth. The lighting should be positioned behind the camera. Placing the lighting in front of the camera will create glare. Also, it is best if the video camera is stationary on a firm foundation, such as at a desk or table, placed a few feet directly in front of the patient.

Audio quality is equally as important as video quality. The volume of a someone’s voice decreases under the inverse square rule, but the background noise will remain the same. If the patient does not have a quiet room free of background noise, then asking the patient to use an earbud headset with a built-in microphone will improve the sound of their voice.

High-quality video and audio require a high-quality Internet connection. Video, more than audio, requires the ability to transfer larger amounts of information. Bandwidth is the maximum amount of information a network can transfer. This is often measured in Mbps or megabits per second. Internet connections whether wired or wireless vary greatly in their bandwidth, which may in turn limit audio and video quality. As the bandwidth limit is approached, the picture may become pixelated and choppy. The audio may break up, and the connection could be lost.

It is more likely that the quality of the connection can be improved at the provider end. Wired connections with a high-quality commercial Internet connection rather than wireless office network connection will be the most reliable. Speedtest.net by Ookla is a reliable free test that can be used to measure both upload and download speed. However, this does not correlate with a particular bandwidth number.

It is much more difficult to assure that the patient has a quality connection, but a cable Internet connection with a high-quality wireless system should suffice. A cellular phone connection with 4G wireless network might be sufficient if the signal quality is strong. In areas of fringe coverage, the experience may prove frustrating. If unable to maintain effective communication, the encounter should be transitioned to a phone call and then an in-person appointment if necessary.

Setting up an encounter can be cumbersome. We found it best to have a medical assistant trouble shoot the connection within a half an hour before the scheduled appointment to make sure the appointment can be done timely and efficiently. The medical assistant should also be available at the end of the encounter to assist in the coordination of postvisit details as they would for an office visit (i.e., prescriptions, imaging studies, and follow-up).

Telemedicine visits are typically scheduled per request of the patient when contacting an office through telephone. Providers allot for telemedicine appointments in their clinic schedule. Appointments that are best suited for telemedicine are those that are nonurgent in nature. This could be new patient appointments, post-op appointments that do not require intervention, and follow-up appointments for conditions being managed nonsurgically. Imaging studies could be coordinated before a telemedicine appointment for previously established patients in which their diagnostic study is properly indicated. A provider should speak to and examine a patient before ordering any study. Acute injuries or conditions that require testing, manipulation, or intervention are better suited for an in-person visit.

Billing for telemedicine appointments has presented new challenges for providers. Not all commercial insurance plans cover telemedicine visits, and coverage under Medicaid is up to each state. Before COVID-19, a litany of standards would have to be verified to receive reimbursement from payers that did cover such visits. This would include which telemedicine platform was being used, patient location during the interview, length of time spent for the appointment, and more. Administrators would be required to review virtual appointment for quality control and to avoid the issue of upcoding. This would be done on a monthly or quarterly basis through programs that select interviews at random for evaluation (i.e., WebEx and Microsoft Teams).

However, in this era of COVID-19, a federal mandate and state parity laws were passed requiring private payers to reimburse for telemedicine care the same way they would for in-person care. This was done to put patient safety first and alleviate factors limiting people from seeking the care they need. Providers must be thorough, document, and code properly, with a “modifier” to indicate that the service was offered through interactive video conference. Provider documentation must also include length of time spent with the patient and an acknowledgment that the patient consented to a telemedicine visit.

**Physical Examination**

Medical history and physical examination are key to diagnostic accuracy. While taking a patient’s history may be straightforward, attempting to perform a remote physical examination is not. A lot of information can be obtained within the first few moments of a physical examination: patient’s level of distress, grimacing, gross appearance, swelling or deformity, range of motion, and ability to walk. This is true of both remote and in-person examinations.

The ability of the examiner to instruct the patient on how to aid in their own examination is crucial. Using layperson terms instead of medical jargon keeps the patient more at ease. Describing why you are asking a patient to perform certain maneuvers helps to educate the patient and allows them to play a more active role in their own health care. Preprinted diagrams could further assist the examiner in instructing the patient.
Having the patient recruit an additional person, such as a nearby family member, to help them with their examination may be useful. If the patient has a cognitive issue or demyelinating disease, this is particularly helpful. They could assist in assessing muscle strength of the lower extremities or supporting an extremity to better isolate and examine a joint. A family member can perform parts of the examination and report the findings, such as grip strength.

The residents were taught to have proper visualization during the examination. That may mean asking the patient to redirect their camera or move their seat a few feet further away from the camera. If you cannot see what the patient is doing, the remote examination becomes less reliable.

A study of 492 patients in a general pediatric practice compared diagnostic agreement for a cohort of patients receiving both a telemedicine and in-person evaluation. In this study, telemedicine diagnoses agreed closely with in-person diagnoses for complaints not involving the ear (89% vs. 90%, p = 0.65). However, among patients with ear-related symptoms, diagnostic agreement was worse (82% vs. 94%, p < 0.02)7. Interpreting data from a remote physical examination can be challenging. Findings that are easily observed can likely be observed accurately through telemedicine, but more invasive elements that require special lighting, perspective, or tactile components may be much more limited.

Delivering the Assessment and Recommendations
Explaining your impressions and recommendations to a patient is a nuanced process that relies on patient feedback, verbal and nonverbal, to guide the content and speed of delivery. Much of that feedback can be lost in telemedicine, especially if there is a suboptimal video connection.

Frequent pauses to allow the other party to speak will help alleviate this. Interjections such as “are you with me?” or “do you have any questions so far” will help.

We designed our SP scenarios to provide ambiguity of patient expectations. We wanted our residents to experience challenging patient interactions in the setting of telemedicine. After each session, we would have a debriefing to identify pitfalls and discuss strategies to overcome them.

Most residents began to feel more comfortable with telemedicine after as few as 2 sessions. The first session offered some foundational tools (i.e., how to perform a virtual physical examination and how to discuss options for staying home vs. coming to the clinic/hospital), which allowed the second session to run more smoothly. These scenarios helped the residents build critical thinking skills in a different setting than they are accustomed to. Also, having the virtual platform with multiple attendings present allowed for immediate constructive feedback for the residents.

Conclusion
A study of 1,734 patients found a 95% satisfaction rate from those who participated in a MinuteClinic telemedicine visit. They rated telemedicine as better than or “just as good as” a traditional visit because of the quality of care, ease of use, timeliness, and convenience6. Telemedicine has shown to be useful in decreasing missed appointments, decreasing wait times, decreasing readmission, and improving medication adherence6. Training residents to use telemedicine will help them navigate through unforeseen issues that otherwise may have never been a consideration. Such training could also be very beneficial to medical students in the clinical phase of their education. This would not only prove to be useful in today’s climate but also potentially for the duration of their careers.

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