Telemedicine OSCE ("TeleOCSE"): Rural Diabetes

Abstract

There is a severe shortage of primary care physicians in the U.S., especially in rural areas. Telemedicine has the potential to address this shortage by making it easier for providers to connect with remote patients. To better prepare providers for this new practice mode, simulated telemedicine experiences should be incorporated in medical education. The Oregon Health & Science University (OHSU) Family Medicine clerkship telemedicine OSCE (TeleOSCE) places learners into the role of a rural physician consulting via telemedicine with a remote, rural patient. The TeleOSCE serves as a standalone experiential education activity during the required 5 week Family Medicine clerkship that exposes learners to a new model of rural care. It also logistically allows a clerkship to administer an OSCE activity to remote learners. The TeleOSCE can be easily adapted to meet the needs of different institutions and is administered using cost-effective, internet-based videoconferencing software. Materials included are the TeleOSCE case with checklist and implementation instructions as well as an informational guide with a video clip and setup guide.

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Structure of clerkship in which curriculum has been used

The Family Medicine clerkship is a required third year clinical rotation at OHSU. It takes place over five weeks and occurs during the third year of medical school. Rotation size ranges from 15-20 students with currently 140 students completing the clerkship each year. There are 24 family medicine clerkship sites that represent a broad range of clinical practices, including Patient Centered Medical Home clinics, Federally Qualified Health Centers, one Rural Health Center and community practices in Portland, Bend (160 miles from Portland) and Eugene (110 miles from Portland).

National Clerkship Curriculum Objectives addressed

Patient-centered communication skills

- Demonstrate active listening skills and empathy for patients.

- Demonstrate setting a collaborative agenda with the patient for an office visit.
- Demonstrate the ability to elicit and attend to the patient's specific concerns.
- Explain history, physical examination, and test results in a manner that the patient can understand.
- Demonstrate the validation of the patient's feelings by naming emotions and expressing empathy.
- Effectively incorporate psychological issues into patient discussions and care planning.
- Use effective listening skills and empathy to improve patient adherence to medications and lifestyle changes.
- Describe the treatment plans for prevention and management of acute and chronic conditions to the patient.
- Reflect of the personal frustrations, and transform this response into a deeper understanding of the patient's and one's own situation, when patients do not adhere to offered recommendations or plans.

Psychosocial awareness

- Discuss the influence of psychosocial factors on a patient's ability to provide a history and carry out a treatment plan.

Patient education

- Describe the patient education protocols and programs for core chronic illnesses at their assigned clerkship sites.
- Identify resources in a local practice community that support positive health outcomes for diverse patients and families.

Comprehensive Care

Lifelong learning

- Assess and remediate one's own learning needs.

Contextual Care

Person in context of family

- Conduct an encounter that includes patients and families in the development of screening and treatment plans.
- Demonstrate caring and respect when interacting with patients and their families even when confronted with atypical or emotionally charged behaviors.
- Demonstrate interpersonal and communication skills that result in effective information exchange between patients of all ages and their families.

Person in context of community

- Discuss local community factors that affect the health of patients.
- Discuss health disparities and their potential causes and influences.

Person in context of their culture

- Communicate effectively with patients and families from diverse cultural backgrounds.
- Discuss areas where culture can impact the ability of patients to access and utilize health care.

Continuity of Care

Barriers to access

- Describe the barrier to access and utilizing health care that stem from personal barriers.
- Describe the barriers that patients encounter to accessing and utilizing health care that stem from their particular community
- Describe the barriers stemming from the health care system that affect the ability of patients to obtain and use health care.

Coordination/Complexity of Care

Team approach

- Describe the value of teamwork in the care of primary care patients.

- Discuss the roles of multiple member of a health care team (e.g., pharmacy, nursing, social work, and allied health).
- Participate as an effective member of a clinical care team.

Quality and safety

- Recognize clinical processes established to improve performance of a clinical site.
- *Examples of learning objectives include:*
    - Describe the use of a quality improvement protocol within a practice and how the protocol might improve health care.
    - Describe methods of monitoring compliance with preventive services guidelines.
    - Describe how one of the core chronic diseases is monitored in the assigned clerkship site.
    - Describe how narcotic use is managed and monitored in the assigned clerkship site.

Program Content and Educational Methods

Students participate in the TeleOSCE as part of their required teaching OSCE clerkship activity. The teaching OSCE is a formative assessment occurring during the second week of the five week clerkship. The student begins the TeleOSCE by reviewing a student prompt outside of the OSCE examination room door. The prompt reveals the student is on locums in a rural clinic and will engage in a telemedicine encounter with a patient who is diabetic with a sore on his toe.
The student then enters the room where a laptop computer with a webcam is set up. The standardized patient (SP) is on the computer screen in a simulated telemedicine environment. The environment is Adobe Connect, a popular online meeting software (other software, such as Skype or GotoMeeting, can be substituted for Adobe Connect). The student then sits in front of the laptop and begins the encounter with an actor portraying the patient. As this is a telemedicine case, the actor is interacting with the learner via their own computer/webcam and is physically at a different location (of their choosing).

Three competency domains are assessed in the TeleOSCE. The first is clinical knowledge. The learner must identify diabetes management issues and recommend an appropriate follow-up plan. The student is able to download a picture of the patient's toe and blood sugar levels and should interpret this as the patient needs medical attention. The second domain is patient-centered use of technology. The student is usually unfamiliar with the technology interface so he/she must

quickly figure out how to download the picture of the toe and the CBG values (how to do so is included in the student prompt). The learner must remain patient-focused despite the unfamiliarity of the technology. Finally, the TeleOSCE assesses the student's understanding of the socioeconomic realities of rural patients. The patient reveals he had a similar problem with his toe a month ago and was sent 200 miles to the nearest hospital only to find out the trip was unnecessary. As a result, the patient is resistant to traveling again and the student must take this into account when negotiating a plan of care.

In addition to on-campus students, remote students can also participate in the TeleOSCE. The remote student enters the encounter from his/her own computer at a set time, is electronically given the student instruction when he/she begins and then engages in the encounter as described above. The SP, faculty member and staff support all participate online as well (the TeleOSCE is designed to be a flexible experience and so is staff support and even faculty presence is optional if an institution chooses to provide all feedback by the SP). In this way, the TeleOSCE solves a logistical problem of centrally administering an OSCE to a remote student while also exposing students to a new model of rural patient care. Detailed instructions pertaining to room setup, faculty observation and uploading of documents is below. Also refer to the TeleOSCE Information Guide for further detail on the TeleOSCE setup.

Room setup

The following are two setup options for how to set up the video conference for the TeleOSCE

<u>Option A: Student and faculty in same physical location.</u>

This option works well if running the TeleOSCE for an on campus clinical assessment. For this scenario, the student reads the prompt for the TeleOSCE outside the clinical assessment room door. Upon entering the room, there should be a table set up with a laptop computer on top of it. On this laptop the standardized patient (SP) will be waiting for the encounter via the videoconferencing software of choice (Adobe Connect, Skype, Google Hangouts, etc.). The student should sit down in front of the computer and begin the encounter.

Faculty observation

The OHSU TeleOSCE is part of a teaching OSCE, meaning the assessment is formative and the faculty member is in the room with the student. If using this format, the faculty member should be seated in a location allowing her to clearly observe the student interacting with the SP on the computer screen. Alternatively, the faculty member may also observe remotely via the videoconferencing software. In this case, the software must allow for group video chatting (Most videoconferencing software, such as Skype and Google Hangouts, allows for free group chatting). If the faculty member does observe remotely, then she should turn off her webcam during the clinical encounter so as not to distract the student from his interaction with the SP. When the encounter is over the faculty member can turn her webcam back on (Toggling

webcams on and off is managed through the settings of the videoconferencing software being used).

If faculty members are not observing, then the feedback can be delivered by the SP via the videoconferencing software at the conclusion of the clinical encounter.

Option B: All parties virtual

Option B should be used if administering the TeleOSCE to a remote student. In this scenario, all parties- student, SP and faculty member (if used), and technical support staff (if used)- connect virtually via the videoconferencing software. Note: One must utilize videoconferencing software that allows for group video chatting in order to implement Option B. All parties except the student should be "in" the virtual meeting room prior to the student "entering" the virtual room. The student should have already received a specific time that she is supposed to enter the videoconferencing room. When it is time to begin, the student should either request entry into the room (if using software like Adobe Connect) or be "called" into the room (if using software such as Skype).

Upon entering the virtual room the student should be given instructions that she is to read the prompt and then begin the encounter with the SP. These instructions can be transferred to the student by the technical support person, faculty or even the SP. How the prompt is delivered to the student in the virtual room is dependent on the software being utilized. If using Adobe Connect, the prompt should be uploaded using a Share pod (Adobe Connect utilizes differ types of screens, called pods, inside the meeting room software interface. A share pod is a screen that allows for the sharing of content during meetings. Detailed information on share pods and Adobe Connect is available here: http://help.adobe.com/en_US/connect/9.0/using/WSA21A7B23-7EFD-4afd-A290-6B404F31D529.html. The student can enlarge the pod to read the prompt and then minimize it when ready for the clinical encounter. If using Skype, the prompt can be delivered by sending it as a Word file via the filer transfer functionality built into Skype (See details on how to do so here: https://support.skype.com/en/faq/FA3091/how-do-i-send-and-receive-files-using-skype-for-windows-desktop). As previously stated, there are many other videoconferencing options one may use to run the TeleOSCE but, if utilizing setup Option B, it is important that the software has the ability to transfer files to the student during the encounter in order to meet the needs of the TeleOSCE. A potential workaround if using a program without file transfer capabilities is to email the files to the student while the encounter is taking place, though this would require additional instructions to the student in order to make sure she has her email up and running during the encounter.

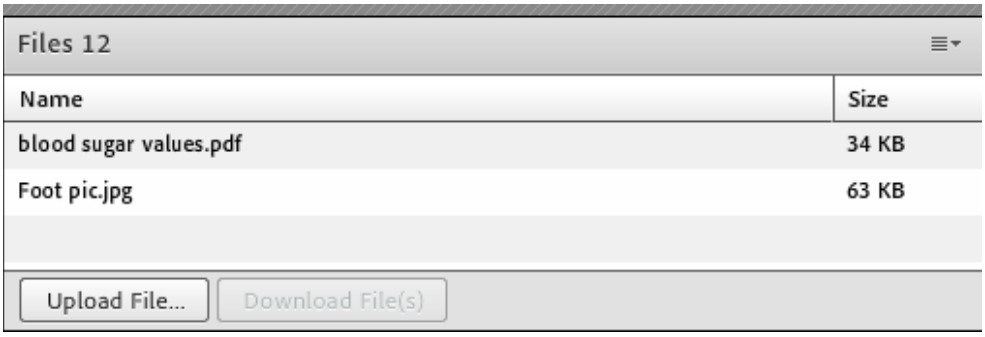
Faculty Observation

If faculty are giving feedback for Option B, then the faculty member should be virtually present during the encounter with his webcam paused or muted inside the virtual meeting room (Adobe

Connect, Skype, Google Hangouts and other videoconferencing software all have the ability to toggle one's camera on and off during a web meeting). When the encounter is over, the faculty member may give feedback by turning his webcam back on or just giving audio feedback. If the SP is giving feedback, then he should do so immediately following the clinical encounter.

Uploading foot picture and sugar values documents.

The task of discovering the picture of the foot ulcer and the rising lab values is a critical step in the TeleOSCE. Doing so serves as the "technological stumbling block" and forces the student to deal with technology interference while staying patient focused. As detailed in the included case, the student is prompted that the patient has the ability to upload pictures and his glucometer readings via the telemedicine interface. Therefore, when the student asks the patient to describe his foot sore and/or his sugar values, the SP will tell the student that he uploaded them to the system and the student will be compelled to find them, download them, interpret the information and come then up with a plan- all while staying patient focused. Thus, the ideal TeleOSCE setup will have both the sugar values and the foot picture present in the meeting room when the encounter starts. If using Adobe Connect, this is accomplished by uploading a document of the foot picture and a document containing of the sugar values to a File pod (Explanation of a File pod is available here: http://help.adobe.com/en_US/connect/9.0/using/WS11d1def534ea1be08a52b610b38bfaa95-7f53.html) for the student to download when ready.



Screenshot of the File pod containing the foot picture and sugar values in Adobe Connect.

If using alternative software like Skype, then it is important that the foot picture and sugar values are transferred to the student for download at the point in the encounter when the student begins searching for them. In this case, the student prompt might change slightly to state the patient is able to transfer the files to the student in real time vs. already having uploaded them. Regardless of the configuration, the student should have to deal with the technology to get critical diagnostic information for the case.

"Low-tech" alternative for Setup Option A

If the technological transfer of the picture and values proves too difficult or unfeasible based on the videoconferencing technology, the picture and values may be printed out and put in a folder

next to the laptop computer. The student scenario in this case would be modified slightly to state that the patient has emailed the information to the physician's office. When the student asks about the values and/or picture, the patient will say something along the lines of, "I emailed you that information, and don't they usually print it out for you?" This will prompt the student to look around and he should discover the folder (perhaps put a sticky note on the folder reading "emailed from Mr. Baker"). This technique serves to break the student's attention away from the patient to get information and so accomplishes the task of assessing the student's ability to remain patient focused despite "interference." Note: this option cannot be utilized with setup Option B where all parties are remote. In Option B files will have to be transferred via the technology interface using the techniques detailed above.

Assessment Strategies to achieve outcomes

The TeleOSCE is part of the teaching OSCE excersice that takes place during the OHSU Family Medicine clerkship. The teaching OSCE is a formative assessment in which FM clerkship students progress through several simulated clinical encounters over approximately 4 hours. All students are required to participate in the teaching OSCE and all students will receive a pass for doing so regardless of how they perform on individual stations. Faculty members are present at each station and fill out a checklist while also giving students real-time feedback at the conclusion of their clinical encounter. Students are able to review their checklist scores at a later date. As the assessment is formative, students are often assessed on information that they have not yet been exposed to. In such cases, students learn from their expereince and identify knowledge gaps in a safe learning environment with constructive criticism and feedback. Thus, the TeleOSCE works well as a formative assessment as students are able to "get their hands dirty" with telemedicine in a safe learning environment and take key learning points with them to real-world telemedicine experiences they may take part in.

The TeleOSCE checklist provides an assessment tool to measure a student's performance on 1. diabetes management 2. patient centered use of technology and 3. understanding of the patient's rural context and perspective. Additionally, faculty and standardized patient feedback provides further opportunity for both clinical and telemedicine learning. For example, students are often told to look into the camera when addressing the patient to give the illusion of making eye contact with the patient though the computer screen. Students also are able to do a self-evaluation of one of their OSCE encounters at the end of the clerkship, with many choosing to do with the TeleOSCE.

Student feedback about the TeleOSCE has been positive. Students frequently identify the TeleOSCE as a valuable learning opportunity in their end of rotation feedback. Additionally, student interviews from a feasibility study (currently in manuscript) revealed that the experience was an eye-opening one for many students as they previously thought telemedicine was only

utilized in acute care situations with expensive Telehealth robots. This year the FM clerkship will apply a pre-and post-assessment to measure if student knowledge around telemedicine improves as a result of participating in the TeleOSCE.

Lessons Learned

- The TeleOSCE has been well received by both students and faculty. Students report the TeleOSCE made them more aware of new practice models.
- The TeleOSCE is easily adaptable. The scenario can be adapted to fit the needs and contexts of different institutions and learner levels (e.g. residency programs). Any videochatting technology can be used that has file transfer capacity (for the CBG values and foot picture). Popular videoconferencing technologies, like Skype, have this capacity.
- The TeleOSCE can effectively expose students to a new model of primary care for rural and underserved populations.
- Several institutions plan on implementing the TeleOSCEs into their own programs. OHSU is currently collaborating with two other medical schools to create a telemedicine curriculum that will utilize the TeleOSCE as a competency assessment.
- In addition to rural contexts, tele-visits are growing in popularity as a convenient manner for some urban visits in ambulatory care settings.

Appendices

Appendix A: Copy of the TeleOSCE case. The case included standardized patient instructions, student prompt, OSCE checklist and detailed instructions on how to implement for both on campus and remote learners.

Appendix B: TeleOSCE Information Guide. Contains a screenshot and short video example of the TeleOSCE, setup instructions for both on-campus and remote learner implementations and an equipment list.

References

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