**Notes on remote examination of clinical skills**

Research from Duke-NUS Medical School, Curtin Medical School, Curtin University, and Singapore General Hospital (2020), present a solution for ﬁnal year clinical performance examinations during the COVID-19 pandemic. This paper outlines design and implementation of OSCEs. These were facilitated using: Strict infection control and personal hygiene; segregation of all participant groups including by patient, student, faculty and healthcare institution; social distancing; Zoom-facilitated brieﬁngs; wiﬁ-enabled data gathering from iPad-based OSCE scoring system; no large group gatherings. No changes were made to the content of the OSCEs which consisted of: 1) clinical examination 15 x 12 minute stations, including history taking, clinical examination and explanation/advice skills being tested, together with clinical decision making, diagnostic acumen and management planning; 2) practical skills 10 x 8 minute stations, in professional interactions with patients, including explanations, consent, and patient safety. Students were briefed during the month before the examinations were scheduled. Those who fail will have a supplementary exam after two months. Take home message: think imaginatively, be ﬂexible.

Cantone et al (2019) implemented the Insomnia–Rural TeleOSCE for students in second, third, or fourth year using a case study of a patient with depression in a medically underserved area. N=287 students participated as a formative experience and received immediate feedback. TeleOSCE assesses competencies in a safe environment whilst improving student understanding of barriers to care and the utility of telemedicine. Faculty can directly assess distance students on their clinical reasoning and patient communication skills. Students read a prompt outside of the virtual room and then complete the case in 11-13 minutes (depending on timing and number of students, then enter the room to ﬁnd a participant connected via live video streaming on a monitor in the room. The same software and patients were used whether the student was on campus or remote. Students in remote locations, were instructed to review a checklist to understand performance clinically and with the software. The OSCE was completed early in their clinical rotation (by the second of 4 weeks) so that they could implement the feedback in the latter half of their rotation. Student feedback indicated that they needed more practice, more speciﬁc instructions, more time to complete the scenario, and fewer technical difficulties, although in real life contexts patient care is undertaken under tight time pressures. Take home message: perhaps extend time to allow students to completely grasp the technology.

Bree (2018) reviews the use of digital technology for assessment in sciences and health, observing that there efficiencies to this method including faster evaluation and a reduction in missing, or erroneous, data. eOSCE (<http://eosce.ch/>) provide this method using three components: an easy to use iPad app which enables examiners to assess the candidates performance, a macOS desktop app which is used to schedule and prepare the examination data, and a mobile iPhone app that can be used to monitor the examination state and alerts the administrator in case of any technical problems. All examination data is digitally encrypted and stored securely and reliably on a server. An exam preparation manual sets out very specific tasks at three month, one month, two week, one week, and day before intervals to prepare the examination <https://eosce.ch/support/exam-preparation/> Take home message: Significant efficiencies, however, whilst there is training for examiners there does not appear to be any similar facility for students.

UCL Medical School (2019) using Speedwell software piloted digital remote OSCEs in February 2018 with first-year formative assessment of an 8 station OSCE, prior to use for the first summative OSCE exam in May 2018. Take home message: Benefits in efficiency and timeliness experienced by all participants.

Farahmand et al (2016) completed a study in Tehran University or Medical Sciences with N=120 senior medical students divided into a distance learning and traditional learning group. The control group attended a workshop with a 50-minute lecture on a case simulation scenario followed by a hands-on session. The distance group received a DVD with a similar 50-minute lecture and a case simulation scenario and attended a hands-on session to practice the skills. Both groups were evaluated by a trauma station OSCE after a month. The distance learning students performed better in the trauma station compared to the control group. Take home message: a telemedicine course can be as successful as on site learning and does not require internet access where repeat watching of the DVD is available.

Palmer et al (2015) conducted a pilot program in Oregon Health and Science University, USA, to study implementation of remote OSCE examination (teleOSCE) in 2013 and 2014, via Adobe Connect video-conferencing software, cell phones and a primary care focused diabetes management case. The telemedicine scenario reflected a real-world remote consultation situation whereby a GP interacts with a rural patient. This approach addressed the difficulty of remote examination whilst also giving students experience of rural patient care. Three competency domains were assessed:(1) clinical knowledge of diabetes, management issues, and follow-up, (2) ensuring a patient focus whilst using technology, and (3) understanding the context for rural patients. Each student was given a specific appointment time in a virtual exam room. One non-clinical faculty member served as the meeting operator to provide technical support for the session, and a clinical faculty member served as the observer. Each encounter lasted 20 minutes, with 15 minutes for the clinical encounter and 5 minutes for feedback. All participants utilised their own computers and cell phones. Take home message: teleOSCE to remote learners is both financially feasible and acceptable to students.

Finally, Imperial College London recently became the first university to deliver fully online OSCEs. Students in their sixth year of medical studies logged in at 1pm on their exam day to demonstrate their ability to diagnose a patient’s condition. They were presented with a patient and given their history, findings from clinical examination and data from investigations such as blood tests. They then had to answer 150 questions in three hours, meaning they had 72 seconds to answer each one. Clinical / academic staff refer to the fact that: “It wasn’t possible to answer questions that require putting all this information together by simply looking things up online, this is exactly like having a patient in front of you.” The papers were marked automatically online and will be analysed and compared to previous closed-book exams. If results are comparable this may lead the way for a change to medical assessment.”

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