Virtual SIMsanity: strategies for successful simulation for medical educators during the era of social distancing

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Telesimulation has overcome challenges created by the COVID-19 pandemic and social distancing. It requires a videoconferencing platform, audiovisual equipment and an internet connection. While learner feedback is favourable, there are issues to be aware of and address. This letter discusses strategies for successful telesimulation (table 1).

TELESIMULATION SET-UP

Commercially available telecommunication platforms, such as Zoom, are available which most instructors and learners are familiar with and which most institutions own the licenses to so there are no additional out-of-pocket expenses.[1]

Audio quality should be maximised for the instructor and learner. Instructors may be able to use the microphones and speakers built in the computers. Lapel microphones or headsets with built-in microphones may improve the audio experience for learners. Learners should be advised to wear earbuds or headphones in order to better appreciate any low-pitched sounds, such as heart or lung sounds. There may be delays in audio causing interruption of the session. Slow and clear hand signals may be effective should this occur.[2] The 'chat' function can also be helpful in bridging audio lag and to communicate with learners who may be having microphone issues or are tentative about speaking up.[3] If the instructor is using more than one computer or phone, remember to mute both the microphones and speakers on any additional computers to eliminate disruptive audio feedback. In any enclosed space, only one computer or phone should have an active microphone and speaker.

Video should be tested for lag and to eliminate distracting background items. Multiple cameras enhance the session by offering different perspectives of the clinical environment. This may reduce telecommunication quality and should be appropriately balanced.[2] A dual monitor set up is helpful in navigating the functions of teleconferencing software. This requires one computer with two side-by-side monitors. The first monitor can be used for the 'share screen' function, which may project additional media for learners to view, while the second can be used to display the Grid View, so that the instructor may see as many learners as possible at once. One additional solution is to set up a second computer as a 'confidence monitor'. The confidence monitor allows the instructor to log into the teleconference software twice. The instructor is the presenter on their main computer. On the confidence monitor, they can see the telesimulation from the learners' perspective. This gives the instructor a real-time view, allowing them to quickly notice and correct any issues that learners may be seeing.

Have technical support on standby, a plan to reconnect to the session if interrupted, and a back-up plan for a different teleconferencing platform if problems cannot be overcome.[2 3]

VIRTUAL LEARNING ENVIRONMENT

Set learner expectations in the prebrief. Ask for volunteers or select participants and designate the remainder as observers. Clear roles will eliminate learners speaking over one another or hide during the session. Instruct observers to mute their audio. In some cases, it may be helpful to have them turn off their video camera to eliminate distractions. The instructor should consider doing the same.[4] Participants should be encouraged to speak during the session especially when interacting with simulated patients (SPs) as opposed to using the chat function. Conversely, observers are encouraged to text to make suggestions, ask questions, and provide feedback. Rotate role assignments if there are multiple sessions.

Learner reticence in virtual debriefing may be overcome with instructor prompting. Setting the teleconferencing software to Grid View again helps, as the learner's name is usually shown at the bottom of their video feed. This allows instructors to encourage students by name, especially in scenarios where one learner may be dominating the discussion. Inform your learners if you plan to do this.

Telecommunication issues and social distancing may lead to learner frustration. Instructors should acknowledge and validate these. The debriefing session is a good time to discuss them. Be transparent; let your learners know that it is your intention to improve the experience. Ask for their feedback to shape future courses. Also, recognise that learners are more receptive of feedback with a preexisting instructor-learner relationship and a supportive peer group. It may be difficult to replicate the auditory and visual cues that occur in person that build a sense of connection, and to pick up on learners' emotional cues and vulnerabilities. Use the prebrief for introductions and learning participants' names, maintain the same cohort if possible, maintain eye contact, which may require looking at the camera and not the learners' faces

Table 1 Recommendations for conducting telesimulation

Telesimulation domain	Recommendation
Technology	► Dry-run telecommunications software ► Provide headphones to learners for physical examination findings ► Use a confidence monitor for quality control ► Have a back-up plan
Instructors	► Introductions and set learner expectations/etiquette ► Use Grid View to monitor learner participation and emotions ► Modify debriefing technique if needed ► Provide immediate learner feedback ► Solicit learner feedback and collect outcomes data
Scenarios	► Adapt pre-existing scenarios to the virtual format ► Work with remote SPs ► Employ smaller groups, for example, 4–6 learners ► Match fidelity to your time, resources and learning objectives
Innovation	► Reach remote learners without access to simulation ► Establish new collaborations and partnerships across sites and healthcare systems ► Retrain staff and clinical workflows ► Develop and train staff for telehealth programmes

on the screen and behave in an empathetic and collegial manner. This may be aided by using the Grid View.[2]

VIRTUAL SCENARIOS

Virtual scenarios are diverse and range in preparation and fidelity, from prerecorded to live action. The clinical space can be occupied by 'on-site' SPs, an embedded nurse, and instructors while learners view video remotely. This can be flipped with learners on-site and instructors remoting in.[4] Prerecorded and live action formats may be combined, using video clips to advance the live action scenario. Some creative examples that our group used include virtual escape rooms with YouTube videos and locked Microsoft Word documents, and cardiac arrest scenarios using a streaming digital stethoscope. A dry run for SPs to practice their role is also important since much of the focus will be on adapting to the telecommunication technology.[3] SPs should be briefed on the format and learner etiquette for telesimulation.

BENEFICIAL CONSEQUENCES

Telesimulation increases learner access to simulation, especially where it is lacking.[2] Expert simulation instructors can share their wisdom with more learners and offer guidance to new instructors.[4] Telesimulation forges new relationships between hospitals and their satellites, between different healthcare systems, and between educators and geographically remote learners.[4] Telesimulation can used internationally among healthcare systems with different cultural practices, medical guidelines and languages.[5] During the COVID-19 pandemic it was used to retrain staff and modify clinical practice. It is also a natural development towards telehealth training.

CONCLUSION

Telesimulation requires preparation, patience and adaptation, but has comparable efficacy and satisfaction to traditional simulation. Further experimentation and data collection are required.

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REFERENCES

1 Ahmed RA, Atkinson SS, Gable B, *et al*. Coaching from the sidelines: examining the impact of Teledebriefing in simulation-based training. *Simul Healthc* 2016;11:334–9.
2 Renouf T, Parsons M, Francis L, *et al*. Emergency management of tension pneumothorax for health professionals on remote cat island Bahamas. *Cureus* 2017;9:e1390.
3 Major S, Sawan L, Vognsen J, *et al*. COVID-19 pandemic prompts the development of a Web-OSCE using Zoom teleconferencing to resume medical students' clinical skills training at Weill Cornell Medicine-Qatar. *BMJ Simul Technol Enhanc Learn* 2020;6:376–7.
4 Hayden EM, Khatri A, Kelly HR, *et al*. Mannequin-based Telesimulation: increasing access to simulation-based education. *Acad Emerg Med* 2018;25:144–7.
5 McCoy CE, Sayegh J, Alrabah R, *et al*. Telesimulation: an innovative tool for health professions education. *AEM Educ Train* 2017;1:132–6.