

Zoom Clinical Teaching of Medical Students During COVID-19

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At The height of Circuit Breaker when students were disallowed from the clinics and wards, and COVID-19 raged on all fronts during the pandemic, the mission of medical school to train the next generation of doctors continues unabated. Unfazed and led by Dr Victor Loh, Assistant Professor and Education Director of Family Medicine, the team of dedicated adjunct family practice (FP) tutors at the Yong Loo Lin School of Medicine, National University of Singapore persisted, prototyped and enabled medical students in the third-year family medicine posting to continue with clinical learning through remote Zoom-enabled clinical teaching.

Q1. Despite the current technological advancement, using Zoom as a pedagogical strategy in clinical teaching is largely unheard of. What has necessitated the NUS Family Medicine Department to make such a move?

Dr Victor Loh (VL): Video-streamed medical content teaching is not new. It has been used in countries like Australia with large rural settings that need to train medical students across large geographical distances, mainly through lectures and tutorials from afar. When COVID-19 hit we found that we could neither gather students at NUS, nor could we send them for placements at the wards or clinics. Out of necessity, we explored the possibility of using the video streaming platform for teaching. I would say that how we innovated was less about video-streamed medical content teaching which we did, but more about how we overcame social distancing to provide what clinical teaching we could by allowing our students to encounter real patients in the clinics through the Zoom platform. COVID or not, medical school must go on and we have a duty to enable our doctors-to-be to be ready for the frontlines one day.

Q2. How did you feel about venturing into something unknown like this?

VL: To give some background, at the height of circuit breaker, students were banned from all clinical settings, and organisationally, we were only able to work with our private family practice (FP) tutors to consider this possibility. What was clear was that we needed to quickly come up with an innovative and practical solution to meet this unprecedented situation. Thankfully, I was in communication with Drs Lee-Oh Chong Leng and Leong Choon Kit who piloted the use

of Zoom for clinical teaching and who convinced me that this was an option to consider. To be honest, I was not sure how real-time Zoomed clinical teaching would be received by our adjunct family practitioner faculty. I remember it was at a 5.30pm on a Thursday evening on 23 April, almost three weeks after the start of Circuit Breaker when 14 adjunct family practitioners from across the island Zoomed in for a huddle and discussion. Among the tutors were many who were just getting used to the idea of using the Zoom video-streaming platform. It was to this group that the idea was first mooted. Chong Leng and Choon Kit who successfully

piloted the use of Zoom for clinical training shared their experience, tips on the use of devices, and advice on the range of clinical cases that could be suitable for teaching. In the end, we managed to get the support of enough tutors to provide clinical teaching to the 78 students who were in the family medicine posting. I was amazed and much relieved at the end of the meeting. I felt a deep sense of gratitude and respect for my

FP colleagues for their determination to train our medical students despite the hurdles imposed by the need for social distancing. I would like to acknowledge all the tutors and my admin team who have made this project possible.

Q3. Was there support from the institution?

VL: Absolutely. Vice-dean was very supportive. The medical school was and remains determined to ensure that it provides students with a quality clinical learning experience. The education dean gave us the green light so long as we kept close watch on key safeguards: in particular those of patient confidentiality, patient safety, and that of student



Dr Leong Choon Kit with patient and student on zoom during FP remote clinic attachment session.

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safety. And I am thankful for my administrative team that was able to adapt to the massive changes that we had to implement at short notice.

Q4. Now that circuit breaker is over, do you foresee that NUS will return fully to on-campus teaching?

VL: I don't think we are quite out of the woods yet. I think we need to be clear about the strengths and weaknesses of the platforms we use for teaching. There are key aspects of clinical teaching that can never be replaced by the video-streaming platform. While Zoom can efficiently deliver content through webinars, tutorials and lectures; and students may even be able to interview patients on Zoom, and observe clinical signs, nothing can replace the need of students to be physically present in clinics and hospitals to interact in-person with actual patients. Aspects such as physical examination skills, non-verbal communication, and being present with patients cannot be replaced by the video-streaming platform. My sense is that COVID has and

will impact medical teaching post-COVID. Perhaps the trick is to find the right balance. Having said all these, I think we need to ready ourselves for the uncertainty that lies ahead. The number of COVID cases in the community appears to be going down but we need to recognise how places such as Melbourne and New Zealand whose numbers were low just a month ago have seen a resurgence. As a medical school we need to be able to adapt rapidly, to provide in-person clinical teaching as much as possible, and to always be ready to adjust to safe distancing using video-streaming and whatever other means possible when necessary. That would demand of tutors and the education team to be incredibly adaptable. We have learnt to convert our program from live teaching to video-streaming rapidly over 2 weeks. It is now August, and now that conditions are improving, we are now preparing to re-introduce the students back to the in-person placements at the clinics. We need to be flexible to make sure that our students get the best learning experience in as safe an environment as possible.

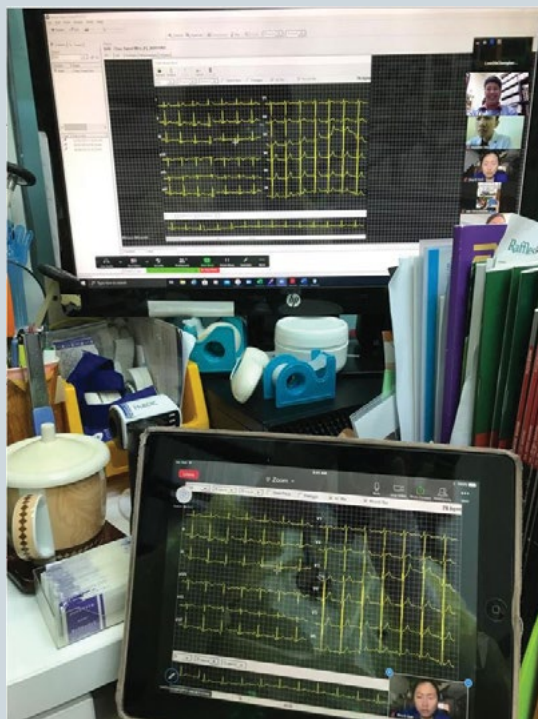
Working with Dr Victor Loh, Dr Leong Choon Kit and Dr Lee-Oh Chong Leng who piloted the use of video-streamed clinical training, have been instrumental in brain-storming and putting in place the processes required for the Zoom-enabled Family Practice remote clinical attachment to occur. They share some of the solutions for overcoming a number of the initial teething problems that would be encountered in this uncharted territory:

Firstly, the technical aspect needs to be set up. A good, fast and reliable broadband is needed. Institutional Zoom accounts should be used, and depending on configuration, up to four devices in the consultation room may be used: the main PC, main handphone, viewing handphone, and tablet device. The problem with audio interference from multiple devices is solved by muting all, but one, device. The Zoom platform has features that allows it to be efficiently used as a teaching tool. The share screen function allows the students to concurrently see the notes typed into patient's record and the medications dispensed.

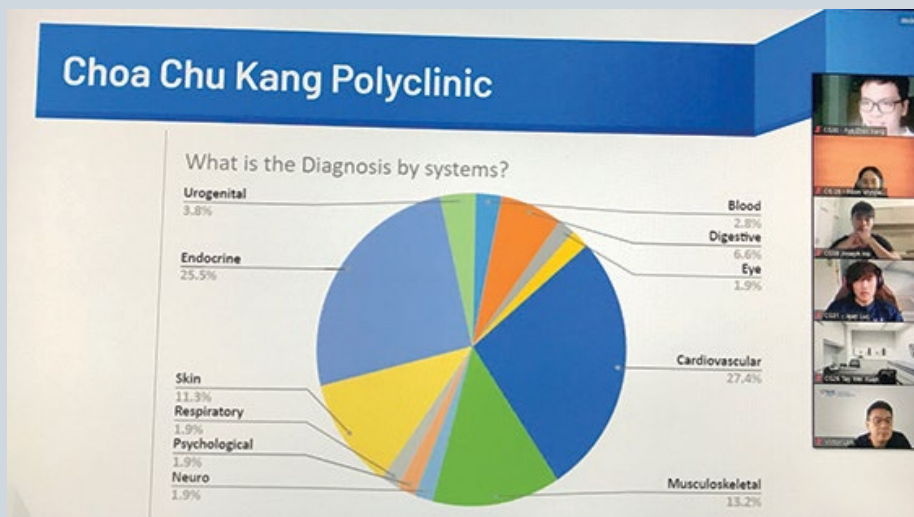
The white board function allows tutors to scribble, doodle and annotate for the students. PowerPoint slides and videos can be shared. In addition, tutors may communicate with students using encrypted WhatsApp for discussions. Internet downtime which may occasionally occur can be painful and disruptive for learning.

Secondly, confidentiality has to be strictly observed. Students are required to show their faces all the time. They are not allowed to record consultations, and no one else is allowed to view the consultation. Most patients are surprised to see students on Zoom but cheerfully give their consent to be clerked by the students. There is the option for selected patients to Zoom from home and be clerked.

Thirdly, capturing and retaining students' attention is a constant challenge. There is pressure to keep engaging the students during the consultation with patients, which can be draining for tutors. To ease this, each session can be rounded off with a summary



Dr Lee-Oh Chong Leng's PC and mobile iPad gadgets put to maximal usage for zoom tutorial with medical students. (Dr Lee is seen in the top right corner)



Dr Victor Loh zoom mentoring year 3 medical students on Family Medicine Project Presentation. (Dr Loh is seen in the bottom right corner)

and discussion of every case with breaks inserted in-between the sessions. While some students spend their time note-taking and searching information of the net concurrently, some others may not be so attentive behind the PC. Verbal questions or online polls peppered in the sessions are strategies to ensure that students remain attentive.

After the prolonged period of home-based learning and relative social isolation, most students in the posting were happy to meet actual patients even if it was on Zoom; they enjoyed trying to apply the voluminous theoretical learning they had engaged in while deprived of the clinical setting. Learning from their homes was not without advantages: they saved on travelling and had more time for study and rest. The Zoom platform allowed students to quickly switch from one clinic setting to another should a case or procedure of interest be live-streamed. What previously could be demonstrated to just 2 to 3 students present at the clinic at one time could now be streamed to a larger group. For instance, a clinical group of 6 students could be brought for a house-call consultation on Zoom. Students benefited from observing different FP tutors with different patient profiles, different areas of deep interest, and different styles of consulting.

Chong Leng observed that the Zoom platform heightened students' observatory skills – the deprivation of physical contact with patients was impetus for them to sharpen their powers of observation by looking for visual and auditory cues of disease and distress. Students learn to profile the patient the moment the patient enters the consultation room. In addition, Choon Kit used the Zoom platform to Zoom into the consultation rooms of his General

Practitioner friends in New Zealand and Australia, allowing his students to observe how general practice occurred internationally in real time, without any need to leave the country.

Despite the advantages that the Zoom platform conferred especially for content learning, there were limitations that Zoom is unable to overcome in clinical teaching. Students recognised how video streaming deprived them of in person hands-on activities such as the practice of physical examination skills – in particular auscultation, percussion and palpation which may be effectively taught only through an in-person encounter with actual patients. In addition, students found it difficult to observe procedures and investigations such as point of care ultrasound and minor surgical procedures. Above all, they observed the lack of “real” presence which was a barrier to expression of non-verbal communication such as the expression of empathy, and therefore the building of bonds between the doctors-to-be and patients. Many students expressed preference to be present at the clinic to observe what actually happened in the consultation room to the live-streamed platform.

Despite the restrictions of physical distancing during the COVID pandemic, the NUS Family Medicine education team innovated and provided as good a clinical learning experience as was possible given the circumstances through the use of the Zoom live-streaming platform to the students in the family medicine posting. It was an experience that stretched the faculty and drew them closer as they learnt from each other how to better provide medical training in unprecedented circumstances.

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