

The Constancy of Change – Adapting Anesthesia Medical Student Education in the time of COVID

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Abstract

2020 will always be remembered as an unprecedented year with the Coronavirus 2019 (COVID-19) pandemic creating chaos and disruption in healthcare systems worldwide and in particular that of medical education in Anaesthesiology. We share our experience of the university affiliated with the largest medical school in Singapore in mitigating the disruption on medical student education in Anaesthesiology amidst the pandemic.

In Singapore, medical education is coordinated by the Ministry of Health, medical schools and the Academy of Medicine. With COVID19, undergraduate anaesthesia education was severely disrupted. Planned training programs had to adapt to a videoconferencing platform, small group teachings or E learning modules. Alterations to assessments and training had to be implemented. Constant changes and updates became the norm, adding to the stress amongst the medical students as they continued with the pursuit of training and education.

As the world braces itself for a more virulent strain of the COVID-19 virus and the challenges of mass vaccination programs, the only constant in life is that of change. The task of educating the next generation of anesthesiologists and airway skills of doctors, likewise, needs to adapt and evolve to ensure quality and competencies of our specialty.

Key words: medical education, Covid-19

INTRODUCTION

Since January 2020, COVID-19 has infected more than 135 million people worldwide with more than 5 million lives lost worldwide as of November 2021. The pandemic has disrupted lives, overwhelming healthcare systems across the world with several nations instituting lockdown measures, social distancing, mandatory mask wearing and border controls. The pandemic is reminiscent of the severe acute respiratory syndrome (SARS) outbreak in Singapore in 2003, where 238 were infected with 33 deaths¹. On a national level, a contingency plan for dealing with pandemics has been put in place and when it became evident that COVID-19 would be a prolonged battle, these measures were immediately stepped up. A major goal was to ensure continuity of healthcare services while protecting healthcare professionals (HCPs). Non-critical administrative and training functions were halted and medical education for Anesthesiology was severely curtailed.

The first COVID-19 case in Singapore was detected on 23 January 2020, about a month after the report of a cluster of severe pneumonia cases in Wuhan,

China. By 7 February 2020, Singapore had 33 cases and the pandemic alert was raised to the highest at Disease Outbreak Response System Condition (DORSCON)-Orange. By April 2020, more clusters of new infections were found with an exponential rise in the number of infections particularly in foreign worker dormitories. The country went into lockdown mode. In June 2020, staged measures were taken to lift the nationwide lockdown, after the nationwide community-acquired infections started to steadily decline. Since then, the country has then transitioned into a period of “new normalcy”, where wearing masks and enforcing social distancing rules in the community were mandatory. Since then, large gatherings of people of more than 100 persons for social functions continue to be prohibited, however, the country is revisiting the possibility of relaxing these measures with the introduction of rapid COVID-19 test kits, and a nationwide vaccination program. As of now, in Singapore, the total number of COVID-19 cases has exceeded the 260,000 mark with 690 deaths as of November 2021².

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Training of our future Anesthesiologists at the undergraduate level is carried out on a national level with both University Medical schools, Academy of Medicine and individual department level undergraduate education directors. The implications of the COVID-19 era have brought about unique challenges in the education of our medical students. Therefore, we aim to describe our experience in the undergraduate anesthesia education of the university affiliated with the largest medical school in Singapore in the upcoming sections.

IMPACT OF COVID-19 ON MEDICAL STUDENT EDUCATION IN ANESTHESIOLOGY

The COVID-19 pandemic has undeniably affected education in all areas of medicine including anesthesia worldwide³. Anesthesiology has traditionally been a “hands-on” discipline, with heavy emphasis on practical skills such as bag-mask ventilation and airway management, which are crucial foundations to anesthetic practice and acute care management in the wards. These skills were previously heavily emphasized to students, and made a cornerstone of their curriculum, with students having to achieve minimal competency in basic airway management skills including bag mask ventilation, preoperative assessment, and exposure to cases using airway management techniques such as intubation and laryngeal mask insertion and removal, prior to their successful graduation from the 2-week anesthesia clinical posting module.

Balancing Anesthesia Education and Medical Student Safety Amidst the Pandemic

In view of the procedural nature of our practice, COVID-19 has especially impacted anesthesia medical student education in a unique way. Safety restrictions were placed by the university to prevent the risk of infection transmission to students. These restrictions included excluding all medical students from “high risk” areas including the Operating Theatre, Emergency department and Intensive Care Units. Students were therefore only allowed to undertake learning activities within the University Campus, but not allowed to enter hospitals at all for the most part of 2020, until restrictions have been gradually relaxed in the last quarter of 2020. However, as these clinical placements were held within the 4th year of the 5 year medical school undergraduate program, students who were interested were potentially able to have additional allowances to re-do an anesthesia clinical posting once restrictions were relaxed.

In addition to the above, medical student clinical postings were also spread out over 7 different hospitals in Singapore. To avoid the risk of cross-institutional infection, students were not allowed to cross over between hospitals, and required a 2 week wash out period before being allowed to participate in clinical postings in another hospital. Overseas students were also not allowed to participate in clinical electives due to global travel restrictions with the COVID-19 crisis.

The government had also placed limitations on the number of people who could gather, once the nationwide “Circuit Breaker” was lifted. This was initially limited to 5 people, and recently relaxed to 8 in the later part of 2020, and re-tightened to 2 people in June 2021. In view of this, repeated small group tutorial sessions had to be arranged to cater for the entire cohort of 300 medical students who were scheduled to rotate through the anesthesia department yearly.

Students who were interested to schedule additional face-to-face teaching sessions had to take the initiative to source for their own small group tutors to take them through tutorial sessions of less than five people, in accordance with legal requirements. This took a toll on the department manpower. In addition increased resources and tutors were required to facilitate these multiple sessions.

Transitioning to a Web-based Anesthesia E-learning Model

The government limitations placed upon medical student gathering and limitations in patient interactions meant that an alternative approach to ensure continuity of student training in the areas of acute care medicine was urgently required. Similar to our colleagues around the world, our institution transitioned to a largely internet-based and simulation-based model, with one week of in-person simulation training, small group tutorials, followed by a second week of online-based simulated anesthesiology clinical module in a virtual classroom environment⁴; as opposed to the traditional 3 days of foundational lectures and simulations followed by 6 full days of clinical exposure where students would join anesthesiologists in the operating theatre and actively participate in the clinical management of cases.

This posed multiple problems in ensuring continuity of medical education for students, as airway management was unable to be taught at all for a whole year, due to the restrictions placed by the university to preserve student safety. In addition, not being able to observe practicing anesthesiologists in the operating theatre limited the student’s ability to learn from role-modelling in the areas of patient interaction and observing non-technical skills essential to anesthetic practice. We aimed to mitigate this through using airway management mannequins during in-person simulation sessions which were used to teach students basic airway management skills such as bag-mask ventilation, intubation and laryngeal mask airway insertion. Although this would have nonetheless imparted some basic airway management skills to the students, the mannequins are unlikely to be entirely representative of real-life airway management on a patient. Furthermore, the absence of real-life patient interactions meant that students were not able to cultivate the communication and physical examination skills which are necessary in daily clinical practice⁵.

During the transition to a web-based anesthesia E-learning model, several potential technical challenges were also faced – these include inefficiency of video streaming, audio-visual connections, log-in issues, and heterogenous internet speed amongst participants which is consistent with that reported in existing literature⁶. Fortunately, despite the aforementioned limitations, the transition to online teaching was relatively seamless, as most students already had high-speed internet access, and the school had imposed log-in securities such as a mandatory password request prior to log-in for all lectures. Each student was also sponsored an I-Pad by our university on enrolment, which was put to good use during this period.

The new emphasis on web-based learning posed additional benefits to students. These include flexibility of location and hence increased convenience of attending lectures, which has similarly been reported in other settings⁷. The transition to digital learning may also aid to prepare medical students to face a world where the role of digital

health services is ever expanding. To maximise class participation in these internet-based modules, every student was required to have their video on during online teaching mediated by video-conferencing software such as Zoom. Lecturers were thus able to actively call on students to participate in various aspects of the lessons. This has been similarly reported in other centers, where online distance learning models employed during COVID involve both asynchronous components in the form of recorded videos, and synchronous components involving live interactions between staff and students⁸.

Impact on Assessment of Competency in Anesthesia

It is undisputed that worldwide, medical student examinations have been irrevocably affected by the COVID-19 pandemic, with some centres postponing or cancelling examinations entirely⁹. In our institution, acute medicine competency has traditionally been assessed via written assessments, Objective Structured Clinical Assessment (OSCE), and day-to-day assessments of Directly Observed Procedural (DOPS) such as airway management and vascular cannulation. In view of the restrictions placed upon student and patient interactions, components such as the OSCE and DOPS were unable to be included as part of the formal assessment. Instead, students were assessed using a written examination, involving multiple choice and short answer questions, leaving the practical and hands-on component entirely unassessed. In order to mitigate this, we used airway mannequins as a surrogate for assessing airway management techniques. However, we acknowledge that despite the use of high-fidelity mannequins, although students were able to obtain tactile practice and repetition necessary in the development of most procedural skills, the experienced gleaned may not be entirely reflective of the real patient airway anatomy and hence true clinical experience; this is consistent with that reported in current literature¹⁰.

Other institutions have reported deploying assessment tools such as the Open Book Examinations, in an effort to improve deep thinking, prevent rote memorization and improve analytical skills^{11,12}. While this seems highly useful in the setting of the pandemic where remote examinations may need to be conducted and it is difficult to ensure closed-book regulations are adhered to, this was not employed within our institution and may not be as relevant to the practice of anesthesia due to the heavy emphasis on hands-on procedural skills. Future work should be considered to evaluate the usefulness of such innovations within the practice of anesthesia.

These implications are especially relevant to the assessment of competency in anesthesia, where adequate hands-on skills are vital to ensuring safe and competent clinical practice, as they transition to becoming a new doctor.

CONCLUSION

In summary, COVID-19 has brought about an unprecedented era of change in education and training within anesthesia undergraduate education. It has challenged the foundations of clinical medical education, urging for boundaries to be pushed, with the exploration

of new techniques and modalities of continuing education amongst future doctors. However, despite these efforts, a training gap in hands on patient experience, soft skills and patient interaction skills may still be inevitable, and may impact upon their practice as future doctors. Further study is needed to evaluate the impact of these new modalities on student performance, clinical aptitude and ultimately, recruitment into the specialty due to the paucity of clinical exposure. With the current relapsing and remitting nature of COVID-19 and the emergence of new variants, consistent efforts need to be underway to ensure the sustained delivery of quality medical education, while maintaining the safety of staff and students. Given the phased reopening of our community and scaling back on safe distancing measures, we are optimistic that in-person clinical education and patient experience amongst students will be able to continue, albeit at a scaled back capacity compared with the pre-pandemic era. Our experience has demonstrated that adaptability and innovation are to ensure education is continually sustained in a world where change is the only constant.

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