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Delivering medical education amidst COVID-19: Responding to change during a time of crisis

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I. INTRODUCTION

The Coronavirus Disease (COVID-19) pandemic caused by the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) virus has led to significant disruptions globally with alarming mortality rates and increasing economic burden. For the medical community, aside from massive changes in workflow, healthcare worker fatigue and direct risk of infection, COVID-19 has also resulted in significant disruptions to medical training. During a pandemic, it is not surprising that manpower, financial resources and time are allocated fully to contain the disease. We believe however, that structured teaching activities amidst this crisis play an important, if not pivotal role, in keeping the medical community united and informed of the rapidly changing evidence surrounding this disease. Our department instituted measures to ensure that disruptions to post-graduate training were minimised amidst the clinical workflow changes. In this article, we share our experience of how teaching activities were sustained through implementing various strategies. We also discuss the benefits derived from ongoing teaching during this pandemic.

II. EXECUTION AND EXPERIENCE

When Singapore first announced the escalation of the Disease Outbreak Response System Condition (DORSCON) alert level from yellow to orange in response to increasing community spread of COVID-19, all healthcare institutions immediately put in place protocols and workflow to cope with the demands of COVID-19 (A Singapore Government Agency Website, 2020). Our department, a paediatric department in a university hospital, followed suit with plans for team segregation and clinical workflow protocols for children with respiratory illnesses. At the same time, all face-to-face teaching activities and meetings were suspended, in an attempt to minimise gatherings of clinicians.

The Residency Programme Director quickly formed a dedicated Education Task Force (ETF) to look into adapting the post-graduate teaching activities to take into account clinical service needs, as well as team segregation. Prior to the pandemic, our post-graduate teaching (in additional to clinical learning on the job) were largely based on face-to-face large group sessions, as well as small group clinical bedside teaching. As the department adjusted to the new COVID-19 clinical workflow, the ETF effectively morphed the delivery of post-graduate education to cater to the education needs of residents and faculty.

Our teaching sessions have been transformed from in-person to on-line delivery via the Zoom video-conferencing platform. This has allowed residents (interns, medical officers, senior residents) from different clinical locations, who are not allowed to meet physically, to attend. An added benefit is that residents off-site may also choose to attend these teaching

activities. In addition, faculty members who would previously not attend resident teaching have also been able to attend these sessions and collectively contribute to the teaching and learning process. We have been able to conduct almost all our continued medical education (CME) programmes via video-conferencing; journal clubs, mortality rounds, radiology rounds, topic reviews, history taking sessions, case-based discussions and importantly, COVID-19 clinical workflow updates.

The ETF outlined ground rules for the on-line teaching sessions at the outset: participants have to sign in with appropriate identification, unmute microphones only when speaking and respect the confidentiality of teaching materials without taking pictures or recordings unless explicit permission is obtained. In order to ensure the security of these video-conferencing sessions, each session is managed by a host, with controlled admission of participants.

A. Modified Clinical Teaching

During this pandemic, we have been able to continue clinical history-taking teaching sessions for residents with real patients via video-conferencing. In this format, one resident in the "hot-seat" takes the history from the patient remotely, while other participants observe the encounter via a live video stream from different locations. This "live" history-taking session is followed by a discussion between the resident and faculty on the patient's clinical history as well as management. Other residents are also able to participate in the discussion. We have been extremely encouraged by the responses from patients and their families who have readily consented to these video-streaming teaching sessions. Our experience has reinforced the notion that patients are willing to participate in medical education as a means to give back to the medical community (Stacy & Spencer, 1999; Thomas et al., 1999). In a time of crisis like this, where the medical community has to quickly learn and rapidly adapt to new discoveries of COVID-19, the role of patient involvement in teaching and research cannot be better overstated.

B. Specific Mock Code Training

Aside from core teaching sessions for residents, the department quickly recognized the importance for on-the-go pandemic-preparedness training for the residents. Faculty from the critical care division has developed COVID-19 relevant mock code scenarios for residents using high fidelity simulation equipment. These sessions are conducted during designated time slots and adhere to the team segregation plans. The scenarios involve the use of powered air-purifying respirator (PAPR) equipment and personal protective equipment (PPE). Residents are given the opportunity to perform the initial clinical assessment, cardio-pulmonary resuscitation and intubation, as well as communicate with the rest of the clinical team whilst dealing with mock patient emergencies in negative-pressure isolation facilities. Many of the junior doctors as well as nurses quickly realized the added challenge of performing seemingly standard resuscitation in isolation facilities whilst in full PPE. Routine tasks such as communication between team members, preparation of drugs, use of resuscitation drug charts and even mobile phones while wearing PAPR and PPE can be extremely difficult. These simulation sessions highlighted to us that good planning, coordination and communication between healthcare workers are all the more crucial while resuscitating in a COVID-19 setting.

C. Increase Trainee Participation

An initial unanticipated benefit of this style of teaching and learning was increased trainee participation in these sessions. We noticed that a proportion of residents who would otherwise have remained silent in an open group teaching encounter were now more willing to ask and answer questions, either through their voice audio or using the chat function of the Zoom platform. What is most interesting is that when we compared our teaching attendance rates for residents at these video-conferencing CME compared to the usual face-to-face teaching, there was an increase from an average of 32% (pre-COVID-19) to 68% (during COVID-19) in daily attendance rates. This increase attendance was seen for both COVID-19 and non-COVID-19 related teaching sessions, suggesting that it was not only the COVID-19 updates that drew participation for these sessions. Contributing factors could include the ease of access afforded by learning from various (remote) locations, particularly for residents posted off-site who are unable to travel back. In addition, the Zoom video-conferencing tool is readily available on a variety of platforms, including laptops, tablets and mobile phones.

D. Limitations and Challenges

The main issue raised had been that of internet connectivity in certain areas around the hospital, but this has been rectified with specific locations allocated as "teaching hubs".

Another shortcoming of the on-line teaching programme is that bedside teaching for clinical skills has not been possible, in the interest of staff and patient safety. The ETF has since explored other innovative approaches; using video clips of clinical signs, as well as preparing pre-taped clinical examination signs with patient and caregiver consent.

III. THE RECIPE TO SUCCESS

The feedback received from residents for this on-line delivered teaching has been extremely positive, with 42 of 46 residents rating it positively on a feedback survey. Many of our residents look forward to attending these sessions, not only as a means to learn, but also as an opportunity to connect with fellow colleagues.

We believe that our success in maintaining a relevant teaching programme during the COVID-19 pandemic is attributed also to the following factors:

· Strong teaching culture with a mission of ensuring that residents are appropriately trained.

· Faculty realising the importance of pandemic-preparedness training for residents.

· The ability to innovate and the flexibility to adjust the delivery of medical education to meet the needs of the current pandemic situation.

· The availability of reliable resources and use of latest educational technology such as the Zoom Video-Conferencing to allow delivery of web-based teaching.

IV. CONCLUSION

As our health workers continue to brave the frontline battling against COVID-19, we are frequently reminded of the importance that flexibility and adaptability is crucial during this pandemic. While we continue to deliver the best possible patient-centred care and ensure the safety of our healthcare workers amidst this COVID-19 pandemic, structured teaching in our department continues to be an important part of our daily routine. We experienced first-hand the benefits of web-based learning and would retain some of these sessions post-pandemic. The deliberate strategies taken by our department to ensure that teaching activities continue has allowed learning to persist in a structured and relevant way. Importantly, on-the-go training for pandemic-preparedness for residents is a highly valuable skill to teach during this time. We are very proud to be able to continue to learn and keep abreast the latest developments on COVID-19 as a department. As former United States First Lady, Abigail Adams so eloquently said, “Learning is not attained by chance, it must be sought for with ardour and attended to with diligence”.

Notes on Contributors

Ng Nicholas Beng Hui contributed in design, analysis and interpretation of data, drafting the article, and final approval of the version to be published. Chiong Terri contributed in analysis and interpretation of data, revising it critically for important intellectual content, and final approval of the version to be published. Lau Perry Yew Weng contributed in conception and design, and interpretation of data, revising it critically for important intellectual content, and final approval of the version to be published. Aw Marion M contributed in conception and design, and interpretation of data, revising it critically for important intellectual content, and final approval of the version to be published.

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Declaration of Interest

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