DOI: https://doi.org/10.5114/ait.2020.101360

Postgraduate education and specialty training in anaesthesia and intensive care medicine during the COVID-19 pandemic: experience from a large teaching hospital in the United Kingdom

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Anaesthesiol Intensive Ther 2020; 52, 5: 434–437

Dear Editor,

The COVID-19 pandemic has affected all aspects of life, particularly in the health care sector. Initially, the focus of organizations was to ensure the safety of the public and the continuous provision of health services [1]. As such, other aspects of healthcare which were not directly related to the management of the pandemic, such as specialty training or post-graduate education, were limited or postponed. Many medical congresses and conferences were similarly delayed or transitioned to a virtual platform. However, as soon as it became clear that the pandemic was far from over, it was crucial to restore long-term medical training and education as a priority [2, 3].

In this correspondence, we describe the steps taken by the Department of Anaesthesia and Intensive Care Medicine at the Queen Elizabeth Hospital Birmingham, one of the largest post-graduate training centres in the United Kingdom. Training in anaesthesia and intensive care medicine (ICM) in the United Kingdom share a common pathway during core training years. After attaining core competencies, the training pathways diverge. At the end of the required period of speciality training, a certificate of completion of training and specialist registration in the respective field of either anaesthesia or ICM is obtained. However, a number of trainees pursue training pathways in both anaesthesia and ICM and are awarded dual certification.

Due to this training structure, we have two departmental subdivisions responsible for post-graduate education; one for anaesthesia and the other for ICM. The two subdivisions work autonomously although they are closely aligned. This structure is necessary in view of the sheer number of trainee doctors in our Department; we have more than 50 doctors in our programmes of specialty training and a similar number of trainees on rotations from other branches of medicine. Furthermore, the department employs over 100 doctors who have completed specialist training (consultants) in anaesthesia, intensive care or indeed both of these specialities.

Our Intensive Care Unit education group is responsible for providing training and continuous post-graduate education to the following groups of doctors:

- Foundation Years doctors (Postgraduate interns),
- Trainee doctors (Residents) in anaesthesia who have chosen a single path of specialisation,
- Trainee doctors (Residents) in intensive care medicine who have chosen both a single or combined pathway with another primary discipline (such

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as anaesthesia or general internal medicine),
- Trainee doctors (Residents) in general internal medicine, emergency medicine, surgery or respiratory medicine during their rotations in ICM,
- Fellows (pre-Consultant doctors), many of them coming from abroad to gain additional specialist experience,
- Senior Specialists (Consultants) permanently employed in the Department.

Each of these groups clearly has different educational needs. The youngest doctors need a basic introduction to ICM whereas more senior trainees need to focus on attaining required competencies and preparing for speciality exams. Consultants need to obtain enough educational points to successfully complete a five-year revalidation cycle and maintain a license to practice.

The ongoing pandemic has forced significant changes to our current educational programmes and structures. These changes were necessary due to the increasing numbers of COVID-19 infections particularly affecting our younger colleagues in the under-30 age group at the time of writing (late Summer/Autumn 2020). Interestingly, epidemiological studies carried out at our hospital showed that the percentage of seroconversion during the first wave of COVID-19 among employees of the intensive care unit was limited to less than 15% of those tested and was, therefore, relatively low [4].

It became apparent that due to the rules of social distancing, our daily face to face educational meetings in a crowded seminar room were no longer feasible. Initial attempts to provide teaching entirely virtually were insufficient and were not highly rated by our team. Another issue was ensuring the protection of patient data when discussing cases during virtual meetings. We learnt quickly that robust protection was needed against unauthorised logging in of anonymous participants. All these challenges required close co-operation between our administrative department and the clinicians responsible for post-graduate teaching (Table 1).

One of the crucial decisions needing to be made was choosing which virtual platform to use. Initially, we used the Zoom platform (Zoom Video Communications, Inc., San Jose, California, United States), especially since the 40-minute session limit was removed for educational purposes. However, since then NHS Digital and NHSX (organizations coordinating the safe implementation of digital platforms in UK healthcare) issued guidelines recommending Microsoft Teams (Microsoft Corporation, Redmond, Washington, United States) as the preferred platform for a multitude of reasons, including strengthened security and economic benefits. For this reason, we moved across to using this particular program, rather than because of the superiority of one program over another in relation to everyday educational activities. Research meetings under the auspices of the University of Birmingham are still being held on the Zoom platform, based on internal university regulations [5].

A key aspect in co-ordinating educational activities during this time was the early involvement of the established trainee committee in our Department. Joint decision making and continuous feedback regarding the use of new technologies allowed resolution of many technical and logistical problems created by new virtual ways of delivering teaching. Despite this co-ordinated approach to management, we often still had to make ad hoc changes to both meeting platforms and to hardware like computers and peripheral devices. Without the full engagement of our younger colleagues such a flexible approach would simply not have been feasible.

At the end of April 2020, we resumed our weekly clinical governance meetings, at which departmental mortality and morbidity is discussed. After the first trials, it became clear that the best model would be the hybrid one, with participation of a small, socially distanced group face to face with the rest of the department taking part in the meeting virtually. It turned out that this type of clinical activity actually required much more personal involvement and time with the presence of a dedicated moderator, responsible for technical aspects and management of virtual participation in the discussion. To avoid unauthorised participation, all attendees were asked to log in via their trust e-mail addresses to prevent any breach of confidentiality related to discussion of patient details.

Based on the stipulations of Health Education England, all trainee doctors require annual review of competency progression (ARCP) by a Regional Training Committee led by a Training Programme Director. The preparation of necessary documentation for ARCP reports is the responsibility of the trainees but the process itself is supervised and monitored by the Departmental Education Lead. Unfortunately, the end of the academic year overlapped with the peak of COVID-19 admissions to the intensive care unit. However, thanks to the immense help of all educational and clinical supervisors and, of course, the trainees themselves, all the junior doctors in our unit successfully achieved the required outcomes for progression at the end of academic year 2019/2020. This was despite our hospital's intensive care unit being one of the most heavily burdened units in Europe, treating more than 200 patients affected by Covid-19 by August 2020 [6].

The start of the new academic year in August brought new challenges in terms of the provision of our month-long in-house Introduction to Intensive Care Course. Before the outbreak of the pandemic, the course consisted of daily seminars covering all key topics in our specialty. In the autumn semester we switched to a hybrid model, with obvious limitations due to the self-isolation of some lecturers or participants. Again, considerable flexibility was needed to accommodate switching from a hybrid model to a completely virtual one, when this was required. Despite these limitations and frequent changes, the participants' have so far given positive feedback. As previously reported, participants prefer live lectures in a hybrid model rather than

TABLE 1. COVID-19 educational challenges and solutions

Challenges	Solutions
The lack of a physical space to provide education in one area while adhering to guidance on social-distancing	HD video conferencing equipment and large monitors purchased and installed in seminar rooms to broadcast sessions for those who were on-site in the hospital
	Microsoft Teams® software access purchased to broadcast sessions for those who were both on- and off-site
Balancing the need for service provision with the need to train staff and fulfil educational commitments	Promoting already existing strong culture to encourage the attendance at the educational meetings Recognition by nursing staff the necessity for education and awareness of the times when staff may be in meetings Ensuring methods of contact are clearly signposted in the event of an emergency
	Educational attendance strongly encouraged and supported by the consultant body Issues arising with ability to attend educational meetings highlighted in the monthly Junior Doctors' Forum and escalated to the responsible officers
	Working day structured to allow completion of tasks in an expedient manner ensuring adequate time available for educational opportunities in the afternoon
Ensuring adequate provision of educational meetings and speakers in busy COVID times	The Trainee Education Lead being a trainee ICM physician with responsibility for co-ordinating educational activities
	Encouraging staff to give education via Microsoft Teams® when they are not available to deliver on-site
Encouraging teaching attendance	Attendance being monitored in exchange for internal CPD credits
	A weekly schedule emailed in advance
	Reinforcing the culture where attendance at meetings both expected and encouraged

pre-recorded presentations, since the former allows active participation with question-and-answer sessions at the end of the meeting. Due to a very intense rota not all junior doctors could attend all lectures [7]. Therefore, most of the course material was also available electronically after the lectures had been given.

The oral specialty examinations (viva and OSCE) in Intensive Care Medicine, are now held online, rather than face to face in London, as was previously the case. To navigate this new format, we met with our trainee candidates to discuss how their exam preparation was going and to allow us to understand what assistance they required from us as trainers. In the immediate run-up to the examination, we conducted several mock examinations online preparing our candidates for new, potentially more stressful conditions of examinations in the virtual world [8].

In recent weeks, we are the first teaching hospital in our region, to have managed to fully restore our educational programme. We have resumed weekly lectures by invited internal and external experts, both in our discipline and in related fields. Previously, we were fortunate to have invited many external experts from leading centres worldwide, which would not now be possible.

We have restarted our ever-popular departmental journal club in hybrid form, where lively discussions of the most current medical articles happen. Previously, the club's schedule included weekly, 45-minute face to face meetings, during which trainee doctors had an opportunity to deliver structured presentation of a selected article, followed by discussion on the clinical and methodological aspects of the publication. This program has always been very highly rated by our trainees in local and national feedback. It also allows our trainees to fulfil obligations of an annual public presentation, as required by their curricula. The current feedback regarding the hybrid meeting style is of the same positive nature as it was previously for the face-to-face schedule.

It should be emphasized that the resumption of educational activities would not have been possible without the help of many colleagues and the continuous involvement of our administrative and information technology department. The resumption of education required frequent reconfiguration of already owned equipment, new purchases, and continuous logistic support, for which we are all very grateful. Thanks to these joint actions, sometimes planned in advance, but most often based on improvisation, we were able to restore postgraduate training to a similar level as before the pandemic, although of course not without unexpected difficult moments.

Based on our experience we have drawn some conclusions and plans for the future. Recent months have shown that conducting postgraduate education during a pandemic requires much more team spirit, time commitment, flexibility and openness to meet new and unexpected challenges. Even well-planned programs that existed prior to the outbreak of the COVID-19 pandemic needed significant changes to allow them to be implemented in a socially distanced environment. Most of the participants and lecturers prefer the mixed hybrid model rather than a purely virtual one for the lectures and seminars. This model, at least from our perspective, increases

the involvement of participants and ability to attend both on and off site. We hope that this model will remain our main way of providing our educational programme even after the pandemic has passed.

The full involvement of trainees in the decision-making and organisation of educational activities allowed for better adaptation to their expectations and needs. It also enabled diversity to be maintained in relation to the educational package, similar to that prior to the pandemic. Based on the planned schedule and the current organisation of clinical work during the second wave of the pandemic, we envisage that we should be able to maintain the current educational programme throughout the 2020/2021 academic year. This model will allow us to also involve colleagues who are in self-isolation in both receiving and delivering remote classes and lectures.

The Queen Elizabeth University Hospital Birmingham intensive care education team:

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- Dr. Randeep Kaur Mullhi, Intensive Care Education Deputy Lead & Deputy Faculty Tutor,
- Dr. Dhruv Parekh, Intensive Care Education Deputy Lead & Deputy Faculty Tutor.

Trainee Doctors' Committee:

- Dr. Ranjna Basra, Chairperson and Trainee Service Lead,
- Dr. Alexander Midgley-Hunt, Trainee Governance Lead,
- Dr. Martin O'Connell/Dr. Muzzammil Ali, Trainee Education Lead – Spring semester/Fall semester 2020.

ACKNOWLEDGEMENTS

1. The authors would like to thank the COVID-19 ICU Tactical Group and the whole group of Intensive Care consultants for their logistical support, constant optimism and creative approach to solving problems and all the other colleagues in our department for working together in the extremely difficult conditions of the pandemic.
2. Financial and sponsorship support: there are no external sources of project financing
3. Conflict of interest. None of the authors declare a conflict of interest related to this article.

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