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Editorial

Education and scientific dissemination during the COVID-19 pandemic

W. J. Fawcett,[1] **M. Charlesworth**,[2] **T. M. Cook**[3] and **A. A. Klein**[4]

1 Consultant, Department of Anaesthesia, Royal Surrey County Hospital NHS Foundation Trust, Guildford, UK
2 Consultant, Department of Cardiothoracic Anaesthesia, Intensive Care and ECMO, Wythenshawe Hospital, Manchester, UK
3 Consultant, Department of Anaesthesia and Intensive Care, Royal United Hospitals, Bath, UK
4 Consultant, Department of Anaesthesia and Intensive Care, Royal Papworth Hospital, Cambridge, UK

Correspondence to: M. Charlesworth
Email: editor-charlesworth@anaesthetists.org
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Twitter: @billfawcett; @miko_charleswor; @doctimcook; @Anaes_Journal

The COVID-19 pandemic has produced unique challenges for society in general and healthcare workers in particular. For intensivists and anaesthetists, the clinical workload has been incomparable, with multiple challenges for those providing frontline care. This has included staffing dramatically expanded intensive care units, redeployment, cross-skilling and embracing new ways of working. It has also included involvement in many less high profile roles, such as hospital logistics planning, risk management and supply chain management to ensure critical care and emergency anaesthesia and surgery have space, staff, systems and equipment. These many new ways of working have necessitated numerous staff taking on new or long-forgotten roles and have created a need for focused, up to date teaching and training. This editorial outlines how education and scientific dissemination at the Association of Anaesthetists has continued throughout the pandemic, as well as exploring likely future directions for such activities.

The provision of timely medical education has been crucial in supporting the delivery of high-quality, evidenced-based, uniform care. Although many of the principles of managing and supporting patients with severe viral pneumonitis and subsequent multi-organ dysfunction are well known and widely practised, COVID-19 – unknown before December 2019 – has been a disease of unexpected, unique complexity, and both this and the pandemic response led to evolving clinical information and experiences, all of which have needed rapid dissemination to clinicians managing patients at the heart of the pandemic.

Globally, we have witnessed many countries practising social distancing and, in some cases, total lockdown. This has led to cancellation of all face-to-face meetings – including medical meetings inside and outside hospitals – and in many cases suspension of printing and distribution of medical journals. To add to this, many hospitals have cancelled or revoked most non-clinical activities, such as study leave, and reduced or abolished supporting professional activity time in order to focus on delivering frontline care. Those engaged in clinical research, in many cases, have also had to suspend their activities to deliver clinical care. The overall result has been a dramatic increase in the requirement for medical knowledge and yet the principal methods – meetings and reading journals – have been, in many cases, completely interrupted.

e-Learning

There are many different e-learning formats available, from webinars and webcasts to asynchronous learning management systems (e.g. Moodle). The Association of Anaesthetists has been increasing its online education through 'Learn@' (https://learnatanaesthetists.org) which enables, for example, delegates to watch lectures from national conferences again, and online tutorials on topics such as transthoracic echocardiography.

Webinars (web-based seminars) are a very common method of delivering education, and emerging evidence suggests they are as effective, if not more so, than asynchronous learning management systems and offline face-to-face classroom instruction [1]. They have the facility for interaction with speakers, akin to asking questions after a lecture. The rise in popularity of webinars has been supported by several drivers, including: to reduce the environmental impact of meetings; to help address dwindling study leave budgets; to choose a time for maximum attendance; and to improve ease of access to education. Webinars can be accessed by any internet-enabled device including laptops, tablets and smartphones.

Before the COVID-19 pandemic, the Association's webinars were usually provided for a small charge to members and a greater charge to non-members. The exception was a small number of webinars sponsored by medical companies and provided free to all. Once it was clear that the outbreak of the pandemic would soon prevent all face-to-face meetings, the Association decided to place all its educational offerings online and introduced a series of COVID-19 webinars, which were provided free to members and non-members alike. Indeed, the first such webinar was broadcast within a week of lockdown and was very popular: it was over-subscribed and subsequently viewed by more than 29,000 individuals from 85 countries.

Compared with previous webinars, the COVID-19 webinars have been better attended, both live and more so for those watching the recorded event at a later time (Table 1). Global reach has been extraordinary, with worldwide engagement. Feedback from the meetings helped to inform and guide further webinars. The chosen time was on a Saturday morning (UK time). This consistently proved to be very popular, with approximately 70–80% of delegates preferring this time, with 15–30% preferring a weekday evening and very little support for an 'in-hours' webinar (1–3%). Generally, approximately 95% of people accessed the meeting whilst at home, with very few delegates accessing content while 'out and about' or at work. The quality of connection to the webinars appeared satisfactory with 45–60% rating it as excellent and 25–40% as good. Fair or poor connections were consistently less than 5–7%. There has been great enthusiasm for these webinars, from both online feedback afterwards, as well as social media, especially Twitter. Overall, these 10 webinars appeared to provide hugely popular, high-quality education at a time of great need which was rated highly both in the UK and abroad, with approximately 48,000 total recordings viewed to date.

Scientific publications

At the same time as the COVID-19 webinars started in early March 2020, the journal *Anaesthesia* decided to increase its offerings. It was clear that all healthcare professionals were looking for high-quality, fact-checked information from a trusted source, and this demand far outstripped supply. The first response was to publish blogs from guest authors (https://theanaesthesia.blog), and the first blog concentrated on what doctors in anaesthesia and intensive care medicine should think about and do next. This introduced concepts such as the reproduction number (R0), risk factors, case fatality rate and the likely impact on UK healthcare systems [2]. This blog post was read > 60,000 times, with most clicks from the UK, but also with many readers from the USA, Australia, Canada, Ireland, South Africa, Finland, Spain, India, Germany and elsewhere. This was a strong signal of the need to publish high quality content quickly, as the usual lead time of 6 weeks from submission to publication would mean that such a piece would be out of date well before publication.

With much early attention on the response in Italy, the first COVID-19 journal publication was written by a group of Italian authors documenting their experiences of caring for patients with COVID-19 [3]. At the same time, the journal agreed to fast-track peer review for COVID-19 related submissions, with a target of 48 h instead of the usual two weeks, from submission to decision. Other journals published COVID-19 literature without peer review, but *Anaesthesia* decided to continue with its full peer review process. It also introduced a new facility, 'Accepted Articles', where manuscripts were published online in their final accepted form before typesetting. This enabled many COVID-19 related publications to be peer reviewed and published in 72 h, similar to preprint servers but with the

Table 1 Details of webinars hosted by the Association of Anaesthetists since 2017.

	Number of webinars	Bookings per webinar (mean)	Attendees per webinar (mean)	Recording views per webinar (mean)	Delegate countries
Subscribed webinars	12	62	32	118	35
Sponsored webinars	3	747	266	867	50
COVID-19 webinars	10	848	489	4761	85

advantage of full peer review. In addition, all COVID-19 publications were made free to access for all. Key messages from influential papers were, therefore, immediately available to everyone. Consensus guidelines (which hitherto take several years to develop) for airway management of the patient with COVID-19 were delivered to the anaesthetic and intensive care community within barely two weeks between inception to publication [4]. These guidelines were viewed more than 500,000 times in the first month after release. The final change was that accepted correspondence was also published online immediately after acceptance, instead of waiting for it to be included in an issue. This allowed published material to be set in the appropriate context and, where necessary, challenged.

Ensuring the same level of quality and rigour did not come without challenge, and the Editors found new ways to streamline the process, including speaking directly with authors to answer points raised in the review process, enabling changes to be quick and efficacious. We also relied on a bank of external reviewers with a strong track record. We hope our editorial practices during the pandemic elevated the quality and trustworthiness of our content, which are of increasing importance given the growing number of COVID-19 related retractions from high profile publishers (https://retractionwatch.com/retracted-coronavirus-covid-19-papers). The increase in submissions has been remarkable, and the total number of submissions has doubled since the beginning of the pandemic. For example, 185 manuscripts were submitted during the month of April 2020, compared with 81 submissions during April 2019.

The May, June and July issues were not printed because of issues with capacity at the printers and with distribution networks. Twitter has remained as useful as ever to communicate key messages from published papers [5]. During the 82-day period from 1 March to 21 May 2020, journal Tweets generated approximately 1.2 million impressions, approximately 21,000 link clicks, 3000 retweets and 4500 likes. The most popular tweets were in relation to the first COVID-19 blog post from early March [2], the early paper from Italy [4], and consensus airway guidelines [4]. Infographics remain a useful way to provide readers with usable and sharable content. A new addition to the armamentarium is podcasts. Each month, we interview the authors of a paper and the recording is then free to download (https://onlinelibrary.wiley.com/journal/13652044/podcasts). The most recent podcast discusses many complicated issues around personal protective equipment, which is understandably an incredibly important and emotive topic for all healthcare workers [6].

Looking forward, we anticipate several changes to operations for the journal. First, most healthcare organisations were able to escalate quickly and effectively, and clinicians have made enormous modifications to all areas of clinical practice. De-escalating is likely to be more challenging, and although we might seem a long way from 'business as usual', we anticipate a shift in focus in the literature towards how organisations can provide some 'normal business'. Second, we will continue to invite authors to write for our blog and express their opinions on key topics. Third, social media platforms enable us to disseminate information to readers, but they also help us identify key topics or areas of controversy before they hit the headlines. We hope we have continued to be a leader in integrating social media with the traditional journal publication model, and that we can reach people where they are. We continue to list the Twitter handles of our authors on papers and create eye-catching infographics, which are disseminated on multiple platforms. The conversation is bidirectional, as Twitter helps disseminate published papers to increase their reach, but it also allows us to monitor and engage in conversations to help identify the key topics of interest that our readers want addressed. For example, we often invite reviews from authors after seeing their thoughts articulated in a Tweet [7]. Finally, we have hopefully shown that we can maintain our high standards whilst at the same time providing authors with a fast-tracked, personal and friendly service. The challenge now is for us to think about how we can adapt further so we can continue to provide contemporary content that is clinically-relevant, usable and accessible.

The future

The COVID-19 pandemic will result in permanent change for many aspects of our lives; our education and scientific publications are no exception. Many will feel there is still a need for face-to face meetings and paper journals, whereas others will say that alternative means can provide high-quality education, at a lower cost and with a reduced environmental impact. However, this must be taken alongside changes in educational philosophy, such as active rather than passive learning. Moreover, there are aspects of meetings that are hard to quantify, such as: social interaction and well-being; presentation and discussion of research; hands-on teaching; and the opportunity to travel and visit venues, often incorporating some family downtime before or after the meeting. The concept of hybrid meetings is one way to combine the benefits of face-to-face and virtual meetings [8]. For the time-being, we are forced to deliver education in a new way, but it has given us all an

appetite to weave the benefits of some of these enforced changes into the educational fabric we offer.

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