Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Editorial

Radiology training. What good looks like, now and in the future

The COVID-19 pandemic has had a significant impact on the delivery of radiology training.[1–3] Following the national lockdown, much of the traditional face-to-face training and assessment ceased and indeed many trainees were redeployed to other clinical areas.[4] Radiology training centres across the country had to adapt rapidly to provide teaching and training using remote platforms,[4] and the fact that this was achieved under the most challenging of circumstances, shows the determination and dedication of these training programmes. Hospital IT teams have been very accommodating, with remote platforms being widely introduced for much of hospital practice. This has meant that the disruption to training provision was less than it otherwise would have been. Although it has taken some time for trainers and trainees to develop the new skills required and to feel comfortable interacting virtually, this method of training has generally proved functionally effective.

With lockdown restrictions having eased and our personal and professional lives adapting to living with the virus, face-to-face teaching and training has returned; however, the period of extensive online training access provides an opportunity to evaluate the two different learning formats, with both having their advantages and disadvantages. Clearly, we must combine the best of the traditional and newer methods to optimise the provision of radiology training. This will enable improvement in the quality of training and the training experience with the intention of improving patient care and the patient experience.

In order to address this, the Royal College of Radiologists (RCR) created a short-life working group comprising radiology training leads and trainees. As well as bringing their own views and experiences and discussing the relative merits of face-to-face and virtual training methods, this group sought the opinions of UK heads of radiology training and trainees through the RCR Junior Radiologists Forum with a questionnaire exploring the innovations developed during the pandemic. This enabled the identification of those methods that were felt to be most likely to warrant broader use and acceptance as well as some areas of training practice that could and perhaps should now be replaced. The full report, “Radiology training: what good looks like now and in the future”, with recommendations for how the future can be realised, is available on the RCR website.[5]

The principal benefit of remote platforms is accessibility.[2,4] Trainees from different hospitals in a region can join the same teaching session and can access the teaching later from home where this has been recorded. The provision of regional teaching has long been a challenge with special interest expertise varying in different centres across the country but virtual online platforms now enable the sharing of individual teaching sessions or teaching days to geographically remote regions. The increasing and widespread use of webinars, including the RCR trainee webinar programme,[4] helped to achieve this throughout the pandemic, and these are likely to continue, while the innovative online resources, such as those on the RCR learning hub, will continue to be developed. Diagnostic imaging training also proved to be effective remotely, and some centres are developing simulated reporting to support this.[6] Rad rounds, virtual case of the week and virtual multidisciplinary team (MDT) meetings have been established and will likely continue and become a central component of future training.

Remote platforms will have an increasing role in current and future training provision, but they are not the whole answer. Face-to-face training is felt to be better for fostering team spirit and rapport, as well as enabling the critical development of clinical departmental and team leadership skills.[7,8] Learning how to interact effectively with other members of the imaging department team and with referring clinical teams is a crucial part of clinical radiology training and is best achieved by regular presence in the department. Impromptu discussions that arise from the informal training atmosphere achieved face to face is difficult to recreate online and trainers continue to find it easier to assess a trainee’s strengths and

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weaknesses and provide feedback in person than on a computer screen. Teasing out the finer points of understanding in-person has been described as 'the nuance of training' and often provides a subtle means of imparting crucial learning points to enable a trainee to understand, learn, and develop.

Where face-to-face training remains crucial is in procedural training, such as ultrasound, fluoroscopy, and interventional radiology.[2] These clearly require patient contact and involve training in explaining procedures to patients, the consent process, procedural technical skills, patient after-care and the management of post-procedure complications. This area of training was consequently significantly impacted during lockdown,[4] as no remote training method could substitute for direct patient contact. Some innovative training methods are being developed with simulators and various forms of virtual and augmented reality[9]; some interventional radiologists have filmed their procedures with the patient's consent for remote or later viewing. Although these techniques will be useful training adjuncts in future, particularly with increasing numbers of trainees needing access to comprehensive IR training, they will not replace significant procedural hands-on experience or the importance of patient interactions.

At a time of significant change in UK radiology training, with the rapid expansion of imaging academies and increasing training numbers, it has never been more important for us to evaluate and optimise the quality of the training we provide. The pandemic has inadvertently kick-started a major change in the way we deliver training and it is vital we build on this by using these new methods to share our knowledge, resources, and teaching sessions more widely. It seems likely that there will need to be a blend of remote and in-person learning, but that more teaching will be virtual while much of the broader procedural training will remain face to face.[8] Diagnostic imaging training still probably needs to be largely in person but could be increasingly remotely supervised for more senior trainees. We have a clearer concept of what future technology-enhanced radiology training will look like, led by the incredible innovation of our training community, and while this will continue to need investment, it is likely we will get there sooner than we thought. The future is bright and is almost here.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

A. Rajesh is on the editorial board of the journal and is the in-coming journal editor

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