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# Surgical training during the COVID-19 pandemic: preparing for future uncertainty

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## Abstract

The COVID-19 pandemic has brought unprecedented changes in healthcare and surgical training, with elective operating reduced or stopped, conferences rearranged and examinations cancelled. Trainees and trainers have adapted, creating innovative and resourceful ways to continue learning, enabling progression through surgical training. With rising COVID-19 cases across the world and further waves of infections likely, we reflect on recent changes to surgical training and discuss how best to support the next generation of surgeons during this period of uncertainty.

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## Unprecedented change

March 11 2020, the date the World Health Organization declared COVID-19 a pandemic, will go down in history. Within days surgical training had changed beyond recognition, with elective services suspended to maximise critical care and hospital capacity.<sup>1,2</sup> Teaching events were cancelled and many trainees were redeployed to other hospital areas such as Intensive Care Units (ICU).<sup>3,4</sup> Surgical organisations worked tirelessly to issue and update guidance for the prioritisation of services, safe practice and the use of

personal protective equipment (PPE).<sup>5–7</sup> Training bodies adjusted recruitment, appraisal, licensing and certification processes to the changing situation and to maintain career progression.<sup>8,9</sup> Additionally, postgraduate medical examinations were cancelled to mobilise clinicians for clinical duties and to reduce the risk of viral transmission between groups of trainees.<sup>10,11</sup>

The General Medical Council (GMC) in the United Kingdom encouraged clinicians to be flexible and work intelligently,<sup>12</sup> which fostered innovation. Trainees and trainers adapted to the new working environment to create novel learning opportunities. With continually rising COVID-19 cases we reflect on changes seen in surgical training since March 2020 that should remain as we continue to adapt to this pandemic.

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## Teaching

Traditional teaching has been disrupted by social distancing requirements preventing the congregation of trainees. Increased use of telecommunication and video conferencing software has led to novel teaching methods including virtual/online teaching programmes.<sup>13,14</sup> Online video peer-to-peer teaching has become increasingly popular allowing far more delegates than would have traditionally been able to attend in person.<sup>15,16</sup> As online platforms develop, these have become increasingly interactive including breakout rooms, workshops, and polling allowing greater audience participation. Social media has been used to disseminate learning, host open discussion regarding topics of interest and to spread awareness of teaching resources far and wide. Trainees and educationalists have also created banks of educational videos exclusively using social media and instant messaging platforms making them easily accessible and engaging.<sup>17</sup>

Virtual conferences enable clinicians to attend from across the globe at little to no expense, sharing knowledge and research with the wider medical community.<sup>18</sup> Even the social aspects of a conference can be accommodated with the use of networking areas and industry exhibitions. One conference even had a professional chef cook-along session to make up for the lack of a conference lunch.<sup>19</sup> It is likely that conferences in the future will use a hybrid model, including both face-to-face and virtual aspects in order to make the event more robust and accessible.

These novel teaching opportunities can be accessed by a far greater audience from further afield at convenient times, whilst keeping everyone safe. It is our hope that these resources and events continue to develop after travel restrictions and social distancing rules are lifted to create legacy training resources that can be utilised by clinicians worldwide.

## Training

The surgical workforce must make every effort to train the next generation of surgeons. Whilst elective operations were cancelled in response to the initial spike in COVID-19 cases, every effort has been made since June 2020 to reinstate and protect surgical services and training.<sup>20</sup> This has been facilitated by the separation of elective operating from emergency work in dedicated 'COVID-free/light sites', including private hospitals. Every elective operating site, including private healthcare institutions, should be considered to help continue training.<sup>21</sup>

Whilst emergency operating did not cease, many conditions were managed non-operatively if possible, such as antibiotic therapy for acute appendicitis,<sup>22</sup> further reducing training opportunities. When operating, trainers should ideally identify learning objectives before starting a procedure and discuss these during or after the operation. Every case

should be a learning opportunity and logged in trainees' portfolios as to demonstrate progression through the training programme. Using a structured framework in reflective practice such as the 'What', 'So What' and 'Now What' method is critical to maximising learning opportunities and development as a surgeon.

The supervision of competent trainees undertaking operations that they are able to perform independently also allows observation of their non-technical skills including communication, team-working, and leadership. With COVID-19, resources such as the Non-Technical Skills for Surgeons (NOTSS) course materials are now available free online and surgeons regardless of experience would benefit from further developing these skills.

The increasing development of virtual reality and digital simulation software can enable trainees to develop and maintain procedural and clinical skills alongside the use of simulation box trainers.<sup>23,24</sup> Multidisciplinary team (MDT) participation is also important, to improve both clinical and non-technical skills and should be continued in order to mitigate the impact of changes to training opportunities caused by the ongoing COVID-19 pandemic.

## Clinical supervision

Senior-led teaching ward rounds are as vital as ever for trainees to learn how to apply specialist knowledge to clinical scenarios. Post-take ward rounds can often be most beneficial, providing ample opportunities for case-based discussions. This is also particularly useful for trainees during periods of redeployment to other areas of the hospital such as ICU in order to maximise learning. Whilst this is understandably difficult, experiences in less familiar specialties provide fresh training opportunities enabling you to develop as a healthcare provider.

The healthcare profession has adapted to COVID-19 by increasing the use of telephone and video outpatient consultations.<sup>25</sup> Trainers can observe trainees conducting outpatient appointments in this environment and use these challenging circumstances to hone their telecommunication and outpatient skills. It is likely that remotely conducted outpatient clinics are here to stay.

## Examinations

Several written postgraduate surgical examinations such as the international Intercollegiate Membership of the Royal College of Surgeons examination (MRCS) have been newly computerised in the wake of COVID-19 with candidates completing the assessment using an online platform instead of sitting them in busy exam halls. While this method may not be revolutionary, it is relatively progressive in medicine; a vocation centred on face-to-face inter-personal communication. While technical issues are always a pos-

sibility, the computerisation of written examinations is a logical development, not only by reducing the risk of viral transmission between the 6000 surgical trainees congregating at MRCS exam locations each year, but also by reducing their considerable travel and accommodation requirements.

Many surgical examining bodies are still discussing how best to deliver Objective Structured Clinical Examinations (OSCE) for many examinations in the COVID-19 era. Clinical assessment, non-verbal body language communication and procedural skill testing would be difficult to simulate online. Whilst further increases in COVID-19 cases may dictate necessity to adapt OSCE examinations, many remain hopeful that this can be avoided. However, significant changes have already taken place with the GMC recently approving, for the first time, that the clinical Fellowship of the Royal College of Surgeons (FRCS) examinations should take place this year without the physical examination of a patient.<sup>26</sup> While it is too early to validate this new examination methodology, it does provide a way to assess trainees and enable career progression during the ongoing COVID-19 pandemic.

### Professional development

Throughout the COVID-19 pandemic many would have operated in unfamiliar theatre environments; with new teams who may or may not be familiar with specialist operations, often in different operating theatres with more PPE. This can have a profound impact on team dynamics and ultimately patient safety. Situational awareness and effective communication between staff can be impaired by PPE.<sup>27</sup> Additionally, dehydration, hunger, and tiredness when operating in such conditions raise the risk of error.<sup>28</sup>

Human factors (HF) awareness and training is important to optimise ourselves and reduce the risk of medical error.<sup>29</sup> We recommend colleagues avail themselves of the many online human factors learning resources, podcasts and webinars that now are available for free. During times of reduced surgical activity, it may also prove beneficial to reflect on departmental and team dynamics. It is important to actively lower hierarchy within the team, engage with trainees and empower junior colleagues to be able to speak up without fear of retribution if they have any concerns about patient safety.<sup>30</sup>

Changes in healthcare services have been rapid and evolving throughout the COVID-19 pandemic. Services require extensive auditing and evaluation to ensure that the highest levels of patient safety and quality improvement are maintained. Trainees would benefit from being involved in such processes including hospital managerial decisions to develop their own management and leadership skills in preparation for consultancy. COVID-19-related research opportunities are also available including its implications for surgery, service delivery, patients and clinicians.

### Conclusions

Throughout the initial surge of COVID-19 there was unprecedented change in healthcare services across the world. Surgical training has adapted remarkably to this reduction in surgical activity and disruption to traditional learning opportunities. Innovation and the utilisation of tele and video-conferencing has enabled surgical trainees to access a wealth of educational resources, though with the ongoing rise in COVID-19 cases it has never been more important to reflect on the learning opportunities that exist, and to create others where needed. Despite uncertainty and change, trainee's will continue to progress through their training programmes to become tomorrow's surgeons with the help and investment of their supervisors and mentors.

### Conflict of interest

None to declare.

### Ethics statement/confirmation of patients' permission

Not required.

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