



## Perspective

## Virtual surgical education for foundation doctors in the United Kingdom during COVID-19 pandemic: A qualitative study

## ARTICLE INFO

## Keywords

Surgical education  
Virtual  
COVID-19  
Foundation doctors  
United Kingdom

## ABSTRACT

**Background:** Foundation training in the UK has been impacted by the COVID-19 pandemic. Surgical education in particular has been impacted due to the reduced exposure of teaching in theatres and clinics. To combat this waning exposure, an online teaching series for the foundation doctors, in affiliation with the Royal College of Surgeons of Edinburgh, was designed and delivered nationally during the pandemic. The aim of this study is to assess the feasibility and the reception of an online teaching programme to become an integral part of surgical education.

**Methods:** A series of virtual teaching sessions lasting between 30 and 60 minutes were delivered live by senior surgical trainees and consultants to foundation trainees nationwide. Online feedback was completed after each session and the results were analysed using Microsoft Excel™.

**Results:** 95.2% of the foundation trainees felt more confident on the subjects taught and were satisfied with the teaching series. The majority of the trainees preferred sessions which were short, held every two or three weeks, delivered by senior surgeons, covering a wide range of surgical specialties and conditions.

**Conclusion:** An online surgical teaching series has been shown to be well received by foundation trainees. It provides a realistic opportunity to have a blended learning environment for surgical training nationally during the pandemic.

### 1. Introduction

The UK foundation programme is a 2-year training programme which aims to allow professional and clinical development following graduation from medical school with a minimum of one surgical rotation. Major disruptions caused to foundation training has been brought by the COVID-19 pandemic. The disruption to formal training was recognised by the annual review of competence progression (ARCP) panel with a change in the requirements of satisfactory completion of the foundation programme [1]. Several social distancing rules and restrictions that were implemented by the government have been negatively affecting surgical education. This is especially true for foundation doctors nationwide with the suspension of many non-urgent elective surgeries, reduced exposures in theatres and clinics, and further impacted with reduction in face-to-face lectures and practical teaching sessions [2].

Virtual distance learning has emerged as a feasible and acceptable modality of teaching [3,4]. To combat this waning opportunity impacted by the pandemic on the foundation training in Surgery, an online teaching series, aimed at foundation doctors in the UK, has been designed and delivered nationally in affiliation with the Royal College of Surgeons of Edinburgh [5]. The online sessions were delivered by senior surgical registrars and consultants commencing May 2021. The purpose of the teaching series was to facilitate and continue high quality surgical education and resources for the foundation doctors and encourage and inspire them to become the next generation of surgeons.

The primary aim of this study was to assess the feasibility and the

reception of an online teaching programme to become an integral part of surgical education for foundation doctors. The secondary aim included allowing the teachers to identify and adapt training needs for future sessions.

### 2. Methods

We followed the Standards for Reporting Qualitative Research (SRQR) for our study [6]. Twelve online teaching sessions were delivered live since the commencement of the programme in May 2021 using novel video conferencing platforms such as Zoom™ and Microsoft Teams™. They were all led by senior surgical specialty trainees (ST5 or above) or consultants with each session lasting between 30 minutes and 1 hour. The teaching sessions were promoted nationally via different media channels including Whatsapp™, Facebook™ and email. A moderator was assigned to chair an interactive session for ‘question and answer’ at the end of each session which allowed enquiries to be answered and facilitated learning and feedback for future sessions. The teaching series covered surgical pathologies encountered commonly during the foundation training and in accordance with the membership of the Royal College of Surgeons (MRCS) examination syllabus [7]. Sessions delivered by senior surgical registrars and consultants addressed relevant anatomy, pathophysiology, specific diagnosis and management, associated intraoperative principles and postoperative care. The ‘operation-based’ sessions included appendicectomy, laparoscopic cholecystectomy and inguinal hernia repair.

Ethical approval was not necessary as the study involved trainees

<https://doi.org/10.1016/j.amsu.2022.104192>

Received 26 May 2022; Received in revised form 10 July 2022; Accepted 10 July 2022

Available online 19 July 2022

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only and consent for obtaining and disseminating feedback was obtained from all tutors and participants. A total number of 131 attendants were recorded and feedback on the programme content and presenter was collected using an online questionnaire in Google™ Forms which was sent at the end of each session. A 10-point Likert scale was used ranging from 1 (eg ‘poor’ or ‘strongly disagree’) to 10 (eg ‘excellent’ or ‘strongly agreed’) to rate the overall quality, relevance and usefulness of the session, with free-text comments to provide constructive feedback and suggestions for the presentation and the teacher [8]. The participants were also asked to self-assess their knowledge prior and after the session. Certificate of attendance was given upon completion of feedback. Results were automatically summarised and analysed using Microsoft Excel™.

### 3. Results

Twelve sessions were delivered over a 10-month period, with a total of 131 attendees. A wide range of common surgical specialties encountered during the foundation training were included as detailed in Table 1 on General Surgery, Urology, Vascular Surgery and Trauma & Orthopaedics.

Online feedback forms were completed voluntarily and their attendance were recorded in the online conferencing system used. A response rate of 95.4% (n = 125) was recorded overall. Cumulative feedback data (Fig. 1) on individual sessions showed that the teaching programme was of high quality (90.4%, n = 113), 95.2% (n = 119) of the foundation doctors were satisfied with the content and learning objectives, 92% (n = 115) found the sessions useful with high quality teaching and 94.4% (n = 118) felt more confident on the subject post-attendance (Fig. 2). Most of the foundation trainees (80%) (n = 100) preferred a session which lasted between 30 minutes to an hour which held every 2–3 weeks compared to a 2-h monthly session (Fig. 3).

Further analysis were performed from the data in the ‘free text’ session in the online feedback form. Several recurring themes were:

1. Procedure-based and Senior-surgeons-led teaching. Preference was placed on sessions with demonstration of surgical procedures, and senior-surgeons-led teachings were favoured.
2. Benefits of online platform. It was widely accepted that the online teachings acted as an alternative to the cancelled traditional face-to-face group teachings during the pandemic. The foundation doctors expressed strong preference on the online sessions due to time and cost efficiency and the possibility of recording of the sessions. The use of online platform to deliver common surgical themed didactic lectures to foundation doctors across different deaneries has a clear advantage of reduction in travel and time cost.
3. Wide range of surgical specialties. Majority of the sessions (Table 1) were on General Surgery, Urology and Trauma & Orthopaedics which are common rotations in the foundation training. More sessions were requested on other specialties such as Plastic Surgery, Paediatric Surgery, Cardiothoracic Surgery as a means of inspiration

**Table 1**  
Outline of surgical teaching online sessions.

Orthopaedic emergencies
Introduction to Trauma
Common acute abdomen during on-calls
Breast Cancer and Breast Surgery
Acute appendicitis
Acute pancreatitis
Bowel obstruction
Acute Diverticulitis
Urological Emergencies and Stones Disease
Acute Ischaemic Limb
Aortic Aneurysm
The Disease of acute Gallbladder

Cumulative Feedback on the online teaching using Likert Scale 1-10 (n=125)

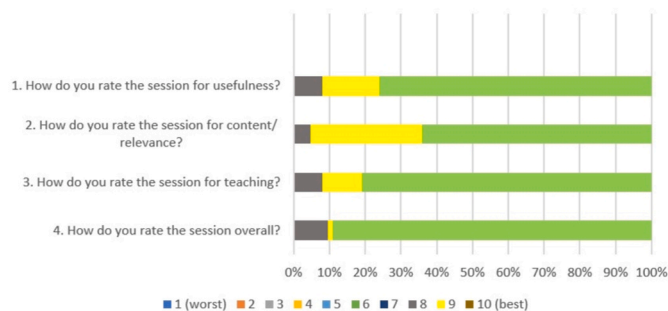


Fig. 1. Stacked bar chart for cumulative feedback on the online teaching using Likert Scale 1-10.

Do you feel more confident on the subject post session? (n=125)

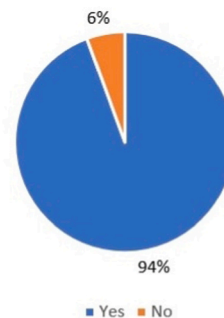


Fig. 2. Pie chart showing confidence level of the foundation doctors after attending the teaching sessions.

Do you prefer 30 min to 1 hour 2-3 weekly session or monthly sessions? (n=125)

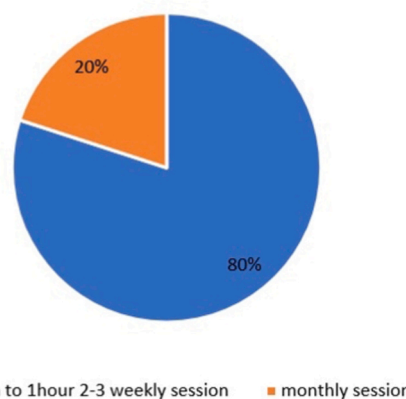


Fig. 3. Pie chart showing preference of the foundation doctors for the duration of teaching sessions.

and providing insight for them to become the next generation of surgeons.

4. Recording of the sessions. It was suggested that the teaching sessions to be recorded and uploaded to online platforms such as Youtube™ for future access and learning. Video recordings should be available only to the foundation doctors using a weblink provided.

#### 4. Discussion

The current UK foundation programme curriculum requires foundation trainees to have a minimum of 60 hours of learning in total, there is now a necessity for foundation schools to increase the use of distance learning where possible. It can reduce not only time, travel and costs to receive and deliver surgical teaching but also allow flexibility and ongoing training for the foundation doctors within social distancing limitations.

An entirely online teaching was feasible and highly rated by foundation doctors, with the aid of multimedia resources such as anatomy images, intraoperative videos and pictures to enhance experience and learning [9]. Knowledge retention can be increased to 50% compared to the usual 10–30% with the supplement of audio-visual elements during teaching [10]. Learning curve of the foundation doctors can then be reduced and patient safety can potentially be improved.

Online approach to the delivery of surgical teaching for foundation doctors provides an unique opportunity for trainees to experience and evaluate the effectiveness of online resource utilisation for previously classroom-based or lecture-delivered teaching. However, it should be recognised that surgical training remains embedded in practical skills acquisition which is best delivered with expert and face-to-face supervision [11]. Simulation training is another means of resumption to usual skills acquisition. It can offer a safe and supportive environment allowing foundation doctors to improve their surgical technique and build up their confidence, gaining insight into the exciting challenge of surgical careers [12].

Feedback will be of utmost importance to continue developing virtual resources to surgical teaching in the foundation programme. Regular and timely evaluation of the teaching series including the design of learning materials, learning goals, and trainees' preferences and characteristics, are essential to ensure the effectiveness of virtual distal learning.

##### 4.1. Limitation

The teaching programme was voluntary, aimed at supporting and facilitating surgical education for foundation doctors in the UK during the pandemic. The unavailability of more experienced senior surgeons posed a challenge to deliver teaching sessions. This resulted in a less frequent teaching and limited range of speciality themes. Through the involvement of the Royal College of Surgeons college tutors, more senior speakers who have expertise on relevant specialties and teaching experience could potentially be invited to deliver future sessions to further enhance learning and quality of the teaching programme.

##### 4.2. Recommendation

Online surgical teaching provides a feasible and well-received mode of learning among foundation doctors in the UK and it can become an integral part of surgical education. Some recommendations are made based on the analysis of the feedback during the teaching sessions and from the online questionnaire form. Short, sessions which held every 2–3 weeks with recordings available for access at their own convenient time were favoured. A wide range of surgical specialties should also be covered and delivered by senior surgical registrars or consultants. Engagement can be encouraged in the form of distribution of attendance certificate. Practical sessions and skill acquisition should still be learned under expert supervision and face-to-face, with the potential use of simulation training in the future. Feedback received can be used to improve and influence other local or regional teachings, providing an opportunity to maximise the foundation training experience in Surgery.

#### 5. Conclusion

An online teaching series on surgical education has been shown to be

well received by foundation trainees. This multispecialty online teaching series provides a realistic opportunity to have a blended learning environment for surgical training nationally during the pandemic and the feedback can be used to improve future surgical training.

#### Ethical approval

N/a.

#### Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

#### Author contribution

Cheuk Tung Kam: study concept or design, data collection, data analysis or interpretation, writing the paper, Hannah Brooke-Ball: Data collection, data analysis, Oluwamayowa Ojofeitimi: Data collection, data analysis, Jaideep Rait: supervision and data validation.

#### Provenance and peer review

Not commissioned, externally peer-reviewed.

#### Annals of medicine and surgery

The following information is required for submission. Please note that failure to respond to these questions/statements will mean your submission will be returned. If you have nothing to declare in any of these categories then this should be stated.

#### Please state any conflicts of interest

We declare no conflicts of interest.

#### Please state any sources of funding for your research

This article did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

#### Consent

Consent have been implicitly obtained from the foundation doctors who attend the teaching and fill in the feedback form.

#### Registration of research studies

N/a.

#### Guarantor

Cheuk Tung Kam.

#### Declaration of conflicting interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

#### Acknowledgement

We thank all the surgical tutors, surgical registrars and consultants who contributed to this online teaching programme.

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Cheuk Tung Kam\*

Department of General Surgery, Maidstone and Tunbridge Wells NHS Trust,  
Kent, United Kingdom

Jaideep Rait

Department of General Surgery, Maidstone and Tunbridge Wells NHS Trust,  
Kent, United Kingdom

Hannah Brooke-Ball

Department of Urology, East Sussex Healthcare NHS Trust, United Kingdom

Oluwamayowa Ojofeitimi

Department of ENT, East Sussex Healthcare NHS Trust, United Kingdom

\* Corresponding author. Department of General Surgery, Maidstone and  
Tunbridge Wells NHS Trust, United Kingdom.  
E-mail address: [cheuk.kam@nhs.net](mailto:cheuk.kam@nhs.net) (C.T. Kam).