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.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
Access and feasibility of orthopaedic training in the independent sector – A Deanery's experience

Jonathan Lenihan, Albert Wee Tun Ngu*, ORCA Collaborative

ST8 T&O SpR, Addenbrookes Hospital, Hills Rd, Cambridge CB20QQ, United Kingdom

Article info
Article history:
Received 9 February 2021
Received in revised form 27 June 2021
Accepted 8 July 2021
Available online 19 August 2021

Keywords:
Training
Education
Trauma & orthopaedics
Independent Sector
Covid 19

Abstract
Introduction: Coronavirus (COVID-19) has negatively impacted healthcare around the world. It has had a major impact on orthopaedic training. The independent sector has been proposed as a facility for future training. Our aim was to provide an overview of the current higher surgical trainees' experience in the independent sector.

Method: Training orthopaedic registrars within the East of England deanery were asked to complete an electronic questionnaire of their training experience in the independent sector between 5th November to 2nd December 2020.

Results: 57 of 64 registrars (89%) from across all thirteen regional training hospitals responded. 44% attended the independent sector, but 7 only assisted (28%). No third year trainees went, but there was an even spread of other training years attending a mean of four sessions. Sixty-six indicative procedures were performed, all with supervisors scrubbed. Second year trainees performed the most cases with 4 on average. Completion of work based assessments was low. 20% trainees reported a negative experience. 80% enjoyed themselves. 52% felt they achieved their goals. 29% trainees felt that independent sector operating would compensate for the shortfall in training brought about by COVID-19. The main obstacles to independent sector training were lack of access and opportunity (51%) and poor induction and paperwork issues (22%)

Conclusion: This is the first deanery-wide assessment of access to and training within the independent sector due to COVID-19. Independent sector operating for orthopaedic trainees is feasible on scale and should be embedded to supplement training in the future. In their current state independent sector facilities are not easily and universally accessible to fulfil training needs.

* Corresponding author.
E-mail addresses: jlenihan@doctors.org.uk (J. Lenihan), albertngu87@gmail.com (A.W.T. Ngu).

https://doi.org/10.1016/j.surge.2021.07.003
© 2021 Royal College of Surgeons of Edinburgh (Scottish charity number SC005317) and Royal College of Surgeons in Ireland. Published by Elsevier Ltd. All rights reserved.
The aim of this study was to assess how feasible and accessible training opportunities were for east of England (EOE) training orthopaedic registrars during the second U.K. national lockdown and whether it may be a viable training option moving forward particularly as we have entered another national lockdown. We believe we are the first U.K. training programme to publish our training experience within the independent sector.

Method

This study was facilitated through the Orthopaedic Research Collaborative (East) Anglia [ORCA], a trainee-led research network. All EOE training orthopaedic registrars and London training orthopaedic registrars working within a regional EOE orthopaedic department were asked to fill in an electronic survey of their training experiences at independent sector facilities during the 2nd UK national lockdown, between 5th November and 2nd December 2020. We have a total of 64 practicing trainees working across 13 regional hospitals.

This electronic questionnaire (Appendix 1) focused on whether higher surgical trainees had been provided the opportunity to attend independent sector operating lists and if they actually attended. Specifically, they were asked how many indicative procedures as defined by the Joint Committee on Surgical Training (JCST) they had performed as first surgeon and how many they had assisted on. Additionally, they were asked how many work based assessments (WBAs) they had completed throughout the domains listed by the Intercollegiate Surgical Curriculum Programme (ISCP). Finally, they were asked to document the overall experience they encountered; whether they felt it was potentially a viable alternative for surgical training; and what obstacles, if any, they had faced in trying to gain access to independent sector operating.

The time period from the 5th November to 2nd December 2020, was selected as sufficient time had passed since the joint letter from NHS England and NHS Improvement and Health Education England to allow a process to be established, whereby trainees could gain access to the independent sector. It coincided with the second national lockdown when the U.K. government and NHS England had chosen to maintain elective operating (unlike the first national lockdown) and to highlight any potential difficulties faced by trainees accessing these lists. Additionally, the time period was chosen, so that trainees would find analysing their logbooks easier and therefore, limit omissions, which could potentially bias results. A recent time period was utilised to limit recall bias; nor confounded by the seasonal related increased leave and reduction of elective work over the festive period.

Results

We received 58 responses, one of whom was from a trainee undertaking an out of program training (OOPT) experience. We did not include their experience in gaining access to the private sector as they were out of the region, but we did include their thoughts about private sector training. 57 out of 64 (89%) trainee responses from trainees across the region were analysed about access and experience in private sector operating across 13 regional hospitals.

The lists performed in the independent sector were NHS initiative list, which is an embassy type list done by an NHS team in the independent sector. All higher surgical trainees within the training programme were indemnified to participate in these lists as stipulated by the contract between the regional hospitals and the independent sector. Trauma cases continued in the respective hospitals and these were elective lists that were performed in the independent sector.

25 trainees had accessed the independent sector (44%) from 10 different hospitals. This included 12 independent sector hospitals. Trainees from 3 hospitals did not have access to the independent sector at all. 24 trainees attended an NHS Initiative list (96%) and 1 trainee attended a private list. 32 trainees did not attend from 10 different hospitals, 4 of the trainees had been offered the chance (13%). Of the 4, 1 responder reported clinical commitments preventing them from attending and the 3 others reported that their consultant had no lists in the independent sector during this time period.

Table 1 shows the grade of training surgeon attending the independent sector and those that did not.

The majority of trainees attending the independent sector did so in lower limb arthroplasty firms, i.e. hip and knee arthroplasty (68%). Other specialties included Shoulder/Elbow (12%); Hands/Wrists (12%) and Foot/Ankle (8%).

1 session was counted as either a morning (8am–12.30pm), afternoon (1pm–5.30pm) or evening (4pm–8pm) session. Trainees attended a mean of 4 sessions (mode 3 and range 1–13) over the time period. Trainees were involved in a mean of 7 cases (mode 6 and range 1–19), of which they were first surgeon on 4 cases (mode 2 and range 0–15). Seven trainees (28%) only assisted and did not perform any first surgeon operating. Table 2a shows the number of indicative operations undertaken by trainees as primary surgeon and Table 2b shows number of indicative operations performed by trainee grade with averages across the year groups. No trainee undertook any plate fixation; kirschner-wire (K-wire) fixation; tension band wire (TBW) fixation; tendon repair; nor intramedullary fixation. 20 non-indicative operations were undertaken by trainees as primary surgeon (range 0–6). All trainees reported that they operated with their supervisor scrubbed at all times.

Trainees assisted a mean of 3 indicative procedures (mode 2 and range 0–12) and 1 non-indicative procedure (mode 0 and range 0–12).

Table 1 – Number and percentage of trainees by year group who did and did not attend the Independent Sector.

| Grade of Orthopaedic trainee | Number of trainees attending (Percentage of year group) | Number of trainees not attending (Percentage of year group) |
|------------------------------|------------------------------------------------------|----------------------------------------------------------|
| ST3                          | 2 (40)                                                | 3 (60)                                                   |
| ST4                          | 4 (50)                                                | 4 (50)                                                   |
| ST5                          | 0 (0)                                                 | 9 (100)                                                  |
| ST6                          | 7 (41)                                                | 10 (59)                                                  |
| ST7                          | 5 (56)                                                | 4 (44)                                                   |
| ST8                          | 7 (78)                                                | 2 (22)                                                   |
Table 3 shows the breakdown of WBAs undertaken by trainees at the independent sector during this time period. 5 trainees (20%) reported a negative experience citing reluctance to allow training and obstruction from theatre staff. 20 trainees (80%) reported that they had enjoyed their time operating in the independent sector and 5 trainees (20%) had “partly” enjoyed themselves. Reasons for the latter included only being allowed to assist and attending a low number of sessions. 13 trainees (52%) felt they had achieved their goals; 8 trainees had “partly” achieved their goals (32%); and 4 trainees had not achieved their goals (16%). Those who had not achieved their goals stated that this was because they had only assisted, whereas those that had “partly” achieved their goals stated that they had been able to do some operating but only of a low volume.

All trainees were questioned about whether they believed independent sector operating would compensate for the shortfall of training brought about by COVID-19: 17 (29%) felt it would; 18 (31%) felt it would not; and 23 (40%) were unsure. The overriding obstacle reported by trainees to being allowed to operate in the independent sector was access and opportunity to do so (51%) followed by induction and paperwork issues (22%).

Discussion

In his editorial address Professor Haddad recognised the impact that COVID-19 had on orthopaedic services and trainees. Whilst their ability to cope in a crisis was applauded it was recognised that their baseline need is for training and for that to return as quickly as possible. J Lund echoed this desire and raised concerns about areas where trainees had lost out during the pandemic and coined the phrase “NoTrainingTodayNoSurgeonsTomorrow.” The statutory educational bodies (SEBs) also recognised this and adjustments made accordingly to the annual review of competence progression (ARCP) awards such as COVID-19 Outcomes 10.1 and 10.2. However standards of training still have to be upheld and the General Medical Council (GMC) of the UK has reinforced that standards need to be met for completion of training. Furthermore, it is understood that dates for completion of certificate of training (CCT) are unlikely to be extended due to the negative impact of COVID-19 alone, reducing the time for trainees to fulfil their curricular requirements.

Khan et al., published their findings from a national survey of 202 UK surgeons to gauge orthopaedic practice and training in their hospitals between 20th March to 20th April 2020. 91% reported all elective operating cancelled; 70% reported disruption to trauma operating; 69% fracture clinics were reduced; 67% reported teaching and study leave cancelled; and 69% felt they would experience a delay to completion of registrar training programmes. This mirrored our regional trainees’ experience during the same period. ORCA (Orthopaedic Research Collaborative (East) Anglia) published our findings of a 97% reduction in elective operating; 64% reduction in elective outpatient activity; 37% reduction in operative trauma; and only 58% of trainees

---

**Table 2a – Breakdown of indicative procedures undertaken by trainees as first surgeons who attended the independent sector.**

| Indicative procedure       | Total number performed by all trainees | Number of trainees who performed | Range of cases |
|----------------------------|----------------------------------------|----------------------------------|----------------|
| Major Joint Arthroplasty   | 33                                     | 9                                | 0–15           |
| Nerve decompression        | 15                                     | 6                                | 0–5            |
| Arthroscopy                | 14                                     | 6                                | 0–7            |
| Osteotomy                  | 3                                      | 2                                | 0–2            |
| Tendon repair              | 0                                      | 0                                | 0              |
| Plate fixation             | 0                                      | 0                                | 0              |
| K-wire fixation            | 0                                      | 0                                | 0              |
| TBW fixation               | 0                                      | 0                                | 0              |
| Intramedullary fixation    | 0                                      | 0                                | 0              |

---

**Table 2b – Breakdown of indicative procedures undertaken by grade of trainee as first surgeon who attended the independent sector. Mean and mode values given for all year groups.**

| Indicative procedure | Grade of orthopaedic trainee | ST3 | ST4 | ST5 | ST6 | ST7 | ST8 | Mean number of procedures | Modal number of procedures |
|----------------------|-------------------------------|-----|-----|-----|-----|-----|-----|---------------------------|----------------------------|
| Arthroplasty         |                               | 0   | 2   | 0   | 1   | 0   | 2   | 1.3                       | 0                          |
| Nerve decompression  |                               | 0   | 4   | 0   | 6   | 3   | 20  | 1.3                       | 0                          |
| Arthroscopy          |                               | 0   | 2   | 0   | 8   | 3   | 2   | 0.6                       | 0                          |
| Osteotomy            |                               | 0   | 10  | 0   | 2   | 1   | 1   | 0.6                       | 0                          |
| Tendon repair        |                               | 0   | 0   | 0   | 0   | 0   | 0   | 0.1                       | 0                          |
| Plate fixation       |                               | 0   | 0   | 0   | 0   | 0   | 0   | 0                         | 0                          |
| K-wire fixation      |                               | 0   | 0   | 0   | 0   | 0   | 0   | 0                         | 0                          |
| TBW fixation         |                               | 0   | 0   | 0   | 0   | 0   | 0   | 0                         | 0                          |
| Intramedullary fixation |                           | 0   | 0   | 0   | 0   | 0   | 0   | 0                         | 0                          |
continued to work in trauma & orthopaedic clinics. That study highlights the direct negative impact that COVID-19 has had on orthopaedic surgical training.

Our data reveals, however, that across our region less than half of trainees (44%) accessed the independent sector between 5th November and 2nd December 2020, and that 28% of those that did only assisted in cases. The main obstacle to operating in the independent sector was reported as lack of opportunity and accessibility. Amongst those that attended, the main obstacle reported were poor or perceived inadequate inductions and paperwork. Trainees were required to complete a registration form, present their ID cards as well as proof of their medical indemnity.

Attending the independent sector to only assist was not confined to just junior trainees: 2 ST3, 1 ST4, 1 ST6, 1 ST7 and 1 ST8 were all only allowed to assist. Whilst any participation in surgery is likely to be welcomed by trainees given service reconfigurations due to COVID-19, little satisfaction in training can be expected from simply assisting. Indeed 3 of 5 trainees who answered that they only partly enjoyed their training cited only being an assistant as their reasoning for not fully enjoying their experience.

There was an even spread of the grades of trainees attending independent sector facilities, although no 3rd year (ST5) trainee attended in our survey. 40% ST3; 50% ST4, 44% ST6, 56% ST7 and 78% ST8 all accessed the independent sector suggesting that it could potentially be used as a training facility for all grades of trainee. Furthermore, less experienced trainees were also allowed to operate as first surgeon, with ST4 trainees undertaking the most number of indicative procedures on average with 4 cases. This again highlights the potential benefits to all trainees.

There was a wide spread in the number of sessions that trainees attended for,7–13 with a mean of 4 sessions over the 4 week period. During this time 66 indicative operations were undertaken, the majority of which were major joint arthroplasty (50%). This is not surprising perhaps as the majority of trainees attended as part of a lower limb arthroplasty firm (68%). 1 trainee performed 15 major joint arthroplasties during this time period that may skew the data in favour of independent sector operating. 20 non-indicative operations were also undertaken. No plate fixations, K-wire fixations, TBW, tendon repairs nor intramedullary fixations took place. This is also unsurprising, as the independent sector facilities are businesses and so focussed on planned elective operating, such as arthroplasty and arthroscopy, rather than trauma.

Supervisors were scrubbed for all cases that trainees performed. Whilst perhaps in the junior years of training this gives trainees confidence and reassurance to operate, it does not allow trainees to progress to independent operating and that responsibility of operating without senior supervision that will be present when they are appointed consultants.

We also examined the educational benefit of operating in the independent sector and used number of WBAs undertaken in this period as a surrogate marker for educational value. Numbers of completed WBAs amongst the different ISCP domains (Procedure Based Assessment (PBA); Case Based Discussion (CBD); Direct Observation of Procedural Skills in Surgery (DOPs); Clinical Evaluation Exercise (CEX)) were low. A mean of 1.5 PBAs were completed by each trainee and less than 1 for the other 3 WBA types. 1 trainee completed 13 PBAs during this time period and if they had not attended the mean would have just over 1. Whilst this is not conclusive evidence that independent sector training may not be of such educational value it does raise suspicions.

We recognise the limitations of our study in the fact that it was a retrospective questionnaire prone to responder and recall bias. However, we achieved over 89% responder rate across our deanery and the questionnaire was conducted within 6 weeks of the elapsed investigative period minimising recall bias. This is a significantly higher rate than other published questionnaires13–15 and therefore is more likely to give a true account of the state of orthopaedic training. We recognise that this is a regional survey and may not be extrapolated to the national state of orthopaedic training, but one would infer that the obstacles faced in terms of accessing independent sector facilities and actually being allowed to operate probably share a common theme. A national survey would give greater insight into regional variations and may aid in answering the question of feasibility of training in the independent sector.

We appreciate that this survey was undertaken during the second national UK lockdown and therefore trainees may have faced challenges around COVID-19 rotas, etc to be able to access independent hospitals for such training opportunities. However as CCT dates are unlikely to be extended and we are, now, in a third national lockdown, such situations may become the normality. If our experience in the second national lockdown continues into the third, the setup of orthopaedic training needs to be urgently addressed. Irrespective of lockdowns, it is well known that elective orthopaedic lists in the U.K are reduced in NHS hospitals due to “winter pressures”.16

We did not look at surgical outcomes, complication rates, nor complexity of cases, which would be an even more robust mechanism to prove the effectiveness of orthopaedic training within the independent sector.

The utility of the electronic logbook as a powerful registry for evidence of operative training is highlighted and could be improved further if there are accommodations for the increased independent sector training, by recognition of all proviers (at the time of writing only procedures in the 2

Table 3 – Work-based assessments undertaken by trainees during their time in the independent sector.

| Work-based assessments | Total number completed | Mean number completed | Modal number completed | Range of work-based assessments |
|------------------------|------------------------|-----------------------|------------------------|-------------------------------|
| PBA                    | 38                     | 1.5                   | 1                      | 0–13                          |
| CBD                    | 12                     | 0.5                   | 0                      | 0–4                           |
| CEX                    | 2                      | 0.1                   | 0                      | 0–2                           |
| DOPs                   | 1                      | 0.0                   | 0                      | 0–1                           |

...
largest independent providers can be entered specifically and therefore searched for if a larger scale evaluation were to be considered or performed.)

The negative impact that COVID-19 has had and is having on orthopaedic training has been widely hypothesised and published. We acknowledge that being a competent surgeon is just one part of the overall skills and qualities needed to be an orthopaedic consultant. We have not looked at other parts of training being impacted such as clinics, ward rounds, post-operative care, on calls, etc. Such issues in these domains also need to be addressed.

In October 2020, the GMC published a newsletter\cite{1} stating ‘The GMC’s work to minimise the impact of COVID-19 on training includes the approval of around 550 additional training locations’. Such additional locations include independent sector facilities. We in the East of England have given our first hand experiences from across the region and the different grades of training, to highlight the difficulties and successes we have experienced in response to the joint statement released by NHS England and NHS Improvement and Health Education of England in 2020. The independent sector alone will undoubt-edly not be able to sustain orthopaedic training, but properly set up established lists and clinics may supplement our training, especially through future predictable periods of reduced NHS operating such as those due to the annual “winter pressures.” Obstacles such as perceived indifference to trainees need to be addressed. Acute NHS Hospitals will continue to function to allow us to gain exposure to those indicative procedures, such as trauma procedures that appear to allude trainees currently in the independent sector.

Conclusion

This survey demonstrates that independent sector operating for orthopaedic trainees is feasible on scale and should be embedded to supplement orthopaedic training in the future. In their current state independent sector facilities are not easily and universally accessible to fulfil training needs. We challenge the governing bodies to look to the future to organise an established framework for trainees to access opportunities within the independent sector and create a culture of training.

Acknowledgments

Members of the ORCA Collaborative: Alastair Vince (Addenbrookes Hospital Consultant T&O Surgeon), Sertaz-Niel Kang (Addenbrookes Hospital Consultant T&O Surgeon), Anish Sanghrajka (Norfolk & Norwich University Hospital Consultant T&O Surgeon), Rosamond J Tansey, Jaison Patel, Ignatius Liew, Aaron Rooney, William Matthews, Hammad Sadique, George Joseph Michael Hourston, Ady Abdelhaq, Mohammed Almustafa, Jennifer Barwell, Aroon Baskaradas, Jehan Butt, Benjamin Davies, Joe Dixon, Mike Dunne, Hassan Fawi, Rachael Fisher, James Gill, Luke Granger, Catherine Hatzan-tonis, Simon Hislop, Samuel Hopwood, Charles Howell, Sumon Salmon Huq, Silvester Kabwama, Timothy Karssiens, Vishal Kumar, Karadi Hari Sunil Kumar, Moritz Lebe, Karl Logan, Alexandra Macmillan, Nishil Modi, William Nabulyato, Joshua Ong, Humza Osmani, Sunny Parikh, Mira Pecheva, Pamela Garcia Pulido, Jeeshan Rahman, Ashok Ramasamy, Pradyumna Raval, Martha Ricketts, Christine Scarsbrook, Panagiotis Sgardelis, Anand Shah, Kriti Singhaniya, Zain Sohail, Victoria Stohlner, Thomas Stringfellow, Ahmad Al-Sukaini, Hussein Taki, Nadim Tarazi, Omar Toma, Ken Wong.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.surge.2021.07.003.

References

1. British Orthopaedic Association. Management of patients with urgent orthopaedic conditions and trauma during the coronavirus pandemic. Available at: https://www.boa.ac.uk/uploads/assets/ee39d868-9457-4533-9774e973c85246d4/4e3170c2-d85f-4162-a250005461e3b1f/COVID-19-BOASTs-Combined-FINAL.pdf. [Accessed 6 February 2021].
2. NHS. Clinical guide for the management of trauma and orthopaedic patients during the coronavirus pandemic. 2020. Available at: https://abdc.care/sites/abdc.care/files/site/uploads/Images/Speciality%20guide_Orthopaedic%20trauma%20and%20coronavirus_V1_16%20March.pdf. [Accessed 6 February 2021].
3. Lund J. Training during and after COVID-19. Bulletin 2020 Aug 31;102(S1):10–3. https://doi.org/10.1308/rcsbull.TB2020.4. Available at:.
4. Khan H, Williamson M, Trompert A. The impact of the COVID-19 pandemic on orthopaedic services and training in the UK. Eur J Orthop Surg Traumatol 2021 Jan 1;31(1):105–9. https://doi.org/10.1007/s00590-020-02748-5. Available at:.
5. Tansey RJ, Patel J, Sanghrajka A, Ngu A, Liew I, Rooney A, et al. The response of Trauma & Orthopaedic Departments to the first four weeks of lockdown for the COVID-19 pandemic – a trainee-led analysis of the East of England. Surgeon 2021 Feb 1;19(1):e14–9. https://doi.org/10.1016/j.surge.2020.07.007. Available at:.
6. Joint letter from NHS England and NHS Improvement and Health Education England. Agreed principles and guidance around training in the Independent sector for organisations working under the COVID 19 National Contract. Available at: https://www.england.nhs.uk/coronavirus/wp-content/uploads/sites/52/2020/09/CO730-NHSEI-and-HEE-Joint-Clinical-Trainee-Letter.pdf. [Accessed 6 February 2021].
7. Royal College of Surgeons of England. RCS England welcomes training opportunities in the independent sector. 8th September 2020. Available at: https://www.rcseng.ac.uk/news-and-events/media-centre/press-releases/rcs-statement-on-training-in-the-independent-sector/. [Accessed 6 February 2021].
8. Joint Committee on Surgical Training. Certification guidelines and checklists. Available at: https://www.jcst.org/quality-
9. Intercollegiate Surgical Curriculum Programme. Workplace based assessment (WBA). Available at: https://www.iscp.ac.uk/curriculum/surgical/assessment_wbas.aspx. [Accessed 6 February 2021].

10. Haddad FS. COVID-19 and orthopaedic and trauma surgery. Bone Joint J 2020 Apr;102-B(5):545–6. https://doi.org/10.1302/0301-620X.102B5.BJJ-2020-0552. Available at:.

11. Health Education England. Supporting the COVID-19 response: enabling progression at the ARCP. Available at: https://www.hee.nhs.uk/sites/default/files/documents/Enabling%20Progression%20at%20ARCP%2020-04-20.pdf. [Accessed 6 February 2021].

12. Joint Committee on Surgical Training. Training in the private sector: JCST guidance on training implications and principles to consider. November 2018. Available at: Training in the Private Sector: JCST Guidance on Training Implications and Principles to Consider. [Accessed 6 February 2021].

13. Mishra B, Shenouda M, Owen P, BODS Collaborators, Roy B. BODS/BOA survey of impact of COVID-19 on UK orthopaedic practice and implications on restoration of elective services. October 2020. Available at: https://www.boa.ac.uk/resources/bods-boa-survey-of-impact-of-covid-19-on-uk-orthopaedic-practice-and-implications-on-restoration-of-elective-services.html. [Accessed 6 February 2021].

14. Mishra B, BODS collaborators, Roy B. BODS/BOA Survey of impact of COVID-19 on UK orthopaedic practice and implications on restoration of elective services - Part 2. December 2020. Available at: https://www.boa.ac.uk/resources/bods-boa-survey-of-impact-of-covid-19-on-uk-orthopaedic-practice-and-implications-on-restoration-of-elective-services-part-2.html. [Accessed 6 February 2021].

15. MacDonald D, Neilly D, McMillan T, Stevenson I. Virtual orthopaedic teaching during COVID-19: zooming around Scotland. Bulletin 2020 Dec 31;103(1):44–9. https://doi.org/10.1308/rcsbul.2021.12. Available at:.

16. Ajwani SH, Barclay J, Ryan WG. Seasonal variation and “winter bed pressures” leads to reduced operative exposure for higher surgical orthopaedic trainees. Austin J Orthoped Rheumatol 2020;7(3):1094.

17. General Medical Council. Covid disruption hits training for eight in ten doctors GMC survey shows. October 2020. Available at: https://www.gmc-uk.org/news/news-archive/covid-disruption-hits-training-for-eight-in-ten-doctors-gmc-surveys-shows. [Accessed 6 February 2021].