



■ GENERAL ORTHOPAEDICS

The rate of patient deferral and barriers to going forward with elective orthopaedic surgery during the COVID-19 pandemic

**N. D. Clement,
S. Oussedik,
K. I. Raza,
R. F. L. Patton,
K. Smith,
D. J. Deehan**

*From Royal Infirmary of
Edinburgh, Edinburgh,
UK*

Aims

The primary aim was to assess the rate of patient deferral of elective orthopaedic surgery and whether this changed with time during the coronavirus disease 2019 (COVID-19) pandemic. The secondary aim was to explore the reasons why patients wanted to defer surgery and what measures/circumstances would enable them to go forward with surgery.

Methods

Patients were randomly selected from elective orthopaedic waiting lists at three centres in the UK in April, June, August, and September 2020 and were contacted by telephone. Patients were asked whether they wanted to proceed or defer surgery. Patients who wished to defer were asked seven questions relating to potential barriers to proceeding with surgery and were asked whether there were measures/circumstances that would allow them to go forward with surgery.

Results

There was a significant decline in the rate of deferral for surgery from April ($n = 38/50$, 76%), June ($n = 68/233$, 29%), to August ($n = 6/50$, 12%) and September ($n = 5/100$, 5%) ($p < 0.001$). Patients wishing to defer were older (68 years (SD 10.1) vs 65 (SD 11.9)), more likely to be female (65% (44/68) vs 53% (88/165)) and waiting for a knee arthroplasty (65% (44/68) vs 41% (67/165); $p < 0.001$). By September 2020, all patients that deferred in June at one centre had proceeded or wanted to proceed with surgery due to a perceived lower risk of acquiring COVID-19 perioperatively (68%, $n = 15$) or because their symptoms had progressed (32%, $n = 7$). The most common reason ($n = 14/17$, 82%) for patients deferring surgery in September was the perceived risk of acquiring COVID-19 while as an inpatient. When asked what measures or circumstances would enable them to proceed with surgery, the most common ($n = 7$, 41%) response was reassurance of a COVID-19 free hospital.

Conclusion

The rate of deferral fell to 5% by September, which was due to a lower perceived risk of contracting COVID-19 perioperatively or worsening of symptoms while waiting. The potential of a COVID-19-free hospital and communication of mortality risk may improve a patient's willingness to go forward with surgery.

Cite this article: *Bone Joint Open* 2020;1-10:663–668.

Keywords: COVID-19, Elective, Deferral, Delay, Pandemic

Correspondence should be sent to
Nicholas D Clement; email:
nickclement@doctors.org.uk

doi: 10.1302/2633-1462.110.BJO-
2020-0135.R1

Bone Joint Open 2020;1-10:663–
668.

Introduction

Elective surgery has recommenced in the aftermath of the first wave of the coronavirus disease (COVID-19) pandemic.¹⁻³ The current literature suggests that patients developing COVID-19 after elective surgery is associated with a 30-day mortality rate

of 19%.⁴ This new risk raises the question: who would want to have elective surgery during the COVID-19 pandemic?

COVID-19 led to the cessation of all orthopaedic elective work in the UK and across Europe from late March 2020.^{5,6} While there is now a move towards the reintroduction

Table I. The patient' reasons for not wanting to proceed with their elective orthopaedic surgery in September 2020 (n = 17).

| Were the following barriers to going forward with surgery? | Yes, n (%) | No, n (%) |
|------------------------------------------------------------|------------|-----------|
| 14 days of preoperative isolation | 3* (18) | 14 (82) |
| You are currently shielding due to a health condition | 5 (29) | 12 (71) |
| Concerns regarding contracting COVID-19 while in hospital | 14 (82) | 3 (18) |
| Concerns regarding contracting COVID-19 after discharge | 2 (12) | 15 (88) |
| Visitor restrictions while in hospital | 1 (6) | 16 (94) |
| Symptoms have improved so did not need surgery | 0 | 17(100) |
| Increased burden upon NHS | 8 (47) | 9 (53) |

*All patients were employed and did not want to take time off work. COVID-19, coronavirus disease 2019.

of elective surgery, there are inherent risks with this and previous studies of prioritization based on disease severity or case need offer limited guidance.^{7,8} One of the initial steps in restarting elective services is to assess the proportion of patients wishing to go ahead with their planned surgery. At the height of the pandemic (May 2020) only 57% of orthopaedic patients at one centre in London UK wanted to go forward with their elective surgery.⁹ However, as the pattern of disease and public understanding of associated risks of COVID-19 increase, patient enthusiasm to re-engage with elective services may have changed. Furthermore, the authors are not aware of any published literature exploring the patient's reasons why they may want to defer their surgery or what factors would enable them to go forward with surgery. Insight into these may allow planning of future elective services.

The primary aim of this study was to assess the rate of patient deferral of elective orthopaedic surgery and whether this changed according to the time during the COVID-19 pandemic. The secondary aim was the explore the reasons why patients wanted to defer their surgery and what measures/circumstances would enable them to go forward with surgery.

Methods

This study assessed patients on elective orthopaedic waiting lists at three different centres in the UK: Freeman Hospital, Royal Infirmary of Edinburgh (RIE), and University College London Hospital (UCLH). Each of the three participating centres registered this work as an audit or quality improvement project. Patients were assessed during April, June, August, and September 2020. At these different timepoints patients were randomly selected from the waiting lists at the centres and were contacted by telephone. Patient demographics and procedure type were recorded. Patients assessed in April included several orthopaedic elective procedures, whereas all other timepoints assessed only those patients on waiting lists for total hip or knee arthroplasty. Patients were asked: "Bearing in mind the current situation regarding COVID-19, would you be comfortable going to a hospital to have your procedure, or would you rather continue to wait?"

Table II. Rate of patients wanting to defer or proceed with elective orthopaedic surgery according to 2020 timepoint and the study centre.

| Time | Centre | Defer, n (%) | Proceed, n (%) |
|--------------------|---------|--------------|----------------|
| April | UCLH | 38 (76) | 12 (24) |
| 1 June to 5 June | Freeman | 19 (19) | 80 (81) |
| 1 Just to 5 June | RIE | 22 (37) | 38 (63) |
| 20 June to 21 June | UCLH | 27 (36) | 47 (64) |
| August | RIE | 6 (12) | 44 (88) |
| September | RIE | 5 (5) | 95 (95) |

RIE, Royal Infirmary of Edinburgh; UCLH, University College London Hospital.

Each patient was offered the opportunity to remain on the list; defer surgery until a point where he/she was happy; or cancel surgery altogether. A single study centre (UCLH) also asked those patients wishing to defer their surgery in April and June: "If we could assure you that sufficient safety measures were put in place, including a clean operating environment hosted in the private sector and a COVID swab provided on your arrival, would you still wish to proceed with your procedure or would still rather continue to wait?"

To explore the reasons why patients wanted to defer their elective orthopaedic surgery two groups were assessed at a single study centre (RIE). The first group were those that did not wish to proceed in June 2020 with their hip or knee arthroplasty who were subsequently contacted in September 2020 and asked what their reason for deferral was in June 2020. Patients that stated they wished to now proceed with surgery from this same group were asked "what had changed your mind to go forward with surgery?" The second group consisted of patients that wished to defer their elective surgery when assessed in September 2020. These patients were asked seven questions relating to potential barriers to proceeding with their surgery and were recorded with a yes or no response (Table I). In addition, this same group were asked "what measures/circumstances would enable you to reconsider going forward with surgery?"

Statistical analysis. Descriptive statistics was undertaken for the rates of patients that wanted to proceed and defer. Odds ratios (OR) with 95% confidence intervals (CIs) were used calculated the risk of deferral of surgery

Table III. Demographics according to centre for patients on the waiting list for a hip or knee arthroplasty according to their decision to proceed or defer their surgery in June 2020.

| Decision | RIE | | Freeman | | UCLH | | Total | |
|---------------------------|-----------|-----------|-----------|-----------|-----------|----------|-----------|-----------|
| | Proceed | Defer | Proceed | Defer | Proceed | Defer | Proceed | Defer |
| Total, n | 38 | 22 | 80 | 19 | 47 | 27 | 165 | 68 |
| Mean age, yrs (SD) | 64 (12.8) | 66 (10.6) | 66 (11.2) | 69 (10.0) | 67 (13.9) | 70 (9.9) | 65 (11.9) | 68 (10.1) |
| Sex, n | | | | | | | | |
| Male | 18 | 9 | 44 | 9 | 15 | 6 | 77 | 24 |
| Female | 20 | 13 | 36 | 10 | 32 | 21 | 88 | 44 |
| Procedure, n | | | | | | | | |
| Knee | 14 | 14 | 34 | 14 | 19 | 16 | 67 | 44 |
| Hip | 24 | 8 | 46 | 5 | 28 | 11 | 98 | 24 |

RIE, Royal Infirmary Edinburgh; UCLH, University College London Hospital

according to the time period assessed and whether the patient was listed to undergo hip or knee arthroplasty; a chi-squared test was used to assess significance. A *p*-value < 0.05 was defined as significant.

Results

April 2020. A total of 50 patients on an elective orthopaedic waiting list at one centre (UCLH) were contacted at the height of the COVID-19 pandemic (29 and 30 April 2020). This consisted of 15 patients awaiting total hip or knee arthroplasty, 15 upper limb procedures, 15 foot and ankle procedures and five other lower limb procedures. They were asked “Bearing in mind the current situation regarding COVID-19, would you be comfortable going to a hospital to have your procedure, or would you rather continue to wait?” A total of 38 (76%) patients stated they would not want to proceed with surgery (Table II). Of these 38, a further 13 patients would proceed if “we could assure you that sufficient safety measures were put in place, including a clean operating environment hosted in the private sector and a COVID swab provided on your arrival”.

June 2020. As the incidence of COVID-19 in the UK began to recede in the first week of June 2020 following the first wave, a total of 160 patients on waiting lists at Freeman (*n* = 100) and RIE (*n* = 60) were asked similar questions. All were awaiting either hip or knee arthroplasty. One patient cancelled for family reasons and was excluded. The rate of deferral was 19% (19/100) and 37% (22/60) respectively (Table II). Over the weekend of 20 June, a further 74 patients on the waiting list at UCLH for hip or knee arthroplasty were contacted and similar questions asked once more. The rate of deferral was 36% (27/74). These 27 patients were then asked whether or not they would proceed if “we could assure you that sufficient safety measures were put in place, including a clean operating environment and a COVID swab provided for you before your surgery”. This had no impact on their decision to defer surgery. When amalgamating these three groups of patients, 165 patients (71%) wanted to proceed and 68

wanted to defer (29%; Table III). Relative to those patients assessed in April, patients assessed in June were significantly more likely to proceed with surgery (OR 7.7, 95% CI 3.8 to 15.6; *p* < 0.001). Patients wishing to defer were older (mean 68 years (SD 10.1) vs 65 (SD 11.9)), more likely to be female (65%, (44/68) vs 53% (88/165)) and significantly (more likely to be on the waiting list for a knee arthroplasty (65% (44/68) vs 41% (67/165); OR 2.7, 95% CI 1.5 to 4.8; *p* < 0.001).

August and September 2020. A further 50 patients were contacted on 10 August 2020 who were on the waiting list for either hip or knee arthroplasty at the RIE. Of these, 44 (88%) wanted to go forward with surgery (Table II). In September, a further 100 patients were contacted on the waiting list for either hip or knee arthroplasty at the RIE and 95 (95%) wanted to go forward with surgery. When combining the patients assessed in August and September, the rate to proceed (139/150) with surgery had significantly increased relative to the observed rate in June (OR 5.2, 95% CI 2.6 to 10.2; *p* < 0.001). Overall, from April to September 2020 there was an increase in the rate of patients wishing to proceed with elective orthopaedic surgery (Figure 1.)

Barriers to proceeding with elective orthopaedic surgery. The 22 patients who wanted to defer their total hip or knee arthroplasty at the RIE in June were contacted in again in September 2020. Seven had already had their surgery and the remaining 15 had dates for surgery. When the patients were asked their reason, for deferral all stated that it was the risk of acquiring COVID-19 postoperatively. When asked what had changed their mind to go forward with surgery, 15 patients felt it would have to be now (September) while the prevalence of COVID-19 was low and the other seven felt they symptoms had progressed so much they could not delay surgery any longer. Also in September, an additional 25 patients not wishing to proceed with surgery at that time were identified from the orthopaedic elective waiting list at RIE, of which 17 patients were contactable and willing to answer the defined questions to barriers to proceed with surgery. The

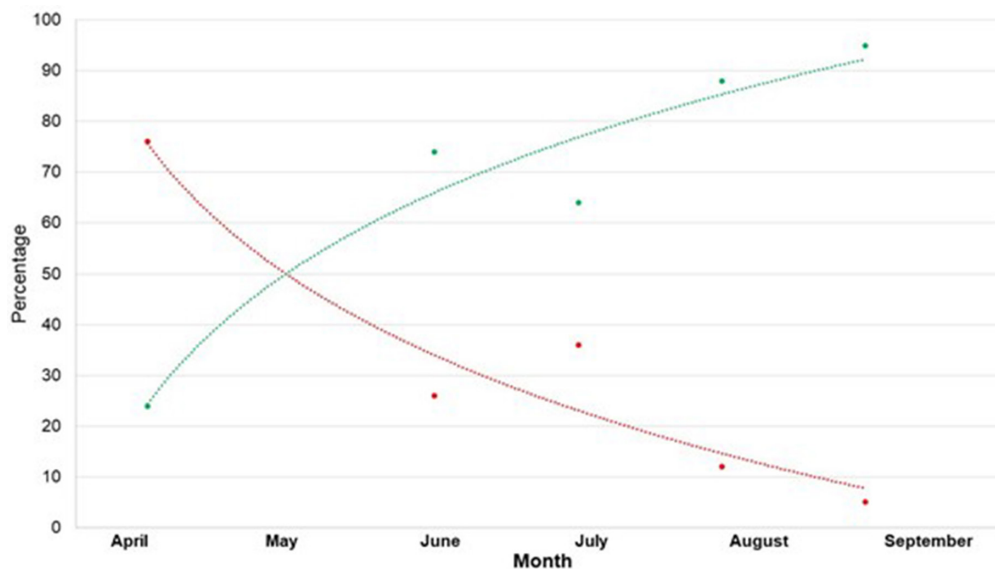


Fig. 1

Rate of patients that want to defer (red) and proceed (green) according to month for 2020. The lines represent logarithmic trend lines.

Table IV. Patient responses (n = 17) to the question “what measures/circumstances would you reconsider going forward with surgery?”

| Response | Total, n (%) |
|-------------------------------------------------------------------------|--------------|
| A COVID-19-free hospital | 7 (41) |
| None at the moment | 5 (29) |
| Shorter isolation period | 2 (12) |
| More information about minimisation of the risk of contracting COVID-19 | 1 (6) |
| More support on discharge | 1 (6) |
| Improvement in infection control measures | 1 (6) |

COVID-19, coronavirus disease 2019.

most common reason (82% (14/17)) for their deferral was the risk of acquiring COVID-19 while as an inpatient after their surgery (Table I). The next most common reason (47% (8/17)) was not wanting to increase the burden on the NHS (Table I). All three patients stating that the 14-day preoperative isolation period was a barrier to going forward with surgery were in fulltime employment. When the patients were asked what measures or circumstances would help enable them to proceed with surgery, seven wanted reassurance of a COVID-19-free hospital and five stated “none” (Table IV).

Discussion

This study has demonstrated the rate of patients wanting to proceed with their planned elective orthopaedic surgery increased during the COVID-19 pandemic from 24% (12/50) in April to 95% (95/100) in September 2020. In June 2020, at the height of the first wave of the pandemic, the offer of sufficient safety measures was not enough to persuade patients to go forward with their surgery. However, by September 2020, all patients that deferred in June had proceeded or wanted

to proceed with surgery, due to their perceived lower risk of acquiring COVID-19 perioperatively or because their symptoms had progressed and they could not wait any longer. Although the proportion of patients wishing to defer their surgery was low in September 2020, the main reason for this deferral at that timepoint was due to the perceived risk of acquiring COVID-19 while an inpatient after their surgery.

Rate of deferral for elective orthopaedics is likely to be directly related to the patient’s perceived risk of acquiring COVID-19 and the associated mortality rate. This is supported in the current study, with a rate of deferral at the height of the pandemic of more than 50%, consistent with the results of Chang et al⁹, which subsequently decreased to 5% in September 2020 as the prevalence of COVID-19 also decreased after the first wave.¹⁰ Furthermore, the main reason (82%) why patients did not want to proceed with their surgery in the current study was due to fears of acquiring COVID-19 in hospital. The rate of acquiring COVID-19 after elective surgery is currently difficult to quantify. A recent study of 528 elective orthopaedic procedures at the height of the pandemic in March and April 2020 identified two patients that developed COVID-19 postoperatively (i.e. a 1 in 264 chance).¹¹ However, this was during a period when there was no preoperative screening or hospital precautions for COVID-19 and this risk may be lower with green COVID-19 free pathways.² The next question a patient may ask might be : “what is my mortality risk should I be one of 264 patients that develop COVID-19 postoperatively?” Mortality data from the COVIDSurg group suggests the 30-day mortality was 19% (n = 53/278) for patients undergoing all elective surgical procedures, although only 20 of these were

elective orthopaedic procedures.⁴ Therefore, from this data, it could be hypothesized that the risk of dying from COVID-19 after an elective orthopaedic procedure may be approximately one in 1,000. This quantification of the risk may help patients to aid their decision to proceed or defer with elective surgery. However, the mortality rate may be lower than this with the adoption of new patient COVID-19-free pathways and may also be related to the individual patient's own background mortality risk that should be taken in account when informing them of the potential risks of surgery.^{2,3,11}

Key guidelines on restarting the elective component of the NHS must remain flexible as there is a move from a 'urgency-intensity matrix' decision regime towards resumption of scheduled work.¹²⁻¹⁴ No previous scenario exists to act as a template, although winter pressures do lead to limited annual postponements.¹⁵ Careful planning and explanation of the risks is necessary to minimize distress, optimize patient safety, and most efficiently utilize the reduced elective orthopaedic service.¹⁶ This requires continuous and flexible planning. Inpatient stay is associated with risk and there is an argument for focusing on day case work or healthy American Society of Anesthesiologists (ASA) grade¹⁷ 1 patient mix,² but this may be to the detriment of older, less healthy individuals and does not account for the socioeconomic impact of providing continued nonoperative care for long-term treatable surgical conditions, which can lead to worsening comorbidity.^{18,19}

In May 2020 the British Orthopaedic Association (BOA) published guidance the restarting of non-urgent orthopaedic care (version 1.1), which included prioritization of patients and description of pathways.²⁰ This guidance states that all priority patients of two or more (procedures that can wait one month or more) should follow a "green" COVID-19 free patient pathway.²⁰ There are differing definitions of "green" pathway according to the infrastructure available at each centre, which are ranked from gold (separate site COVID-19-free centre) to bronze (a mixed COVID-19 centre that is able to be physically separated from other departments). The BOA guidance also describes precautions to be taken that consist of: 14 days self-isolation or shielding (within their household), screening for symptoms, testing for COVID-19 prior to surgery (72 hours), and social distancing prior to treatment.²⁰ However, when explained to deferring patients at UCLH during June 2020, these measures did not result in a reversal of their decision. This suggests that there may be deeper concerns in this cohort and that the perceived benefits of surgery do not outweigh the perceived risks. The association between deferral rate and COVID-related mortality suggests that wider societal concerns are implicated rather than patient-specific factors. However, as elective surgery is reinstated, it is worth considering that dissatisfaction with long waiting times may be mitigated

by allowing patients to have some choice in the date of their procedure.²¹

COVID-19-free elective patient pathways and precautions continue to evolve with time.^{20,22} Mueller et al²³ suggested a 14-day isolation period preoperatively with a COVID-19 test immediately prior to surgery, which has been shown to be associated with a low probability of death from COVID-19 postoperatively when the test was negative (i.e. the false negative rate was low).²⁴ Mackay et al²⁵ has questioned whether younger and less vulnerable patients require a 14-day preoperative isolation period, which may increase the rate of patients proceeding with surgery as this was main barrier for three (18%) of the patients in the current study to going forward with their surgery. Also to be considered is the risk of acquiring COVID-19 during the patient's hospital stay. One option to limit the potential risk of nosocomial acquired COVID-19 is to use a "cold" site to undertake elective surgery. Lazizi et al²⁶ and Clough et al²⁷ have both demonstrated low rates of postoperative COVID-19 after hip and general trauma surgery on "cold" and elective sites of 4% and 0.9%, respectively. Gonzi et al²⁸ also demonstrated a zero rate of postoperative COVID-19 in a cohort of 58 patients undergoing orthopaedic surgery, the majority being related to trauma, at a COVID-19 free site. Zahra et al³ described their "green" COVID-19 free elective orthopaedic pathway which demonstrated a high rate of patient satisfaction and a low rate of postoperative COVID-19, with only one of their 100 patients developing asymptomatic SARS-CoV-2 infection. A similar study by Chang et al² also described their COVID-19 free elective orthopaedic pathway for 121 patients, whom had isolated 14 days prior to surgery, of which only one patient had a suspected but not confirmed COVID-19 infection with symptoms of anosmia. A secondary effect of these new COVID-19 free elective pathways is a decrease in the capacity due to theatre and ward work flows and social distancing.¹⁶

There are limitations of the current study. The limited number of patients assessed may not be representative of all patients across the UK. However, they were chosen at random from elective orthopaedic waiting lists at three centres distributed across the UK. The current study did not discuss the potential mortality rate after surgery with the patients should they develop COVID-19 and the effect this may have had on their decision to proceed or defer surgery. This a difficult question to assess and may also be related to the individuals own risk factors.⁴ However, may be effective communication of the "general" risks of acquiring COVID-19 postoperatively and the potential mortality rate associated with this may help patients quantify their risk and enable them to make an informed decision. Patients factors such as body mass index, radiological severity of their disease, and level of function were not assessed in the current study, which may all be factors that influence a patients decision to proceed to defer their surgery and should be assessed in future studies.

The rate of elective surgery deferral fell to 5% by September, which was due to a lower perceived risk of contracting COVID-19 perioperatively or worsening of the patients' symptoms while waiting. The potential of a COVID-19-free hospital and communication of the associated risks may improve a patient's willingness to go forward with their surgery in the future, and regular audit will allow appropriate planning of pressurised resources.

Twitter

Follow K. I. Raza @kamzo95

References

1. Myles PS, Maswime S. Mitigating the risks of surgery during the COVID-19 pandemic. *Lancet*. 2020;396(10243):2–3.
2. Chang JS, Wignadasan W, Pradhan R, Kontoghiorghe C, Kayani B, Haddad FS. Elective orthopaedic surgery with a designated COVID-19-free pathway results in low perioperative viral transmission rates. *Bone & Joint Open*. 2020;1(9):562–567.
3. Zahra W, Dixon JW, Mitorabi N, et al. Safety evaluation of a strategy to restart elective orthopaedic surgery during the de-escalation phase of the COVID-19 pandemic. *Bone & Joint Open*. 2020;1(8):450–456.
4. Nepogodiev D, Bhangu A, Glasbey JC, COVIDSurg Collaborative. Mortality and pulmonary complications in patients undergoing surgery with perioperative SARS-CoV-2 infection: an international cohort study. *Lancet*. 2020;396(10243):27–38.
5. Jenkins PJ. The early effect of COVID-19 on trauma and elective orthopaedic surgery. *Transient J*. 2020;2.
6. Giorgi PD, Gallazzi E, Capitani P, et al. How we managed elective, urgent, and emergency orthopaedic surgery during the COVID-19 pandemic. *Bone & Joint Open*. 2020;1(5):93–97.
7. Parvizi J, Gehrke T, Krueger CA, et al. Resuming elective orthopaedic surgery during the COVID-19 pandemic: guidelines developed by the International consensus group (ICM). *J Bone Joint Surg Am*. 2020;102-A(14):1205–1212.
8. Kort NP, Zagra L, Barrena EG, et al. Resuming hip and knee arthroplasty after COVID-19: ethical implications for wellbeing, safety and the economy. *Hip Int*. 2020;30(5):492–499.
9. Chang J, Wignadasan W, Kontoghiorghe C, et al. Restarting elective orthopaedic services during the COVID-19 pandemic. *Bone & Joint Open*. 2020;1(6):267–271.
10. No authors listed. Coronavirus (COVID-19) infection survey pilot: England, Wales and Northern Ireland. Office for national statistics. 2020. <https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/bulletins/coronaviruscovid19infectionsurvey/pilot/16october2020> (date last accessed 16 October 2020).
11. Clement ND, Hall AJ, Makaram N, et al. IMPACT-Restart: the influence of COVID-19 on postoperative mortality and risk factors associated with SARS-CoV-2 infection after orthopaedic and trauma surgery. *Bone Joint J*. 2019;In press.
12. Oussedik S, Zagra L, Shin GY, D'Apolito R, Haddad FS. Reinstating elective orthopaedic surgery in the age of COVID-19. *Bone Joint J*. 2020;102-B(7):807–810.
13. Argenziano M, Fischkoff K, Smith CR. Surgery scheduling in a crisis. *N Engl J Med*. 2020;382(23):e87–2.
14. Stevens J, Clement ND, Patton JT. The Extensile medial Parapatellar approach to the distal femur and knee: anatomic landmarks and surgical technique. *Tech Orthop*. 2018.
15. Herrod PJJ, Adiamah A, Boyd-Carson H, et al. Winter cancellations of elective surgical procedures in the UK: a questionnaire survey of patients on the economic and psychological impact. *BMJ Open*. 2019;9(9):e028753–028758.
16. Liow MHL, Tay KXK, Yeo NEM, et al. From “business continuity” to “back to business” for orthopaedic surgeons during the COVID-19 pandemic. *Bone & Joint Open*. 2020;1(6):222–228.
17. Saklad M. Grading of patients for surgical procedures. *Anesthesiology*. 1941;2(3):281–284.
18. Scott CEH, MacDonald DJ, Howie CR. 'Worse than death' and waiting for a joint arthroplasty. *Bone Joint J*. 2019;101-B(8):941–950.
19. Morris JA, Super J, Huntley D, Ashdown T, Harland W, Anakwe R. Waiting Lists for symptomatic joint arthritis are not benign. *Bone & Joint Open*. 2020;1(8):508–511.
20. British Orthopaedic Association. *Re-starting non-urgent trauma and orthopaedic care: Full guidance*, 2020:1–13.
21. Löfvendahl S, Eckerlund I, Hansagi H, Malmqvist B, Resch S, Hanning M. Waiting for orthopaedic surgery: factors associated with waiting times and patients' opinion. *Int J Qual Health Care*. 2005;17(2):133–140.
22. No authors listed. COVID-19 rapid guideline: arranging planned care in hospitals and diagnostic services. National Institute for health and care excellence. 2020. <https://www.nice.org.uk/guidance/ng179> (date last accessed 16 October 2020).
23. Mueller M, Boettner F, Karczewski D, et al. Dealing with the COVID-19 pandemic in orthopaedics: experiences and procedure in Germany. *Bone & Joint Open*. 2020;1(6):309–315.
24. Kader N, Clement ND, Patel VR, Caplan N, Banaszkiwicz P, Kader D. The theoretical mortality risk of an asymptomatic patient with a negative SARS-CoV-2 test developing COVID-19 following elective orthopaedic surgery. *Bone Joint J*. 2020;102-B(9):1256–1260.
25. Mackay ND, Wilding CP, Langley CR, Young J. The impact of COVID-19 on trauma and orthopaedic patients requiring surgery during the peak of the pandemic. *Bone & Joint Open*. 2020;1(9):520–529.
26. Lazizi M, Marusza CJ, Sexton SA, Middleton RG. Orthopaedic surgery in a time of COVID-19. *Bone & Joint Open*. 2020;1(6):229–235.
27. Clough TM, Shah N, Divecha H, Talwalkar S. COVID-19 consent and return to elective orthopaedic surgery. *Bone & Joint Open*. 2020;1(9):556–561.
28. Gonzi G, Rooney K, Gwyn R, et al. Trauma surgery at a designated COVID-19-free site during the pandemic. *Bone & Joint Open*. 2020;1(6):302–308.

Author information:

- N. D. Clement, MD, PhD, FRCS Ed(Tr&Orth), Orthopaedic Consultant, Department of Orthopaedics, Freeman Hospital, Newcastle, United Kingdom; Department of Orthopaedics, Royal Infirmary of Edinburgh, Edinburgh, United Kingdom.
- S. Oussedik, FRCS(Tr&Orth), Orthopaedic Consultant, Department of Orthopaedics, University College Hospital, London, United Kingdom.
- K. I. Raza, MBChB, Clinical Development Fellow, Department of Orthopaedics, Royal Infirmary of Edinburgh, Edinburgh, United Kingdom.
- R. F. L. Patton, Medical Sciences Student, Medical School; Biomedical Sciences, Medicine and Veterinary Medicine, University of Edinburgh, Edinburgh, UK.
- K. Smith, BSc(Hons), MClInRes, Research Physiotherapist and Research Lead
- D. J. Deehan, MD, MSc, FRCS(Tr&Orth), DSc, Professor of Orthopaedics Department of Orthopaedics, Freeman Hospital, Newcastle, United Kingdom.

Author contributions:

- N.D. Clement: Designed the study, Collected and analyzed the data, Wrote the manuscript.
- K.I. Raza: Collected the manuscript, Reviewed the manuscript.
- R.F. L. Patton: Collected the data, Reviewed the manuscript.
- K. Smith: Collected the data, Reviewed the manuscript.
- S. Oussedik: Designed the study, Collected the data, Wrote the manuscript.
- D. J. Deehan: Designed the study, Collected the data, Wrote the manuscript.

Funding statement:

- No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article.

Acknowledgements

- The authors would like to thank the local waiting list teams and research staff for their support in delivering this project, and especially thank Leona Foley and Judith Jacek at the RIE, Thomas Wilkinson at UCLH, and Stephen Nicholson at the Freeman Hospital. The authors would also like to thank the patients that took part in this project for their time, feedback and in sight into their decision making process regarding whether they wanted to proceed or defer their surgery.

© 2020 Author(s) et al. This is an open-access article distributed under the terms of the Creative Commons Attribution licence (CC-BY-NC-ND), which permits unrestricted use, distribution, and reproduction in any medium, but not for commercial gain, provided the original author and source are credited.