BRITISH JOURNAL OF HOSPITAL MEDICINE

REVIEW

The impact of the novel coronavirus on trauma and orthopaedics in the UK

Catrin Morgan[1]

Aashish K Ahluwalia[2]

Arash Aframian[1]

Lily Li[1]

Stephen Ng Man Sun[1]

Author details can be found at the end of this article

Correspondence to:
Aashish K Ahluwalia;
akahluwalia@doctors.org.uk

Abstract

At first glance, the novel coronavirus pandemic and orthopaedic surgery appear separate entities. Orthopaedic surgeons are not generally considered front-line staff in terms of the treatment of the disease that the novel coronavirus causes compared with anaesthetic and medical colleagues. However, the impact that the novel coronavirus is likely to have on the musculoskeletal injury burden and the morbidity associated with chronic musculoskeletal disease is significant. This article summarises the strategies currently being developed for the remodelling of orthopaedic services in the UK and the emergency British Orthopaedic Association Standards for Trauma and Orthopaedic guidelines released on 24 March 2020 in managing urgent orthopaedic patients during the novel coronavirus pandemic.

Submitted: 27 March 2020; accepted after double-blind peer review: 1 April 2020

Background

On 11 March 2020, the World Health Organization declared the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2, the causative virus for COVID-19) outbreak a pandemic and global health emergency (World Health Organization, 2020a). As of 31 March 2020, there were 719 700 confirmed cases and 33 673 confirmed deaths in 203 countries, areas or territories (World Health Organization, 2020b). Research published by Imperial College London discussed two fundamental strategies to combat the virus: mitigation or suppression (Ferguson et al, 2020). It was estimated that if the UK did nothing, 81% of people would be infected and 510 000 would die from COVID-19 by August 2020 (Ferguson et al, 2020). Having initially adopted mitigation as a strategy, on 17 March the UK Government changed its strategy to that of suppression and on Monday 23 March implemented a strict UK-wide lockdown (Government of United Kingdom, 2020).

At first glance, the COVID-19 pandemic and orthopaedic surgery appear separate entities. Orthopaedic surgeons are not generally considered front-line staff in terms of the treatment of the disease that the novel coronavirus causes compared with anaesthetic and medical colleagues. However, the impact that COVID-19 is likely to have on the musculoskeletal injury burden and the morbidity associated with chronic musculoskeletal disease is significant. This article summarises the strategies currently being developed for the remodelling of orthopaedic services in the UK and summarises the emergency British Orthopaedic Association Standards for Trauma and Orthopaedic (BOAST) guidelines (British Orthopaedic Association, 2020) released on 24 March 2020 in managing urgent orthopaedic patients during the COVID-19 pandemic. The relevant section of the guidelines is given in brackets with the subheadings. These can be accessed via https://www.boa.ac.uk/standards-guidance/boasts.html. The information in this article is correct as of Thursday 9 April.

Restructuring of orthopaedic services (general management considerations)

Elective operating

Emergency restructuring of orthopaedic services has been carried out across the UK to minimise patient and staff exposure to infection, and to redistribute resources. On 17 March, the Government announced that all non-urgent elective operations, including hip and knee replacements, were to be cancelled from 15 April for at least 3 months (NHS England and NHS Improvement, 2020a). Many trusts had already begun, or were in the process of, implementing these measures before this announcement. These measures especially affected dedicated

How to cite this article:
Morgan C, Ahluwalia AK, Aframian A, Li L, Ng Man Sun S. The impact of the novel coronavirus on trauma and orthopaedics in the UK. Br J Hosp Med. 2020. https://doi.org/10.12968/hmed.2020.0137

elective orthopaedic hospitals, resulting in the entire remodelling of their services by opening their doors to trauma and repatriations from neighbouring hospitals to help free up acute beds.

Staffing and redeployment

The orthopaedic workforce has been remodelled from a largely consultant-led to a more consultant-delivered service, with the redeployment of foundation doctors, core trainees, registrars and some consultants to the emergency department, intensive care units and medical wards. This has resulted in senior orthopaedic decision makers stepping down to roles usually carried out by their juniors. New rotas have been created to allow for likely absences as a result of sickness and to reduce the number of staff members in the hospital at any given point, thus minimising staff exposure to potential infection. With the redeployment of musculoskeletal physiotherapists to areas such as respiratory medicine, rehabilitation services are also being reduced, with written, telephone and web-based consultations being given to patients where appropriate. Integral members of the theatre team including anaesthetists, scrub nurses and operating department practitioners have also been redeployed to the front line.

Emergency department restructuring (principles for outpatient management)

As outlined in the new BOAST guidelines, orthopaedic units are now aiming to deliver a 7-day trauma clinic/minor injury unit with patients directed to this service straight from emergency department triage (British Orthopaedic Association, 2020). This helps to free up emergency department doctors and nurse practitioners who normally manage these patients to other areas of the emergency department, such as the COVID-19 areas. During emergency department triage, these patients are screened for any signs or symptoms of COVID-19 to reduce the risk of transmission to other patients and healthcare workers. At present, screening remains limited to basic observations and questioning. Patients who require sedation, for example in the case of a shoulder dislocation, remain in the emergency department but are reviewed and managed directly by the orthopaedic team (British Orthopaedic Association, 2020).

Radiology (principles for outpatient management)

Radiology is a vital part of everyday orthopaedic practice. However, with both chest radiographs and computed tomography being important investigations in managing patients with COVID-19 (Rodrigues et al, 2020), the pressure on this service is high. The new BOAST guidelines advise that imaging should only be requested after the patient has been assessed in the trauma clinic and repeat imaging should be avoided. Follow-up imaging should only be performed if this is likely to result in a significant change in management. If available a mini C-arm can be used in the trauma clinic, and computed tomography scans avoided to free up resources for diagnosing COVID pneumonitis (British Orthopaedic Association, 2020).

Operating theatres (principles for inpatient management)

Owing to the remodelling of theatres and theatre recovery areas to intensive care beds, the availability of theatres and theatre resources has been significantly reduced. Some trusts are running a limited trauma list, while others have combined their trauma list with the emergency list. Other centres in London are negotiating with private hospitals for day case trauma to be performed there. The new guidelines indicate the need for a daily strategy meeting with theatre coordinators and a consultant from anaesthetics and each surgical speciality to discuss theatre use and patient prioritisation (British Orthopaedic Association, 2020).

Orthopaedic surgery involving high-speed devices, such as drills, are aerosol-generating procedures. These are high risk for spreading the novel coronavirus, and therefore appropriate personal protective equipment is required in line with public health guidance (NHS England and NHS Improvement, 2020b). There is also national guidance for operating theatre ventilation for proven or suspected COVID cases (Department of Health and Social Care et al, 2020). Laminar flow theatres should be used and the theatres should not be used by staff or patients for 20 minutes after the patient leaves if conventionally ventilated, or 5 minutes if ultraclean ventilation is used. However, this guideline is constantly being updated and is therefore subject to change. There is limited guidance on patient recovery, but because

many theatre recovery areas are being converted into intensive care beds, patients are more likely to be recovered in the operating theatre. This can slow patient flow and further limit theatre efficiency and availability.

Outpatient clinics (principles for outpatient management)

Elective clinics

During the coronavirus pandemic, there is an emphasis on minimising outpatient visits and reducing face-to-face consultations especially in an elective setting. At the authors' trust, all patients receive a text message informing them not to attend the clinic unless they are contacted. The patients are screened and triaged by orthopaedic consultants and categorised into urgent or routine. Those patients suitable for routine review are contacted via phone consultation and a 3-month treatment delay is offered. Those patients that are triaged as urgent, including patients who may have cancer and patients who may have an infection, are being redirected into a few select trusts, such as the elective centres.

With the redeployment of physiotherapists, there is a focus on technology-assisted rehabilitation which results in improved patient satisfaction, pain and outcome scores compared with conventional therapies (Russell et al, 2011; Chen et al, 2016). Online platforms are being developed, for example OnTheMend (https://www.onthemend.com/) which is designed to support patients and healthcare professionals during the rehabilitation process. An example of a measure in place to reduce the number of face to face consultations involves either district or practice nurses, or patients sending in photos of concerning operative wounds via a secure network. These photos are then reviewed by an orthopaedic surgeon to decide whether a face to face consultation is required, or if telephone advice is sufficient.

Fracture clinics

A similar process is in place in regards to fracture clinics. All follow-up decisions are made by consultants, with fractures clinics adapting a 'virtual fracture clinic' model, which had already been established in some trusts before this pandemic (Vardy et al, 2014). There is a focus on the use of removable casts or splints to reduce follow-up requirements. There is currently conflicting evidence as to whether or not the use of plaster saws to remove plaster casts is an aerosol-generating procedure and urgent clarification is required. As per the new BOAST guidelines, all decision making in regards to fracture management is recorded in the patient's medical records with a specific note that the patient was assessed and treated during the coronavirus pandemic (British Orthopaedic Association, 2020).

Management of trauma and urgent orthopaedic conditions (management of specific injuries)

An integral part of any orthopaedic trauma service is the daily trauma meeting with all members of the multidisciplinary team in attendance. However, in many hospitals this is now reduced to a minimum number of staff in attendance with the potential for it to be delivered by an online platform to minimise social contact.

The new BOAST recommendations for the management of specific injuries are summarised in Table 1 (British Orthopaedic Association, 2020). The guidance recognises that some patients are likely to require late reconstruction, specifically in regards to upper limb fractures. This guidance also states that patient-initiated follow up should be the default, which is significantly different from previous BOAST fracture clinic service guidelines, which stated that patients should be seen in a new fracture clinic within 72 hours of presentation (British Orthopaedic Association Standards for Trauma, 2013).

Lower limb fragility fractures (lower limb fragility fractures)

Despite the Government lockdown, elderly patients are still likely to fall in their own homes or care homes and sustain neck of femur fractures, but the presentation may be delayed. Therefore, this is an important patient group to consider during the COVID-19 pandemic, particularly as they are an 'at risk' group for coronavirus infection (Chen et al,

Table 1. Management of specific conditions during the coronavirus pandemic

Injury	Management
Upper limb fractures (clavicle, humeral, wrist)	Non-operative
Penetrating injuries (no contamination or neurological deficit)	Sutured in the emergency department or minor injury unit
Abscesses	Incision and drainage in the emergency department or minor injury unit under local anaesthetic
Ligamentous injuries of knee	Manage with a knee brace

From British Orthopaedic Association (2020)

2020). The guidance remains that the care of these patients is a surgical priority and that the Best Practice Tariff for these patients remains in place. As these operations were usually performed on a dedicated trauma list before this pandemic, it is difficult to predict how running a shared-speciality emergency list may affect the prioritisation of these patients, combined with the potential reduction in the availability of an orthogeriatric service because of the redeployment of medical doctors.

The latest BOAST guidelines state that it is reasonable to offer hip hemiarthroplasty rather than total hip replacement if suitable surgeons are not available (British Orthopaedic Association, 2020). This is a change from current National Institute for Health and Care Excellence (2017) guidelines for intracapsular neck of femur fractures which state that a a total hip replacement should be offered to patients that:

1. Mobilise with one stick outdoors (or independently)
2. Have no cognitive impairment
3. Are medically fit for anaesthesia.

However, in these unprecedented times, the priority for these patients is now:

1. Be able to bear weight fully immediately postoperatively
2. Reduce length of inpatient stay
3. Reduce exposure to coronavirus.

In some trusts across London, these patients are being moved postoperatively to private hospitals.

On 25 March separate guidelines were published by the British Orthopaedic Association on the perioperative care of people with fragility fractures during the coronavirus pandemic. These guidelines state that confirmed or suspected COVID-19 infection should not be a reason to delay or cancel surgery. Regional or spinal anaesthesia is recommended if possible to reduce the risk of aerosol generation. Full guidelines can be accessed at https://www.boa.ac.uk/standards-guidance/clinical-guide-for-the-perioperative-care.html.

Major trauma networks

During the COVID-19 pandemic, the UK trauma network remains in place and patients with life- or limb-threatening injuries remain an immediate priority. However, as the pandemic progresses the trauma network is likely to undergo changes. It is possible that as a result of the lockdown, the volume of major trauma will drop, following the experience in Italy where centres reported a 50% reduction in major trauma (Fojut, 2020). However, similar to those patients sustaining neck of femur fractures, trauma in older people is likely to remain at similar levels. Initially in London, trauma units have been asked to treat more of the complex trauma locally, and a change of triage criteria has been implemented for the London Ambulance Service since 26 March, such that more of the complex trauma cases will be first directed to local trauma units.

It is also important to consider the increasing demands that managing patients with COVID-19 will have on critical care and the impact this may have on trauma patients. These patients are still going to require blood products, but a 15% drop in blood donation was noticed the week beginning 16 March and this is likely to reduce further as the lockdown progresses (NHS Blood and Transplant, 2020). Travelling to donate blood is still permitted during the lockdown, and the NHS is currently urging people to keep donating.

Paediatric orthopaedics (management of children with orthopaedic trauma during the coronavirus pandemic)

With any paediatric injury, it is always important to consider the possibility of non-accidental injury. Many paediatric injuries can be managed non-operatively and there is an increased emphasis on this, combined with minimising outpatient visits through phone consultations with parents. The new BOAST guidelines list several suspected diagnoses that can be managed without imaging at presentation to reduce the radiology burden (British Orthopaedic Association, 2020), including soft tissue injuries, wrist, forearm, clavicle, proximal humeral fractures, long bone fractures with clinical deformity and foot fractures without clinical deformity. The new guidelines also state that a single follow-up appointment at 4–12 weeks is acceptable for most injuries. If these children are triaged directly from the emergency department to a consultant-led paediatric orthopaedic service, then follow up may not be required at all in some cases.

Paediatric elective services have been postponed indefinitely. New guidelines are being written to offer formal direction for the management of both elective and trauma paediatric orthopaedics, with the focus on the latter for now.

Impact on training

It is also important to consider the impact of COVID-19 on orthopaedic training. Guidance has been released from the four surgical Royal Colleges of the UK and Health Education England in regards to this (Health Education England, 2020; Royal College of Surgeons of England, 2020). This pandemic has resulted in the cancellation of surgical exams, fellowships, surgical courses, postponement of rotations for trainees, and the redeployment of surgeons to non-surgical specialities. National recruitment of orthopaedic registrars has been significantly modified to no longer involve an interview and applicants will now be allocated training numbers based on their self-assessment score. Therefore, a lot of uncertainty and anxiety remains in regards to this. Support for trainees and staff wellbeing is paramount at this time.

Conclusions

The COVID-19 pandemic has led to the restructuring of orthopaedic services and to altered guidelines in the management of specific injuries. Cancellation of elective surgery at this time, although appropriate, will have a significant impact on musculoskeletal morbidity and future NHS waiting lists. The UK orthopaedic community is continuing to develop strategies to deliver a safe musculoskeletal skeletal service at this difficult time, while many members of the orthopaedic workforce move to the front line.

Author details

[1]Department of Trauma and Orthopaedics, Chelsea and Westminster NHS Foundation Trust, London, UK

[2]Department of Trauma and Orthopaedics, Hillingdon Hospital NHS Foundation Trust, Uxbridge, UK

Key points

- The novel coronavirus pandemic has led to the restructuring of the trauma and orthopaedic service in the UK.
- New guidelines have been released by the British Orthopaedic Association in the management of trauma and orthopaedic patients during the COVID-19 pandemic.
- There is an emphasis on the non-operative management of orthopaedic injuries where appropriate and reduced face-to-face consultations.
- The UK orthopaedic community is united in delivering a safe musculoskeletal service during this time of crisis, with many members being redeployed to the front line.

References

British Orthopaedic Association. Management of patients with urgent orthopaedic conditions and trauma during the coronavirus pandemic. 2020. https://www.boa.ac.uk/uploads/assets/ee39d8a8-9457-4533-9774e973c835246d/COVID-19-BOASTs-Combined-v1FINAL.pdf (accessed 2 April 2020)

British Orthopaedic Association Standards for Trauma. Fracture clinic services. 2013. https://www.boa.ac.uk/uploads/assets/7ded8f00-987e-42d5-a389e739b1e03b47/ec9d4564-4fa7-4d08-aef4efc3cede7d53/fracture%20clinic%20services.pdf (accessed 2 April 2020)

Chen M, Li P, Lin F. Influence of structured telephone follow-up on patient compliance with rehabilitation after total knee arthroplasty. Patient Prefer Adher. 2016;10:257–264. https://doi.org/10.2147/PPA.S102156

Chen N, Zhou M, Dong X et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. Lancet. 2020;395(10223):507–513. https://doi.org/10.1016/S0140-6736(20)30211-7

Department of Health and Social Care (DHSC), Public Health Wales (PHW), Public Health Agency (PHA) Northern Ireland, Health Protection Scotland (HPS), Public Health England. COVID-19 guidance for infection prevention and control in healthcare settings. 2020. https://www.gov.uk/government/publications/wuhan-novel-coronavirus-infection-prevention-and-control/covid-19-personal-protective-equipment-ppe (accessed 9 April 2020)

Ferguson N, Laydon D, Nedjati Gilani G et al. Report 9: impact of non-pharmaceutical interventions (NPIs) to reduce COVID19 mortality and healthcare demand. 2020. https://www.imperial.ac.uk/media/imperial-college/medicine/sph/ide/gida-fellowships/Imperial-College-COVID19-NPI-modelling-16-03-2020.pdf (accessed 8 April 2020) https://doi.org/10.25561/77482

Fojut R. How coronavirus is affecting trauma systems in Italy. 2020. https://www.trauma-news.com/2020/03/how-coronavirus-is-affecting-trauma-systems-in-italy/ (accessed 2 April 2020)

Government of United Kingdom. Coronavirus (COVID-19): what you need to do. 2020. https://www.gov.uk/coronavirus (accessed 2 April 2020)

Health Education England. Coronavirus (COVID-19) information for trainees. 2020. https://www.hee.nhs.uk/coronavirus-information-trainees (accessed 2 April 2020)

National Institute for Health and Care Excellence. Hip fractures. Clinical guideline CG124. 2017. https://pathways.nice.org.uk/pathways/hip-fracture#path=view%3A/pathways/hip-fracture/hip-fracture-surgery.xml&content=view-node%3Anodes-surgery (accessed 9 April 2020)

NHS Blood and Transplant. Coronavirus: latest updates. 2020. https://www.blood.co.uk/news-and-campaigns/news-and-statements/coronavirus-covid-19-updates/ (accessed 2 April 2020)

NHS England and NHS Improvement. Next steps on NHS response to COVID-19: letter from Sir Simon Stevens and Amanda Pritchard. 2020a. https://www.england.nhs.uk/coronavirus/wp-content/uploads/sites/52/2020/03/20200317-NHS-COVID-letter-FINAL.pdf (accessed 2 April 2020)

NHS England and NHS Improvement. COVID-19: Guidance for infection prevention and control in healthcare settings; aerosol-generating procedures. 2020b. https://www.gov.uk/government/publications/wuhan-novel-coronavirus-infection-prevention-and-control (accessed 9 April 2020)

Rodrigues JCL, Hare SS, Edey A et al. An update on COVID-19 for the radiologist: a British Society of Thoracic Imaging statement. Clin Radiol. 2020. https://doi.org/10.1016/j.crad.2020.03.003

Royal College of Surgeons of England. Joint policy statement from the royal surgical colleges. 2020. https://www.rcseng.ac.uk/coronavirus/ (accessed 2 April 2020)

Russell TG, Buttrum P, Wootton R, Jull GA. Internet-based outpatient telerehabilitation for patients following total knee arthroplasty: a randomized controlled trial. J Bone Joint Surg Amer. 2011;93(2):113–120. https://doi.org/10.2106/JBJS.I.01375

Vardy J, Jenkins PJ, Clark K et al. Effect of a redesigned fracture management pathway and 'virtual' fracture clinic on ED performance. BMJ Open. 2014;4(6):e005282-2014-005282. https://doi.org/10.1136/bmjopen-2014-005282

World Health Organization. WHO Director-General's opening remarks at the media briefing on COVID-19: 11 March 2020. 2020a. https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020 (accessed 9 April 2020)

World Health Organization. Coronavirus (COVID-19). 2020b. https://who.sprinklr.com/ (accessed 9 April 2020)