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Short Report

Limited implementation of measures to reduce nosocomial spread of COVID-19 in hip-fracture patients in the North West of England

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SUMMARY

Hip-fracture patients are vulnerable to the outcomes of COVID-19. We performed a cross-sectional survey to determine measures employed to limit nosocomial spread of COVID-19 in 23 orthopaedic trauma departments in the North-West of England. Nineteen (87%) hospitals admitted patients to a ward prior to a negative swab, and only 9 (39%) patients were barrier nursed. Hip-fracture patients were operated in non-COVID-19-free theatres in 21 (91%) hospitals. Regular screening of doctors working in trauma and elective areas for COVID-19 was undertaken in three (13%) and five (22%) hospitals, respectively. Doctors moved freely between trauma and elective areas in 22 (96%) hospitals.

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Introduction

In the first surge of the COVID-19 pandemic, a substantial proportion of patients were infected whilst being treated in hospital for another condition. In the UK about 12.5% of cases were contracted in hospital [1]. The CDC recommended

prioritizing acute care and delaying elective care to mitigate the nosocomial spread of COVID-19.

Older age, male sex, obesity, diabetes and recent surgery may increase vulnerability to adverse outcomes from COVID-19 infection [2]. Indeed, hip-fracture patients were found to be extremely vulnerable, with a seven-fold increase in 30-day mortality of up to 36% [3] compared with 6.9% in the pre-COVID-19 era [4].

Therefore, strict infection control measures are essential, to allow acute and elective orthopaedic services to function whilst minimising nosocomial spread of the disease. Public

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[†] COVIDHipFracture study group members are listed in Appendix A.

Table I
Trauma and elective questions in survey

Question	Yes (n = 23)	No (n = 23)
Are all trauma patients swabbed for COVID-19 upon in-patient admission to hospital?	23	0
Do hip-fracture patients have a confirmed negative swab before they arrive at the trauma ward?	4	19
Following admission, are trauma patient's barrier nursed until a negative swab result is obtained? (Barrier nursing was defined as side room or a COVID-19 ward.)	9	14
Is it possible for a hip-fracture patient to be nursed in a bay with another patient in whom the COVID-19 status is not known as the COVID-19 result has not arrived?	19	4
Are doctors working in orthopaedic trauma wards having regular COVID-19 tests?	3	20
Are all elective patients tested for COVID-19 before admission?	23	0
Are elective theatre staff regularly tested for COVID-19?	5	18
Are doctors moving between COVID-19-free and COVID-19-contaminated pathways?	22	1

Health England (PHE) published guidelines for remobilization of services with high-, medium- and low-risk pathways. High-risk patients included those who were clinically suspected or confirmed COVID-19 positive and were to be nursed in a single room or in a specific area until the COVID-19 test results were known. Medium-risk patients were asymptomatic with no recent contact with a known case and awaiting COVID-19 test results and were to be nursed using screens or privacy curtains between beds. Low-risk individuals had no symptoms or contact with a positive case and had a confirmed negative RTPCR swab test within 72 h of admission. Acute hip-fracture patients would qualify as high or medium risk. PHE have also published guidelines for elective cases, including self-isolation, assessment of symptoms, and testing prior to planned surgery, placing them in the low-risk pathway [5]. The purpose of these pathways is to try to reduce cross-contamination of patients. Keeping potentially COVID-19 contaminated trauma patients separate from COVID-19 negative elective patients is crucial to help control nosocomial spread of the virus.

In the second surge of the pandemic the North West (NW) of England has witnessed an exponential growth of cases, far surpassing other areas in the UK [6]. The assessment of current clinical practice in hip-fracture patients may help to identify deficiencies and limit nosocomial COVID-19 in a highly vulnerable population. The aim of this study was to determine infection control measures and their implementation in orthopaedics in National Health Service (NHS) hospitals across the NW of England, and to see whether there was potential for cross-contamination between high-risk acute trauma pathways and low-risk elective pathways.

Methods

Orthopaedic trainees in each hospital (identified through a regional trainee social media group and the NW Orthopaedic

Table II
White space questions in survey

Question	N = 23
What is the turnover time for urgent and non-urgent COVID-19 swabs? (n = 21)	Urgent swab within: 1 h: 4 2–4 h: 9 4–48 h: 8 Non-urgent <12 h: 2 <48 h: 17 <72 h: 2
Do hip-fracture patients have their surgery in a COVID-19 free theatre or in a theatre where COVID-19-positive patients may also be operated on?	COVID-19-free theatre: 2 COVID-19 may be operated: 21
Are COVID-19-positive patients nursed in an orthopaedic ward or in an isolated COVID-19 ward?	Orthopaedic ward: 13 Isolated COVID-19 ward: 9 Other ward: 1

Research Collaborative) were invited to participate and become a study collaborator (COVIDHipFracture study group). If an orthopaedic trainee could not be recruited, the orthopaedic doctor on call (ST1/2 or ST3+ level) was invited to participate. A cross-sectional survey was administered via telephone or e-mail between 12th and 23rd October 2020. Data were analysed on Microsoft Excel.

Results

The survey was undertaken in 23 orthopaedic trauma departments in the NW with a 100% response rate (Tables I and II).

Acute trauma

All 23 (100%) of the hospitals who took part undertook COVID-19 testing in patients admitted with trauma. However, 19 (87%) admitted hip-fracture patients to a trauma ward prior to a confirmed negative COVID-19 swab and only nine (39%) undertook barrier nursing before confirmation of a negative COVID-19 test. Only one (5%) hospital had a curtain or screen between patients. Most hospitals (78%) nursed hip-fracture patients in general orthopaedic wards with only four (17%) in a dedicated hip-fracture ward. Of the patients who were COVID-19 positive only nine (39%) were nursed on an isolated COVID-19 ward. Hip-fracture patients were operated in non-COVID-19 free theatres in 21 (91%) hospitals.

Elective patients

All 23 (100%) hospitals undertook COVID-19 testing in patients admitted for elective surgery.

Screening for COVID-19

Regular screening for COVID-19 in doctors working in orthopaedic trauma and elective surgery was undertaken in

only 3 (13%) and 5 (22%) hospitals, respectively. Furthermore, doctors moved freely between trauma and elective areas in 22 (96%) hospitals. The turnaround time for the result from an urgent swab taken at admission for trauma was less than 1 h in only four (19%) hospitals and for non-urgent swabs the result was available in less than 12 h in two (9.5%) hospitals with the majority (81%) being reported in less than 48 h.

Discussion

There has been an extensive effort to recommence elective surgery, given that elective lists in the first surge of the pandemic were extensively cancelled [7]. Indeed, in August 2020, an estimated 111,000 UK patients had been waiting for elective surgery more than a year, up from around 10,000 at the beginning of 2020 [8]. In the Royal College of Surgeons' survey, 33% of surgeons reported not having done any elective work during the first surge [9]. This study examined infection control measures in orthopaedics amongst hospitals in the NW of England, a region currently identified as a COVID-19 hotspot with an R rate between 1.3 and 1.5 [6,10]. Our survey clearly identifies major deficiencies in the implementation of PHE recommendations for limiting nosocomial infection in hip-fracture patients. We show that whilst prior testing for COVID-19 was undertaken in all hospitals, the majority of patients were allocated to their beds before the result was available, thus allowing spread of COVID-19 not only between patients but also between nursing and medical staff. Doctors working with acute hip-fracture patients were regularly tested in only 13% of hospitals and even in elective areas COVID-19 testing was only undertaken in 22%. Staff in one NHS hospital were not regularly tested and only underwent testing when they delivered NHS work in a private-sector institution. With lack of regular testing, and doctors moving freely between high-risk and low-risk pathways in 96% of hospitals, there was risk of cross-contamination.

We appreciate that resources are stretched in NHS hospitals, especially in small orthopaedic departments, and that this may hinder the segregation of patients and medical staff. However, implementation of rapid and regular reverse transcription-polymerase chain reaction (RT-PCR) testing would enable a more streamlined and efficient means to limit nosocomial infection in the most vulnerable patients, including hip-fracture patients. We did not specifically assess whether delays in swab results delayed surgery; however, anecdotally there are often delays when awaiting confirmation of a negative swab, especially prior to a general anaesthetic being administered. High-risk patients should be given priority in testing as not all trauma admissions have the same vulnerability to COVID-19 outcomes [1]. We gathered data on elective testing of patients and staff, and hence resource allocation within these NHS hospitals. There seemed to be a bias towards ensuring that elective patients remain COVID-19 negative, with more testing for staff and patients working within these pathways. Testing priority and nursing in low-risk COVID-19 areas based on patient risk stratification and vulnerability rather than on the mode of admission (acute trauma or elective) may be preferable. At a societal and professional level, in times of limited resources, priority should be given to the most vulnerable and the most clinically needy, rather than the duration

on an elective waiting list. Regional COVID-19 institutions for the treatment of COVID-19-positive patients and the more urgent treatment of the most vulnerable patients who have tested negative, should also be considered.

In conclusion, we have identified substantial deficiencies in the implementation of PHE infection control measures to limit nosocomial spread of COVID-19 amongst hospitals in the NW of England. There is an urgent need to address the delayed reporting of COVID-19 testing to limit the inevitable increased morbidity and mortality associated with the current second and subsequent surges of the COVID-19 pandemic.

Conflict of interest statement

The authors have no conflicts of interest to declare.

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None.

Appendix A. COVIDHipFracture study group collaborators

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References

- [1] Carter B, Collins JT, Barlow-Pay F, Rickard F, Bruce E, Verduri A, et al. Nosocomial COVID-19 infection: examining the risk of mortality. *The COPE-Nosocomial Study (COVID in Older PEople)*. *J Hosp Infect* 2020;106:376–84.
- [2] Guan Wei-jie, Wen-hua Liang, Zhao Yi, Heng-rui Liang, Zi-sheng Chen, Yi-min Li, et al. Comorbidity and its impact on 1590 patients with COVID-19 in China: a nationwide analysis. *Eur Respir J* 2020;55:2000547.
- [3] Lim MA, Pranata R. Coronavirus disease 2019 (COVID-19) markedly increased mortality in patients with hip fracture – a systematic review and meta-analysis. *J Clin Orthop Trauma* 2020. <https://doi.org/10.1016/j.jcot.2020.09.015>.
- [4] Royal College of Physicians. National Hip Fracture Database (NHFD) annual report. 2019. Available at: https://www.nhfd.co.uk/files/2019ReportFiles/NHFD_2019_Annual_Report_v101.pdf. [Accessed 25 October 2020].
- [5] Public Health England. COVID-19: guidance for the remobilisation of services within health and care settings. Infection prevention and control recommendations. 2020. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/910885/COVID-19_Infection_prevention_and_control_guidance_FINAL_PDF_20082020.pdf. [Accessed 25 October 2020].
- [6] Office of National Statistics. Coronavirus (COVID-19) infection survey, UK: 25 October. 2020. <https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/bulletins/coronaviruscovid19infectionsurveypilot/latest>. [Accessed 25 October 2020].
- [7] COVIDSurg Collaborative. Elective surgery cancellations due to the COVID-19 pandemic: global predictive modelling to inform

- surgical recovery plans. *Br J Surg* 2020;107. <https://doi.org/10.1002/bjs.11746>.
- [8] Statistical Press Notice NHS referral to treatment (RTT) waiting times data July. NHS; 2020. Available at: <https://www.england.nhs.uk/statistics/wpcontent/uploads/sites/2/2020/09/Jul20-RTT-SPN-publication-v0.pdf>. [Accessed October 2020].
- [9] Survey findings: elective surgery during COVID-19. Royal College of Surgeons of England; 2020. Available at: <https://www.rcseng.ac.uk/news-and-events/news/archive/survey-results-elective-surgery-under-covid/>. [Accessed October 2020].
- [10] The R number and growth rate in the UK. The latest reproduction number (R) and growth rate of coronavirus (Covid-19) in the UK. 2020. Available at: <https://www.gov.uk/guidance/the-r-number-in-the-uk> [last accessed October 2020].