Safety in out-of-hours operating in trauma and orthopaedics at a district general hospital

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ABSTRACT

INTRODUCTION According to the National Confidential Enquiry into Perioperative Deaths (NCEPOD), out-of-hours operating in trauma and orthopaedics should be reserved for life or limb threatening cases only. The aim of our study was to determine the nature of non-emergency work carried out in our trust at night in 2015. The overall efficacy and clinical safety of the services provided was evaluated.

METHODS Surgical activity undertaken after 9pm was reviewed along with patient ASA (American Society of Anesthesiologists) grade, grade of operating surgeon and any complications that occurred following the procedure. Furthermore, the clinical urgency and safety of cases was assessed based on whether there was any record of life or limb threatening indications at the time of admission.

RESULTS Overall, 131 procedures were performed after 9pm, with 102 performed between 9pm and midnight, and 29 after midnight. Consultants performed 16 cases and the remaining 115 cases were operated on by middle grades or specialty trainees. A fifth (20%) of the cases were genuinely life or limb threatening. A total of 123 procedures were classed as having good outcomes. The complication rate was 8%.

CONCLUSIONS In our study, 80% of the procedures performed after 9pm could not be categorised as life or limb threatening. Appropriate CEPOD classification would ensure that only life or limb threatening cases were listed for theatre after 9pm. Alternative methods of operating within working hours should be considered.

KEYWORDS

CEPOD – Out of hours – Trauma and orthopaedics – Life or limb threatening – Safety

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Over the last two decades, there has been a shift away from night time operating in orthopaedics. In most hospitals, cases that are not life or limb threatening are no longer operated on after midnight.

The change in practice was initiated by the National Confidential Enquiry into Perioperative Deaths (now known as the National Confidential Enquiry into Patient Outcome and Death [NCEPOD]), which advocated a reduction in non-essential night time operating in hospitals to reduce the number of complications. Its report in 2003 and recommendations from the Royal College of Surgeons of England in 2007 suggest that admission to theatre for non-life and non-limb threatening indications should ideally be before 10pm to allow the case to finish before midnight.^{1,2}

The 2014 out-of-hours activity guidance from the Association of Anaesthetists of Great Britain and Ireland (AAGBI) and the Royal College of Anaesthetists states only immediate or urgent procedures should be conducted after 9pm.³ This is further reinforced by the 2005 AAGBI's document on theatre efficiency, which asserts that emergency lists should be

organised and staffed by senior anaesthetists and surgeons with no other commitments to routine work.⁴

However, our experience revealed that despite an increase in daytime trauma operating, a number of non-essential cases were still being dealt with late at night. The aim of our study was therefore to determine the nature of trauma and orthopaedic activity in our trust on the out-of-hours theatre lists in 2015, and to assess the load of night time operating, especially after 9pm. Furthermore, we sought to evaluate the urgency and details of each case undertaken as well as to review the long-term outcomes of those patients.

Methods

A retrospective analysis was performed of all trauma and orthopaedic emergency work undertaken after 9pm in 2015. Our local database of operating lists was used as an absolute record of all operative activity. The surgical operation notes were analysed for each patient. Times recorded included

when patients were sent for and when they left the recovery area. The grades of the operating surgeon and anaesthetist were noted, as was the ASA (American Society of Anesthesiologists) grade of the patient. Patients were categorised according to the level of clinical urgency (whether immediate surgery was warranted [ie life or limb threatening] or whether surgery could have been delayed until the next day's trauma list). Patient outcomes at the seven-day postoperative clinic review were noted. This included any complications in the immediate postoperative period.

Results

A total of 131 cases were operated on out of hours in 2015. Of these, 102 were admitted to theatre between 9pm and midnight, and the remaining 29 were admitted after midnight. With regard to the ASA grade of the patients, 99 were grade 1, 24 were grade 2 and only 8 were grade 3.

The majority of cases comprised wound explorations ($n=45$, 35%), washout/debridement of infection ($n=24$, 18%) and manipulation under anaesthesia of fractures ($n=23$, 18%) (Fig 1). Of the wound explorations, almost three-quarters (71%) were hand and finger wounds being explored, with a small number of forearm wounds, lower limb wounds and tendon repairs (Table 1). Forty-two cases (95%) were

CEPOD category 3, two (4%) were category 2 and one (2%) was category 1. All patients had a good postoperative outcome.

Of the established cases of infection requiring washout/debridement, 14 cases (58%) were CEPOD category 2 and 10 (42%) were category 3. Four knees required a second washout procedure.

In terms of fracture manipulations, a large proportion (73%) were paediatric fractures in patients aged under 16 years. Figure 2 details the different anatomical sites of the fracture manipulations. A total of 19 cases (83%) were CEPOD category 3 and 4 (17%) were category 2. Two closed fracture reductions were converted to open reductions over the next 24 hours and one case of anterior interosseous nerve dysfunction following a supracondylar fracture was treated conservatively. All cases were neurovascularly intact at presentation.

Figure 3 shows the various anatomical sites for reduction of dislocated joints. All 21 dislocated joints were classed as CEPOD category 1 and had a good postoperative outcome.

Of the fracture cases requiring fixation (Fig 4), four (24%) were open and CEPOD category 2 with the remaining thirteen cases (77%) being category 3 and closed fractures. All cases were neurovascularly intact at presentation. There

Figure 1 Out-of-hours orthopaedic caseload in 2015

Table 1 Wound explorations by type and site

	Hand wound debridement	Finger/thumb exploration	Nail bed repair	Forearm wounds	Foot wound debridement	Tendon repair	Foreign body
Number of cases	11	17	4	3	4	4	2

Figure 2 Fracture manipulations by anatomical site **Figure 3** Reduction of dislocated joints by anatomical site **Figure 4** Types of open reduction and internal fixation

were two complications involving a displaced plate and a K-wire resulting in stiffness.

A consultant surgeon was present in 16 cases whereas middle grades/specialty trainees at various levels performed the remaining 115 cases.

Overall, a total of 126 cases had a good postoperative outcome. There were no life threatening complications for any of the cases operated on after 9pm during the one-year period studied.

Discussion

Also known as emergency lists, CEPOD lists conventionally incorporate all cases requiring acute surgical intervention within 24–48 hours of admission. Such cases are prioritised as per the 2004 classification of intervention set out by NCEPOD.⁹ Numerous surgical and anaesthetic societies advocate 9pm as a limit for non-life or non-limb threatening surgery.^{2–4}

The designated trauma theatre at our trust allows a daily half-day list on weekdays only. Trauma surgery is otherwise performed when space becomes available on elective or CEPOD lists.

For any hospital, operating out of hours has many implications in terms of patient safety, integrity and security of the entire on-call team along with the skill mix available. Furthermore, the potential effects it may have on patients undergoing interventions during these antisocial hours after long periods of starvation cannot be ignored. Patient safety must be considered before making any decision to operate and an assessment should be made of the overall load on the on-call team. The presence of a senior surgeon and anaesthetist is advised.¹

A report in 2004 revealed that excessive trauma workload out of hours was shown to negatively affect the attraction of current and future trainees to orthopaedics as a career.⁶ Most orthopaedic centres in the UK now incorporate daily full-day trauma lists, which has helped greatly to reduce the overall trauma workload out of hours. However, there are still some regions that face increased pressures and may resort to late night surgery as a solution to operating on cases that would otherwise be cancelled.⁷

Despite the NCEPOD recommendations,¹ there still seems to be variation in terms of nocturnal operating among many centres. In 1994 Yeatman *et al* reported that 81.9% of patients presenting to the emergency department could have been scheduled for the following day's trauma list instead of being operated on the same night as emergency cases and had therefore been placed on CEPOD lists inappropriately.⁸ Our findings likewise show that 80% of the

cases were inappropriately listed for theatre. This miscategorisation of patients for CEPD lists still seems to occur in many hospitals, including our centre.

A difference of opinion may still exist among individual surgeons and centres. It is possible that this is a result of increasing pressures on daytime elective work and the lack of all-day trauma lists. Moreover, having specialty trainees performing operations out of hours invariably complicates the medicolegal aspects of late night operating, a practice that does not support supervision of trainees.^{1,8}

Similarly, McKee *et al* highlighted the lack of robust protocols and guidance for operating out of hours in orthopaedics.⁹ In their study, the increasing number of junior trainees operating during unsocial hours without a trainer was seen negatively and emphasised the importance of recognising which operations may require consultants to be present. Their study also showed that a large proportion of acute orthopaedic trauma cases could have been delayed for daytime trauma lists, thereby ensuring the presence of a fully staffed theatre team as well as seniors.

Despite the British Orthopaedic Association's guidelines for orthopaedic interventions,¹⁰ there is still no clear advice stating reasons for safely delaying operations. Even though NCEPD recommends limiting procedures that are non-life or non-limb threatening to daytime theatre lists,⁵ firm guidance on each type of acute trauma case (eg dislocation of hip replacements) is lacking. This has inadvertently raised uncertainty among many orthopaedic surgeons, who seem to be making decisions based on their own judgement rather than on guidelines. This surely risks patient safety and greatly compromises effective, safe and robust management plans out of hours.

Conclusions

Despite the need for operating during night time hours in orthopaedics, many of the cases currently scheduled at our

trust could be safely postponed until the next day. These cases should have been categorised as less urgent and not requiring surgery on a CEPD list. Unfortunately, it appears that if all these non-urgent cases were deferred as suggested, there would be a lack of theatre space and time to cope with the extra daytime workload.

There is indeed a vast area of uncertainty and confusion in terms of prioritising acute orthopaedic admissions, and this could lead to severe medicolegal consequences for the entire on-call team while also greatly risking patient safety. Although daily trauma lists do exist in most centres, extended times for those lists coupled with dedicated weekend trauma lists may ensure completion of all cases in a safe and effective manner under supervision.

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