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SHORT REPORT

Trauma care in older people: charting a path from outlier to excellence

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Abstract

Trauma in older people leads to substantial morbidity and mortality. The National Hip Fracture Database (NHFD) has driven improved practice with units compared to identify outliers. In 2013, our unit was an outlier for mortality post hip fracture (30-day mortality 12.2% vs. 8.3% nationally). This triggered external review. In 2019 the unit was highlighted as an exemplar in the UK. We describe the process that moved us from outlier to outstanding. After the initial review process, we made changes to our healthcare system, with regular reassessment of progress and care quality. Examples include a dedicated hip fracture unit, strong leadership (Nursing, Orthopaedic, Geriatrician, Anaesthetic), consultant-led in-depth monthly mortality reviews, changes to admission pathways and delirium prevention. Improvements were seen in all aspects of hip fracture care in 2019 compared with 2012. Thirty-day case-mixed adjusted mortality halved (12.2–6.1%), with substantial reductions in reoperations and pressure sores. Length of stay reduced by 5.9 days. In 2019 our unit's performance was significantly above the national average for all six indicators assessed by NHFD: prompt orthogeriatric review (97% vs. 91% national average), prompt surgery (85% vs. 68%); NICE compliant surgery (85% vs. 74%); prompt mobilisation (93% vs. 81%); not delirious postoperatively (77% vs. 69%); return to original residence (78% vs. 71%). The NHFD highlighted our Unit as one of nine (from 175 total) highly performing UK trusts. We summarise our service development and improvement work undertaken to achieve 'outstanding' status, which provides a valuable template to units managing trauma in older people.

Keywords: hip fracture, surgery, anaesthesia, quality improvement, older people

Key Points

- In 2013, our unit was an outlier for mortality post hip fracture which triggered an external review.
- After the initial review, we made changes to our healthcare system, with regular reassessment of progress and care quality.
- In 2019, the NHFD highlighted our Unit as one of nine (from 175 total) highly performing UK trusts.

Introduction

The 70,000 annual hip fractures in the UK [1] have an annual bed occupancy of 1.5 million days [2], costing over £1 billion annually (1% of whole NHS budget) [3]. Their care is indicative of trauma unit functioning, with use of best practice tariffs (BPTs) to drive improved care. Trauma in older people leads to substantial morbidity and mortality, with survivors experiencing significant reductions in health-related quality of life [4].

The National Hip Fracture Database (NHFD) for England, Wales and Northern Ireland was established in 2007 with over 97% data capture of hip fracture patients aged 60 years or over in 175 eligible hospitals in these countries [1]. Data are collected on patient and fracture

characteristics, the surgery performed, details of the care patients receive and outcomes, including 30-day mortality. The NHFD aims to promote high-quality clinical care as recommended in national guidelines [5]. In 2010, the NHFD introduced a BPT, a pay-by-performance initiative, where hospitals received a financial supplement per patient if their care satisfied six clinical standards, including surgery within 36 h of presentation. The NHFD has continued to be a driver for improved and consistent practice, with every unit compared against Key Performance Indicators (KPIs) [1] allowing identification of outliers, highlighting excellent care and those where care requires attention.

In 2013, the NHFD highlighted our unit as an outlier for mortality following hip fracture (30 day = 12.2% vs. 8.3% nationally), triggering an external review of our Trusts' service and patient pathway. In 2019 the same process highlighted the unit as one of nine top units nationally.

We describe the process that moved our unit from outlier to outstanding, which we hope will provide a valuable template to services managing trauma in older people.

Methods

Review process

The Trust Medical Director requested an external review, which was undertaken by the British Orthopaedic Association Trauma Group. This multidisciplinary review team comprised individuals with vast experience in hip fracture care. The team comprised of consultant orthopaedic surgeons, orthogeriatricians, anaesthetists and specialist orthogeriatric nurses. The cost to the Trust was in the region of £8,000. Following a structured review of all our services, a full report, including recommendations was delivered rapidly and then followed up with an open question and answer session. The main findings as communicated to the Trust identified hip fracture patients being admitted to non-orthopaedic wards, and lack of continuity of care. Patient outcomes were reviewed in monthly trauma meetings; however, there was little translation to improving day-to-day care. There was no process to learn from deaths or share learning across the teams providing hip fracture care.

Changes made to a hip fracture service (Table 1)

Creation of a specialised hip fracture unit was essential to allow cohorting of new admissions and embed daily geriatric care to all perioperative older patients. The importance at trust operational level was deemed equivalent to an acute stoke or coronary care unit. Active pulling of patients from the emergency department (ED) into ring-fenced beds and step-down of stable patients onto other orthopaedic wards ensured safe patient flow. Geriatrician input to the unit comprised nine programmed activities (PAs) of direct clinical care time. This has largely remained the same despite increasing workload. A successful business case for a Geriatrician middle grade doctor was achieved and the role appointed in 2015 providing 40 h ward cover per week. Geriatricians attend the daily trauma meetings and advocate for hip fracture patients, question theatre delays and prevent unnecessary cancellations. They have also made a significant contribution to orthopaedic junior doctor training, supervision and education.

Identification of strong nursing, therapy and anaesthetic leads empowered staff to take responsibility for evolving and providing good care. Ward staff no longer enforce bed rest but are proactive in washing/toileting and moving patients in preparation for therapy. Physiotherapists carry out in-depth reviews to explore barriers to mobility, and there is improved communication with regard to medical stability, blood pressure and acceptable haemoglobin levels. Therapy priority lists and the use of therapy technicians have enabled greater flexibility in the timing of physiotherapy input to the patients most at need. A successful pilot project demonstrating improved outcomes has led to permanent provision of weekend physiotherapy for Day 1 postoperative patients. Rehabilitation pathways have broadly stayed the same over this time: discharge home (with or without additional care support, with or without physiotherapy); discharge to a rehabilitation facility; or discharge to a new care home either permanently or for ongoing assessment. However, discharge destination is now predicted on admission using clinical judgement, Clinical Frailty Score and a new locally developed physiotherapy discharge tool. This means that all teams are working towards a common discharge goal right from admission.

A named anaesthetic trauma lead is crucial and functions as an advocate and contact point within a huge department. They attend trauma management, mortality and governance meetings across both departments improving communication and feedback on outcomes such as theatres usage/-efficiency and mortality themes/learning. The anaesthetic lead was also responsible for writing an anaesthetic hip fracture Standard Operating Procedure and updating guidelines to ensure anaesthetic practices are appropriate and consistent, even out-of-hours. The most recent improvement work aligned ward and theatres analgesic and sedative use preoperatively and postoperatively. They also developed the use of recovery room haemocue to enable early postoperative blood transfusion. This is now embedded in practice and forms part of the theatre recovery room discharge checklist for hip fracture patients.

Creation of hip fracture mortality meetings brought together the identified clinical leads across the hip fracture pathway. This enabled discussion of care, identification of areas of poor performance and created a positive environment to discuss solutions. Participation in this meeting has been widened to allow teaching of junior staff, management experience for specialty trainees and mutual learning amongst the consultant body. A summary of themes and interventions is produced on a yearly basis and discussed at departmental clinical governance meetings. There has been significant and sustained improvement in time to theatre as a result of reasons for delays/cancellations being reviewed regularly. In response to evidence of poor end-of-life care

Table 1. Summary of interventions to improve quality of hip fracture care

Quality parameter	Baseline status	Interventions			
		Immediate	**Early**	**Medium**	**Late/On-going**
Infrastructure	• Multiple admitting wards • Long waits • Inappropriate bed usage	• Creation of hip fracture unit by using an existing T&O ward • Cohorting of all hip fracture patients	• Policy for high priority air-mattress use		• Renaming to Elderly Trauma Unit (recognising inclusion of non-hip elderly trauma)
Status	• Low priority within the organisation	• Elevate status of hip fracture within organisation • Ring-fencing of hip fracture beds akin to acute stroke or coronary care unit beds	• Site team education & ED team education		• Feedback of progress to divisional leads and trust board • Lead clinicians raise the profile of hip fracture care
Staffing	• T&O care • Geriatrician liaison	• Shared-care model • Embedding consultant geriatricians to provide a weekday service to the unit • Identifying and empowering nursing leads to the unit	• Identification of geriatrician/ anaesthetic/orthopaedic NHFD leads and ED hip fracture lead	• Geriatrician middle grade appointment 2015	
Review of outcomes	• None	• Re-launching of monthly trauma board MDT and redefining purpose of meetings • Monthly review of Best Practice Tariff achievement and discussion of 'failures'	• Creation of monthly mortality meeting • Regular review of action plan	• Expansion of trauma board and mortality meetings to wider MDT, involving junior staff • Review of all NHFD outcomes	• Geriatrician presence at T&O clinical governance meetings • Presentation of mortality outcomes to division • Presentation of KPIs to Medical director and CEO • Quarterly meeting with community rehab providers and therapy leads, started in 2018
Learning/Teaching	• None		• Geriatrician input to T&O induction sessions • Anaesthetic specialist registrar perioperative sessions in orthogeriatrics	• Creation of a T&O junior doctor teaching programme including geriatric themes • Cross specialty quality improvement projects • Geriatrician supervision of junior doctors	• Targeted teaching for end-of-life care and ReSPECT • Nurse-led training for ward care and medicines management • Targeted delirium/dementia teaching to therapy teams
Admission pathway	• Basic admission proforma for T&O, no checklists or evidence based guidelines	• Creation of comprehensive ED hip fracture checklist and T&O admission proforma • Nerve block and analgesia guidelines	• Delirium prevention awareness for ED and T&O staff • Catheterisation guideline • Pressure ulcer prevention, ED interventions and ward training	• Perioperative medicines management guideline	• Continuous updating of guidelines and proforma by anaesthetic/geriatrician/ED leads

CEO = chief executive officer; ED = emergency department; KPI = key performance indicators; MDT = multidisciplinary team; NHFD = National Hip Fracture Database; T&O = trauma and orthopaedics

Table 2. Outcomes after hip fracture before and after service changes implemented at the trust (outcomes measured in December of each year)

Outcome measure	Year	Unit results	National average results
Patient mortality at 30 days	2012	12.2%	8.3%
	2019	6.1%	6.5%
Mean length of hospital stay (days)	2012	24.4	21.6
	2019	18.5	19.6
Reoperation rate (at 120 days)	2012	2.1%	1.0%
	2019	0.7%	1.1%
Pressure sore rate (during the acute hospital admission)	2012	8.5%	3.6%
	2019	1.1%	2.4%
Patients mobilised Day 1 after surgery	2015	78.1%	79.5%
	2019	92.1%	79.5%
BPT[a] achieved	2015	75.5%	
	2019	80.2%	58.0%

[a]BPT is explained within the Introduction section of the paper

planning and delivery, focused teaching and training on end-of-life care themes, such as recognition of dying, has been introduced.

Results

Improvements at our unit were seen in all aspects of hip fracture care in 2019 ($n = 575$) compared with 2012 ($n = 521$) (Table 2). Thirty-day case-mixed adjusted mortality halved (12.2–6.1%), with substantial reductions in reoperation and pressure sore rates. Length of stay (superspell) reduced by 5.9 days.

In 2019, our unit's performance was above national average for all six NHFD KPIs: prompt orthogeriatric review (97% vs. 91% national average), prompt surgery (85% vs. 68%); NICE compliant surgery (85% vs. 74%); prompt mobilisation (93% vs. 81%); not delirious postoperatively (77% vs. 69%); return to original residence (78% vs. 71%). Nerve block administration rates and time to ward were well above national average. Regarding end-of-life care we achieved high rates of preoperative ReSPECT discussions and care planning. In 2019 our Unit was highlighted by the NHFD as one of nine (from 175) highly performing trusts providing hip fracture care in the UK.

Discussion

This paper provides a clear structure and approach to develop and maintain a high functioning trauma unit serving older people, and by extension, an efficient and effective orthopaedic trauma service. This template generated clear improvements in patient safety, including reduced pressure sore rates, mortality below national average and high levels of Day 1 mobilisation.

Numerous factors enabled the unit to make such substantial improvements, underpinned by openness to external review and embedding agreed outcomes across the entire pathway. Identification of clinical leads across the pathway who took responsibility for changes in their area was key. There was, and remains, regular opportunity for individuals to communicate, review data, share learning and disseminate information constructively. There was and remains strong focus on undertaking small improvements when problems have been identified, recognising that little changes in one area can have big impacts elsewhere in the pathway. Although formalised quality improvement using the Plan, Do, Study, Act (PDSA) processes have not been utilised for every change, there is continuous review of audit and outcome data enabling feedback on the success of each change. This process has been further bolstered by the creation of clear and consistent guidelines and internalising high standards of care within the department ethos.

This paper summarises our service development and improvement work which resulted in an 'outstanding' status from the NHFD in 2019, having previously been an outlier. We believe our work provides a valuable template to unit's managing trauma in older people to help deliver and maintain the best possible care to this patient group.

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References

1. The National Hip Fracture Database Annual Report. 2020. https://www.nhfd.co.uk/20/hipfracturer.nsf/docs/reports2020 (8 July 2022, date last accessed).

2. Johansen A, Tsang C, Boulton C, Wakeman R, Moppett I. Understanding mortality rates after hip fracture repair using ASA physical status in the national hip fracture database. Anaesthesia 2017; 72: 961–6.
3. Leal J, Gray AM, Prieto-Alhambra D *et al.* Impact of hip fracture on hospital care costs: a population-based study. Osteoporos Int 2016; 27: 549–58.
4. Griffin XL, Parsons N, Achten J, Fernandez M, Costa ML. Recovery of health-related quality of life in a United Kingdom hip fracture population. The Warwick hip trauma evaluation – a prospective cohort study. Bone Joint J 2015; 97-B: 372–82.
5. National Institute for Health and Care Excellence.. NICE clinical guideline 124. 2011: https://www.nice.org.uk/guidance/cg124.

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