

# Improving inpatient care with the introduction of a hip fracture pathway

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## Abstract

A system of payment by results exists for the management of hip fractures in England and Wales. Poor performance against the national standards was noted, reflecting failure to deliver optimal care. Through the introduction of a multi-disciplinary patient pathway and clerking pro forma, the proportion of patients earning the best practice tariff uplift increased from 44.4% to 91.7%. This demonstrates a significant improvement in patient care measured against the guidelines, also resulting in a substantial revenue increase for the department.

## Problem

University College London Hospitals (UCLH) NHS Foundation Trust provides an acute orthopaedic service for hip fractures, admitting approximately 120 patients annually. Despite an admission pathway being in place, UCLH performed badly in the 2013 national hip fracture database (NHFD) audit and was one of six hospitals not included in the annual report because insufficient information was submitted.[1] Of the recorded data, performance was poor against the agreed standards of care, which resulted in a low proportion of best practice tariff (BPT) payments and so a loss of income for the department.

## Background

Hip fractures are growing in incidence, with currently 70-75,000 per year in the UK. They present a massive financial burden on the healthcare system (estimated at £2 billion per annum) as well as a high associated mortality rate, with 10% of patients dying within one month.[2]

The NHFD is part of the Royal College of Physicians' falls and fragility fracture audit programme, and is a web-based audit of all 186 acute hospitals in England, Wales, and Northern Ireland, that assesses the management of patients aged 65 or older with hip fractures against nationally-agreed standards, including those from the British Orthopaedic Association and the British Geriatric Society's joint publication 'The care of patients with fragility fracture'[3], and the National Institute for Health and Care Excellence's (NICE) clinical guideline 'The management of hip fracture in adults'.[2]

The data submitted to the NHFD supports the payment by results BPT scheme, where a £1,335 uplift[4] can be awarded per patient for meeting nine criteria[5]: surgery within 36 hours of admission, shared care between orthopaedics and geriatrics, admission using an agreed assessment protocol, assessment by senior geriatrician within 72 hours, documentation of both pre- and post-operative abbreviated mental test (AMT) scores, geriatrician-led multi-disciplinary rehabilitation, a falls assessment, and a bone health assessment.

Compliance with these standards has consistently been shown to be beneficial to patients:

- Friedman et al demonstrated improved outcomes by co-management with geriatricians[6]
- Patel et al showed reduction in mortality with implementation of the NHFD standards[7]
- Thwaites et al reported an increase in patients receiving osteoporosis treatment with shared care[8]
- Gupta published a reduction in time to surgery with geriatrician input.[9]

Several papers have also reported a decreased length of stay following a multidisciplinary care protocol.[10-14]

## Baseline measurement

A retrospective baseline audit was conducted on two months of hip fracture admissions from 2013. Patients were identified from NHFD records, and data gathered from their notes. Twenty hip fracture patients were identified in total, however two were excluded from the audit as they were aged below 65. From the quarterly reports, BPT uplift was only achieved in eight of the 18 patients (44.4%). Of the ten who did not reach minimum standards, four waited longer than 36 hours for surgery, seven waited longer than 72 hours for orthogeriatric review, and nine did not have both AMT scores recorded.

Other variables that are not included in the BPT criteria were also assessed in the audit: fascia iliaca (FI) blocks were only administered in the emergency department (ED) in three of the 18 patients (16.7%), only one had a pain score in ED documented, and only four had pain scores documented on admission to the ward. In addition, using a Nottingham hip fracture score (NHFS)  $\geq 4$  (equating to a >5% predicted 30-day mortality)[15], 15 of the 18 patients were identified as potentially benefiting from high-dependency unit (HDU) level support post-operatively, although only eight (53.3%) ended up being admitted. The mean length of stay in an acute ward was 18.9 days.

## Design

After researching methods used at neighbouring Trusts, the previously-used single-page checklist was redesigned into a clerking booklet. The resulting eight-page multidisciplinary pro forma contained sections for each BPT standard, focusing on which has been shown to improve performance[16]. For example, the AMT questions were incorporated allowing for easy application of the test, and so helping achieve the indicators identified as poor-performing in the initial audit.

NICE guidelines were also included in the booklet, such as pathways on the front page prompting ED clinicians to make a referral to anaesthetics if the patient was appropriate for a block, summaries of the NICE analgesia in hip fracture pathway, and sections adapted from the NICE clinical guidelines allowing for easy documentation of fragility fracture risk (CG146) and falls assessment (CG161). Checklists of essential pre-operative tasks were added, which have been demonstrated to improve the rate of completion of required jobs.[17] Additionally, the NHFS calculator was included, with prompts to book post-operative HDU beds at admission for those with a predicted 30-day mortality > 5%.

## Strategy

A multi-disciplinary hip fracture care group was established, with representation from orthopaedics, geriatrics, rheumatology, anaesthetics, critical care, emergency medicine and therapies, with buy-in for the patient pathway confirmed. Dedicated twice-weekly consultant-led orthogeriatric ward rounds were implemented, and the pathway booklet included in the local induction for emergency department and orthopaedic juniors.

A small pilot of the booklet was undertaken over a one-week period following agreement from the hip fracture care group, where issues such as a lack of space to document FI block consent and nursing actions were identified. The booklet subsequently underwent several small changes to incorporate team members' suggestions.

## Results

After full implementation of the pathway and admission booklet, the same two months in 2014 were re-audited prospectively. Thirty hip fractures were identified, however six were excluded from the BPT (four were under 65 years of age and two were treated non-operatively). The booklet was used at admission in 27 of the 30 patients (90%), however the ED section was only complete in 20 patients (74.1%). Twenty two of the 24 eligible patients received the BPT uplift (91.7%) with both not meeting the criteria of time to surgery as they required extensive pre-operative optimisation on ITU before being deemed fit for surgery. Importantly, all patients had both pre- and post-operative AMTS scores documented.

Of the 24 eligible patients, FI blocks were administered in ED in six patients (8.3% increase). Pain scores were documented on admission in nine patients (31.9% increase). Two of the six who received FI blocks had their pain recorded after 30 minutes (33.3%)

and 14 had their pain score recorded on admission to the ward (36.1% increase). The NHFS was documented in 14 cases (58.3%), which meant that 10 of the 15 patients (66.7%) with a score  $\geq 4$  were admitted to HDU post-operatively, an increase of 13.3%.

The mean length of stay was 16.4 days in an acute bed, which failed to show statistical significance ( $p=0.066$ ) compared to the first audit cycle using the Mann-Whitney U test, as demonstrated in the papers referenced above. However, with a bed-day costing £303 at UCLH, the 2.5 day reduction in length of stay would equate to a saving of over £90,000 if applied to all 120 admissions in a year.

## Lessons and limitations

In designing the pathway, it became clear that given the many different teams involved in providing care to hip fracture patients, a multi-disciplinary team approach was essential with input from several services. As there was an institutional buy-in to improving performance within the national audit, we were readily met with enthusiasm from senior staff. Finding incentives for the junior staff proved harder however, but this was overcome by simplifying the admission process and promoting the time-saving element of the pathway.

## Conclusion

The resulting 47.3% increase in patients receiving the BPT uplift as a result of the procedural changes reflects a significant improvement in the delivery of optimal care. The introduction of the pathway and admission booklet resulted in a higher compliance with national standards. Based on an estimate of 120 cases a year eligible for the BPT, this also represents an additional income of £75,700 per annum for the department.

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## Declaration of interests

Nothing to declare.

## Acknowledgements

UCLH Hip Fracture Care Group