



Royal College
of Physicians

Falls and Fragility Fracture
Audit Programme

National Hip Fracture Database (NHFD) annual report 2017



In association with:



Commissioned by:

National Hip Fracture Database annual report 2017

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www.crowninformatics.com

Falls and Fragility Fracture Audit Programme

The NHFD is commissioned by the Healthcare Quality Improvement Partnership (HQIP) and managed by the Clinical Effectiveness and Evaluation Unit (CEEU) of the Royal College of Physicians (RCP) as part of the Falls and Fragility Fracture Audit Programme (FFFAP) alongside the Fracture Liaison Service Database (FLS-DB) and Falls Prevention Audit. FFFAP aims to improve the delivery of care for patients having falls or sustaining fractures through effective measurement against standards and feedback to providers.

Healthcare Quality Improvement Partnership

The Healthcare Quality Improvement Partnership (HQIP) is led by a consortium of the Academy of Medical Royal Colleges, the Royal College of Nursing and National Voices. Its aim is to promote quality improvement, and in particular to increase the impact that clinical audit has on healthcare quality in England and Wales. HQIP hosts the contract to manage and develop the National Clinical Audit and Patient Outcomes Programme (NCAPOP). Its purpose is to engage clinicians across England and Wales in systematic evaluation of their clinical practice against standards and to support and encourage improvement in the quality of treatment and care. The programme comprises more than 30 clinical audits that cover care provided to people with a wide range of medical, surgical and mental health conditions.

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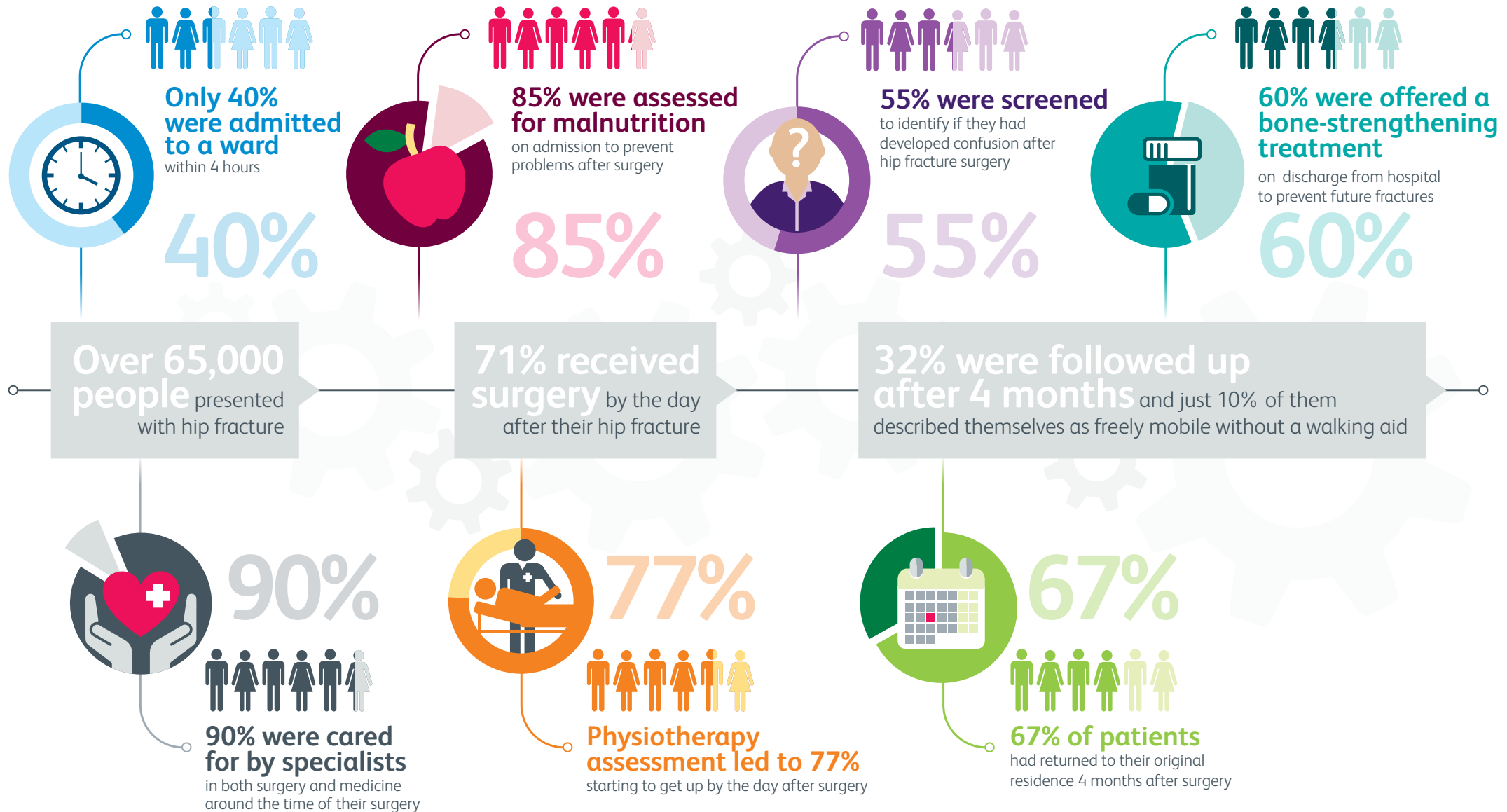
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Patients' experience of receiving hip fracture care in 2016

Hip fracture is the most common serious injury in older people and costs the NHS and social care £1 billion per year. In 2016, over 65,000 people aged 60 or older presented to 177 hospitals in England, Wales and Northern Ireland.



Introduction

The National Hip Fracture Database (NHFD) is a clinically led, web-based audit of hip fracture care that grew out of collaboration between the British Orthopaedic Association and the British Geriatrics Society and is now managed by the Royal College of Physicians (RCP).

The first NHFD record was entered in 2007, and on its tenth anniversary year (2017) the database now has half a million records. This represents a significant milestone for the data collectors who make the audit possible and it was celebrated in London at the regional meeting and tenth anniversary meeting which brought past and present contributors together to hear about the NHFD's achievements and activities.

Professor Chris Moran, national clinical director for trauma for NHS England said:

'We need to maintain the NHFD – it is one of the jewels in the crown of the national audits – it is looked upon with envious eyes, from around the world'.

All of the event presentations are available to download in video format from www.nhfd.co.uk.

This annual report provides an opportunity for us to examine trends in performance and outcome over the 10 years since the NHFD was established, and to review specific topics that require a whole year's data – such as our annual mortality outlier analysis.

In 2016 the NHFD pioneered the release of clinical audit data to the general public and made the data openly available so that clinical teams, hospital management and the public can all share the same access to live information about services in their area.

Nearly all the information included in this report will already have been made available to local teams through the website www.nhfd.co.uk developed with Crown Informatics.

References in the report have been replaced with thumbnail image links to URLs and are also available in [a separate document](#). Performance tables can also be accessed through icon links.

The screenshot shows the homepage of the National Hip Fracture Database (NHFD). The header features the Royal College of Physicians logo, the FFFAP logo, and the text 'The National Hip Fracture Database Part of the Falls and Fragility Fracture Audit Programme'. Below the header is a navigation bar with links: Home | Charts | Publications | Resources | Search, and a Login button.

The main content area is divided into several sections:

- News/Events:** A list of recent events and updates, including a North West regional meeting, easier time and date entry, a best practice chart update, contacting the support helpdesk, 10th Anniversary event video presentations, hip, hip, hooray - 10 years of NHFD!, Microsoft browser support withdrawn, and Archives.
- 2017 annual report:** A large banner featuring a photograph of an elderly woman. Text describes the report's focus on hip fracture care in 2016, mentioning that over 65,000 people aged 60 or older presented to 177 hospitals in England, Wales, and Northern Ireland. A 'Download report' button is visible.
- Performance and Outcomes:** A row of five thumbnail images with descriptions:
 - New: patients' experience of hip fracture care in 2016:** Shows a bar chart with a 77% figure.
 - New: online hospital dashboards plus progress and ratings:** Shows a line graph.
 - New: online assessment, surgery and outcome benchmarks:** Shows a bar chart.
 - Online charts for best practice, surgery and overall performance:** Shows a line graph.
 - 12 Questions - A guide for patients, their families and carers:** Shows a document icon.

The footer contains links for About, Terms and Conditions, Privacy Policy, Security, and Support, along with the text 'Powered by Crown Audit'.

All 177 eligible hospitals in England, Wales and Northern Ireland now regularly upload data. This report describes the process and outcome of care provided to 65,645 people presenting with a hip fracture in 2016 – nearly all the patients in these countries.

This total is slightly higher than last year (64,858). In spite of this, fewer patients are recorded to have died within 30 days of presentation (4,398 in 2016 *cf* 4,622 in 2015; 4,821 in 2014).

This gives an overall mortality rate of 6.7% for 2016. This is better than the 7.1% we reported in 2015 and continues the steady improvement documented since 2007 when it was 10.9%.

Key findings and recommendations

Leadership

A decade of NHFD evidence has shown how the hip fracture programmes recommended by NICE improve the quality and outcome of care. However, some hospitals still appear to have no clinical leadership for such an approach.

Monthly clinical governance meetings are central to any hip fracture programme. All units record surgeons as attending clinical governance meetings, but it is not clear whether these are focused on the hip fracture programme since only 75.8% include an orthogeriatrician and 63% an anaesthetist.

Data quality checks should be part of the clinical lead's role, but 22 units have no medical data quality review, including four in which the data is not collected by doctors or qualified nurses. In 40% of hospitals the work of clinical leads is not even recognised in their job plans.

- **Recommendation** – hospitals should ensure that the clinical leadership is in place to deliver and audit high-quality care
- **Recommendation** – local NHFD leadership should expand to include an anaesthetist as well as an orthopaedic surgeon and an orthogeriatrician

Inpatient falls

In 2015 we showed that 3.9% of hip fractures were sustained by hospital inpatients, with marked peaks of risk coinciding with morning and evening shift changes at times when patients need help getting up and using the toilet. This figure has risen to 4.1% in 2016.

- **Recommendation** – hospital managers and clinicians should examine how ward environments and staffing contribute to risk of inpatient falls, and monitor local inpatient hip fracture incidence as a patient safety metric in their trust

Prompt surgery

In the past year we have noted a further fall in the proportion of patients having surgery by the day after presentation, from 71.5% to 70.6%, the rate having peaked at 72.1% in 2014.

- **Recommendation** – monthly clinical governance meetings should review local NHFD data to identify and target common avoidable clinical and organisational reasons for delay in surgery

Fracture management

Since 2012 NHFD has shown a steady improvement in compliance with NICE guidance.

More patients now receive a nerve block as a part of anaesthesia, and from 2017 we are also recording use of nerve blocks in the emergency unit and wards to reduce discomfort and opioid side effects while awaiting surgery.

Rates of cementing of arthroplasties have improved, and more eligible patients now receive total hip replacement (THR). However, provision of THR remains well below that expected by NICE, as recently confirmed in its 2017 update of guidance on this topic.

Fewer patients with intertrochanteric fractures now receive sliding hip screws. In 2016 about 2,500 people received intramedullary nails for fractures in which NICE recommends extramedullary fixation.

- **Recommendation** – hospitals and commissioners should determine the reasons for failure to follow NICE guidance in their local area
- **Recommendation** – hospitals and commissioners should review their ability to deliver total hip replacement to appropriate patients, in the light of NICE's 2017 update on this topic

Rehabilitation

Comprehensive geriatric assessment is key to the effectiveness of hip fracture programmes, since improved multidisciplinary assessment will improve performance – hence the adoption of routine delirium, nutritional risk and physiotherapist assessments as part of Best Practice Tariff (BPT) this year. This report confirms that postoperative physiotherapist assessment is associated with earlier mobilisation.

However, the proportion of people being promptly admitted to a multidisciplinary hip fracture programme appears to have deteriorated – with just 39.9% of patients being admitted to an appropriate ward within 4 hours, compared with 43.9% in 2015.

- **Recommendation** – hospitals and commissioners should examine the reasons for delay in admission to beds where patients can receive coordinated multidisciplinary care from the hip fracture programme team who will be responsible for their whole stay

Follow-up

In addition to describing the care we provide, we should also consider our patients' views of the care they received and its outcome, which is most appropriately measured at 120 days when most people will have completed their rehabilitation and recovery.

A postal questionnaire or telephone consultation should determine patients' final residence, mobility and details of any reoperation, so that teams can understand the outcome of the care they have provided. At the same time, patients' need for additional support with bone medication can be considered.

This will also offer an opportunity for teams to survey patients' experience of hospital and post-hospital care, so that this can influence the future development of services.

- **Recommendation** – hospitals and commissioners should note the importance of supporting patients' persistence with bone health medication, as without it, further fragility fractures will not be avoided

Length of stay

Across the NHFD, mean length of stay has risen slightly (from 21.1 to 21.6 days), and in England it appears to have risen from 19.7 to 20.7 days. This may reflect improved capture of super-spell in some units (the overall length of NHS care following hip fracture), or may be a result of a general increase in demand for post-acute beds. This additional 1 day is equivalent to an extra 160 beds across hospitals in England.

For 17% of people the final discharge destination recorded by hospitals is still 'ongoing NHS care'.

- **Recommendation** – hospitals and commissioners should use the opportunity of the ongoing Physiotherapy Hip Fracture Sprint Audit to improve their understanding of patient flows through different local services and their ability to capture the whole NHS super-spell

Best practice

Just over 40% of patients are still not receiving the full package of care that attracts the £1,335 additional payment of BPT. Some of this shortfall was envisaged in the design of BPT, but the current financial climate should surely encourage units to address areas for improvement.

By halving the number of patients that miss out on BPT a typical unit seeing 360 patients a year could attract an additional £100,000 each year.

- **Recommendation** – hospitals should review why individuals fail to receive all of the elements of care that define a hip fracture programme since most cases fail on only one or two criteria

1. Improving the quality of hip fracture care

NICE quality standard QS16 (updated in 2016)

In 2016 NICE updated quality standard QS16 and released a new set of six quality statements to capture key aspects of care that all patients should expect after a hip fracture, though not all patients will be fit for surgery by the day after presentation.

NICE quality statements 2016	NHFD audit findings 2016
1. Adults with hip fracture are cared for within a hip fracture programme at every stage of the care pathway	88.7% of patients received perioperative orthogeriatric assessment – and 59.2% met all the criteria for BPT
2. Adults with hip fracture have surgery on a planned trauma list on the day of, or the day after, admission	Surgery on the day of or day after admission deteriorated from 71.5% in 2015 to an average of 70.6% for 2016
3. Adults with displaced intracapsular hip fracture receive cemented hemiarthroplasty or, if they are assessed as clinically eligible, a total hip replacement (THR)	Provision of THR to patients who meet NICE criteria has improved from 26.9% to 30.4% Cementing of arthroplasties has continued its steady improvement – to 86.1%
4. Adults with trochanteric fractures above and including the lesser trochanter receive extramedullary implants	In 2016 sites reported that 80.8% of people having surgery for A1/2 trochanteric fracture were treated with a sliding hip screw
5. Adults with subtrochanteric fracture are treated with an intramedullary nail	The use of nails for subtrochanteric fracture has increased further – to 84.1%
6. Adults with hip fracture start rehabilitation at least once a day, no later than the day after surgery	Mobilisation the day after surgery improved from 73.3% to 77.3%. We are looking to define 'rehabilitation' in a 2017 sprint audit.

NICE clinical guideline CG124 (updated in 2017)

The clinical guideline on the management of hip fracture in adults (CG124) was developed by NICE in 2011 and was central to the design and development of NHFD. It was updated in 2014, and again in 2017.

The recent update only considered changes in respect of the surgical management of displaced intracapsular fractures noting the need for further research in the management of undisplaced intracapsular fractures.

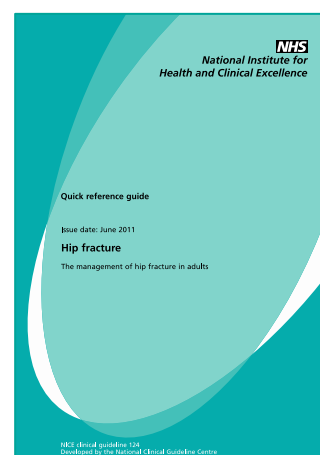
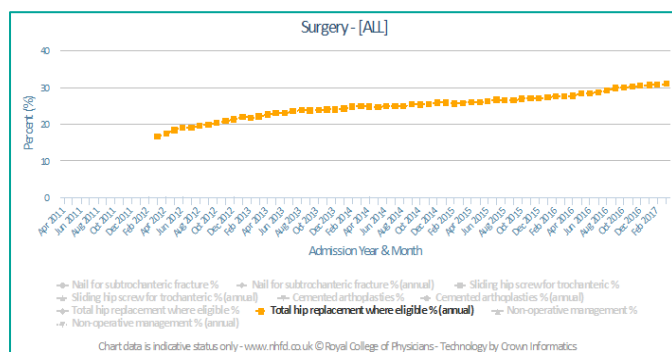


Image © NICE 2011



Source: National Hip Fracture Database 2017

This persistent poor compliance with NICE guidance led to an Oxford University study by Perry *et al* in the *BMJ* which was based on NHFD data from 2011–15. This examined the reasons for variation in practice between different hospitals, and showed how older and frailer patients were less likely to receive THR.

THR was also less likely to be offered to people of poorer socioeconomic status – a pattern for which it is difficult to imagine an acceptable justification.

An update of NICE CG124 was published in May 2017. This demonstrates the clinical and cost-effectiveness of THR for all patients with displaced intracapsular fracture who were cognitively intact, fit for anaesthesia and surgery, and previously mobile out of doors using no more than a stick.

Compliance with this updated NICE guidance will continue to be monitored in NHFD run charts of surgical performance in individual hospitals.

The 2017 update to NICE CG124 includes the following additions to guidance on surgical procedures:

1.6 Surgical procedures

- 1.6.1 Operate on patients with the aim to allow them to fully weight bear (without restriction) in the immediate postoperative period. **[2011]**
- 1.6.2 Offer replacement arthroplasty (total hip replacement or hemiarthroplasty) to patients with a displaced intracapsular hip fracture. **[2017]**
- 1.6.3 Offer total hip replacement rather than hemiarthroplasty to patients with a displaced intracapsular hip fracture who:
 - were able to walk independently out of doors with no more than the use of a stick **and**
 - are not cognitively impaired **and**
 - are medically fit for anaesthesia and the procedure. **[2017]**

The NHFD has documented progressive improvements in surgical care for displaced intracapsular fractures, including the provision of total hip replacement (THR), but in 2016 we still found that only 30.4% of patients who met the NICE eligibility criteria for THR actually received one.



Image © BMJ

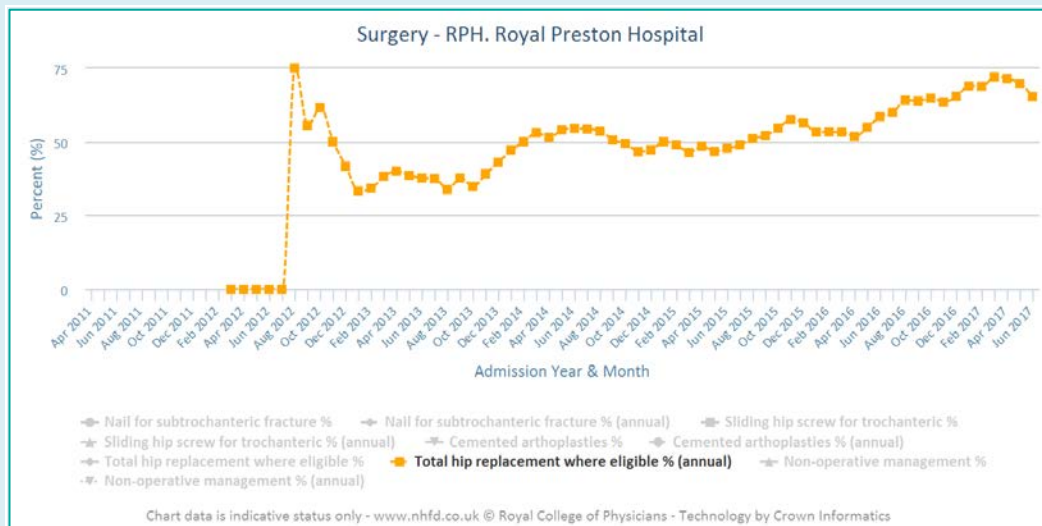
Royal Preston Hospital – Lancashire Teaching Hospitals NHS Foundation Trust

In February 2013 Royal Preston Hospital conducted an audit of total hip replacement (THR) for displaced intracapsular fracture. Data from the NHFD run chart indicates that in January 2013 the rate was 33.3% having fallen from a peak of 75% in August 2012. The audit showed that the trust was currently performing well below the national average.

The clinical director for orthopaedics and trauma implemented a quality improvement initiative to increase the THR rate for patients with displaced intracapsular fracture. The initiative included:

- increased awareness of the need to consider THR for displaced intracapsular fracture
- education for orthopaedic colleagues and junior surgical staff
- increased access to onsite provision of THR for all trauma patients
- THR kit made available in a laminar flow theatre at the trust's trauma site
- trauma theatre staff trained in THR surgery
- appointment of an orthogeriatrician
- appointment of clinical nurse specialist for fractured neck of femur
- rapid identification of patients suitable for THR
- improved communication within surgical teams to ensure patients are listed for surgery with an available hip surgeon
- patients receive THR as quickly as possible.

The initiative has seen the THR rate increase from 33.3% in January 2013 to 72% in March 2017 and 65.3% in June 2017.



Source: National Hip Fracture Database 2017

Best Practice Tariff

Individual hospitals' performance, including attainment of the criteria for Best Practice Tariff (BPT).

NHS England and NHS Improvement use BPT to incentivise key elements of patient care that have been identified as important in improving the quality and outcome of care after hip fracture.



Source: National Hip Fracture Database 2017

In particular, the additional payment can only be received if trusts provide assessment by a senior orthogeriatrician within 72 hours of a patient's first presentation with hip fracture. In this way BPT serves to pump-prime the recruitment and appointment of geriatricians to provide orthogeriatric support in all hospitals in England.

The impact of orthogeriatrician involvement is complex to define, since the clinical work of an orthogeriatrician is only one part of their role.

Much of the impact of these appointments results from their coordination and leadership of the wider multidisciplinary team and how orthogeriatricians help to ensure that others are able to work effectively with this frail and complex group of patients.

This was explored in a 2016 paper by Neuburger *et al* at the London School of Hygiene and Tropical Medicine.

This study used NHFD data to demonstrate how the increase in orthogeriatrician involvement between 2011 and 2013 led to a 3.4% reduction in relative risk of mortality after hip fracture – a figure equivalent to the avoidance of nearly 200 deaths across the 65,000 people presenting each year.

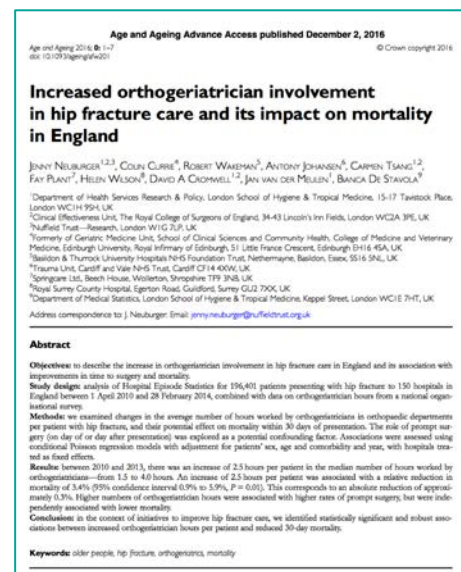


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Redefining best practice

Three of NHS England's and NHS Improvement's criteria for BPT have been discontinued this year. Repetition of the abbreviated mental test (AMT) cognitive assessment in the postoperative period was viewed as burdensome and inappropriate as a means of defining the incidence of postoperative delirium. Previous criteria including 'Admission using a joint surgeon – geriatrician assessment protocol' and 'Multidisciplinary rehabilitation assessment' proved insufficiently rigorous and objective, and achieved near 100% rates of compliance.

2017 changes to Best Practice Tariff

Existing BPT criteria that remain unchanged

- Time to surgery within 36 hours of presentation
- Assessed by a geriatrician within 72 hours
- Preoperative cognitive test using the AMT score
- Assessment for bone protection
- Specialist falls assessment

Criteria removed in April 2017

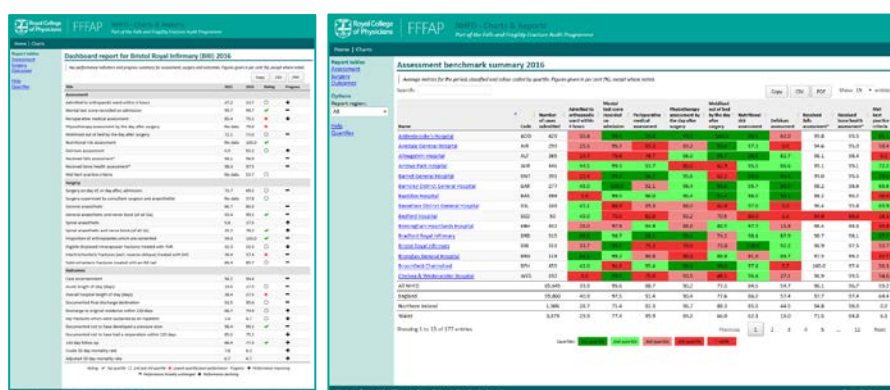
- Joint assessment protocol
- Postoperative repeat of AMT score
- Multidisciplinary rehabilitation assessment

New criteria since April 2017

- Nutritional assessment on admission
- Postoperative delirium assessment using the 4AT tool
- Assessed by a physiotherapist on the day of or the day after surgery

Three new, more objective criteria have been part of the NHFD dataset since 2016.

From 1 April 2017 these are required for a patient's care to be eligible for BPT in England.



Source: National Hip Fracture Database 2017

Individual hospital's figures for completion of these assessments are included in our hospital dashboards and in the [performance tables](#).

Assessment on admission

Numerous studies have identified the high prevalence of malnutrition among the frail and older people who typically present with hip fracture, and suggest that nutritional support will improve outcome.

In 2016 we asked for all new patients to be defined as 'malnourished', 'at risk' or 'normal'.

To avoid disrupting existing trust-wide nutritional assessment policies we asked units to make this assessment and categorisation using whichever nutritional risk tool is usual for their hospital. Our facilities audit asked which tools units were using for this assessment.

The majority (88%) of respondents described using the Malnutrition Universal Screening Tool (MUST), two used the Mini Nutritional Assessment (MNA) and one the WAASP tool. Sixteen others used locally developed tools.

In total, 54,878 patients (84.5%) underwent nutritional screening when they first presented, with just two hospitals failing to record any nutritional risk screening data in 2016.

Of the patients who were screened, 5.9% were categorised as 'malnourished', with 21.2% 'at risk' and 71.8% 'normal'. There was considerable variation between hospitals. Two of the locally

developed tools failed to identify any malnourished patients.

Even when we only consider the 131 units that used the MUST tool and reported numbers of patients in the three categories, the proportion identified as 'malnourished' varied from 0.7% to 24.5% across different hospitals (mean 5.6%). The proportion identified as 'at risk' or 'malnourished' varied from 2.0% to 83.3% (mean 23.3%) in these units (Fig 1).

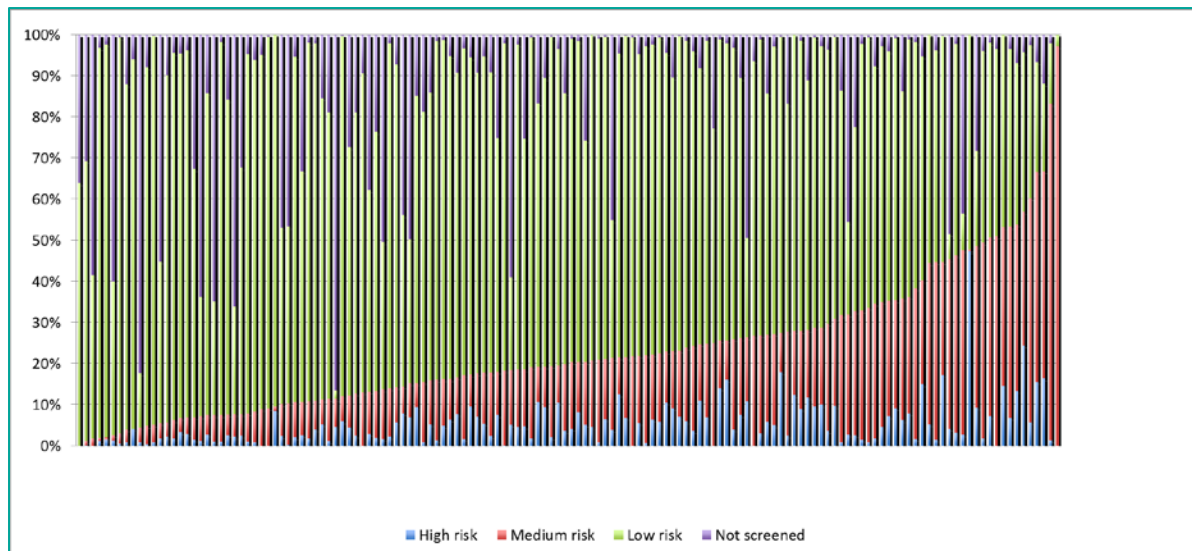


Fig 1 Summary of nutrition risk assessment results in 131 hospital units using the MUST tool

It is encouraging that clinical staff already recognise the importance of nutritional risk assessment and that such a high proportion of patients are receiving assessment when they present with hip fracture. From April 2017 BPT in England will provide further incentive for such assessment.

However, our 2016 facilities audit identified that dietitians currently only attend monthly clinical governance meetings in 10% of hospitals. Our analysis has raised concerns over the reliability of some locally validated tools, and there is clearly a need to improve the training offered to staff who are using the MUST tool in a number of hospitals.

Postoperative delirium assessment using the 4AT tool

Delirium is the commonest complication of surgery and anaesthesia in older people, but is often poorly recognised by the staff looking after such patients. In 2014 [Bellelli *et al* described the 4AT tool](#) – a simple and straightforward approach to delirium assessment.

To encourage routine delirium assessment, and to improve recognition and understanding of delirium, NHFD adopted the 4AT assessment as a new indicator in its dataset from 2016, asking that this be performed for all patients during the first week after surgery.

In 2016 all but 8% of hospitals recorded 4AT testing in at least some of their patients.

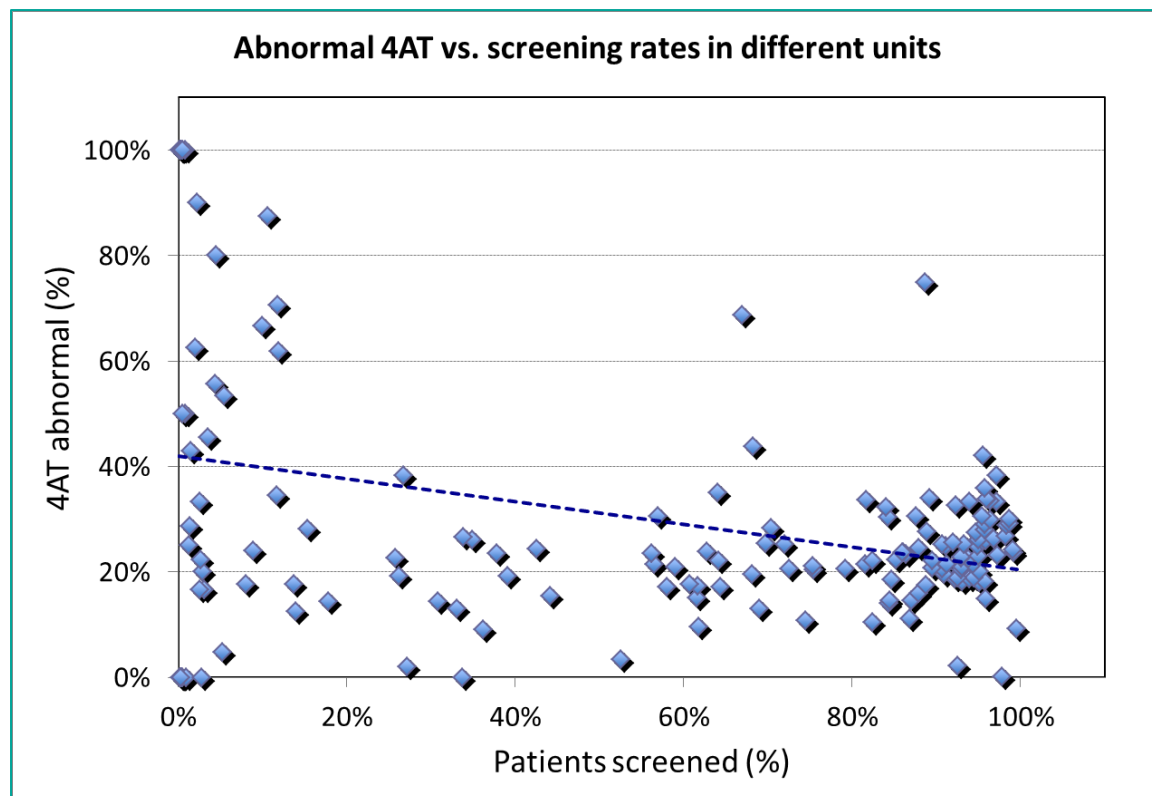


Fig 2 Rates of abnormal 4AT set against screening rates in different units

As a result, just over half (54.7%) of all patients were screened. The 4AT was abnormal (a score of 4 or more out of 12) in 23.6% of these patients, but in the first year after the introduction of this test reported rates of delirium varied hugely between units (from 0–100%).

Some units with relatively low rates of 4AT completion appeared to be preferentially recording delirious cases, which introduced a bias in overall figures. However, in units where more complete recording was achieved the rates of delirium identified with 4AT clustered around a more reliable figure of 20–25% (Fig 2).

Introduction of a national programme for delirium screening will face a steep learning curve whatever tool is used. However, the 4AT is a validated tool which has proven acceptable to most units, and when routinely performed suggests delirium occurs in nearly a quarter of patients.

The hypoactive form of delirium is particularly poorly recognised and carries a poorer prognosis. From 2017 NHFD is recording the individual components of 4AT separately, which will allow us to examine the implication of reduced alertness after surgery for hip fracture. The quality of assessments should be addressed by local quality improvement initiatives.

Physiotherapist assessment after surgery

Much attention has focused on prompt surgery for patients with hip fracture. The purpose of this is to relieve pain and restore mobility, so NHFD monitors whether patients are mobilised from bed by the day after surgery. Successful mobilisation is not just about physiotherapy, and requires effective multidisciplinary working to optimise postoperative protocols for pain control, fluid resuscitation and blood transfusion.

In 2016 we recorded whether patients received physiotherapy assessment by the day following hip fracture surgery, and whether they were successfully ‘mobilised’ by that day – standing with or without aid, or being hoisted to sit out of bed.

Three-quarters (77.3%) of all patients were ‘mobilised’ by the day after surgery. This is slightly better than the 73.3% recorded in 2015, but still means that a quarter (22.7%) were not mobilised.

Some patients (4.3%) were mobilised by other staff, but most of these (63.6%) had received physiotherapy assessment. Patients who did not receive physiotherapy assessment were three times more likely not to be mobilised.

Across NHFD a total of 9.8% of all patients were not assessed by a physiotherapist (11.6% if we include those where this information was not recorded), and the majority of these were not mobilised by the day after operation.

As a result, 6.6% of all patients were neither assessed nor mobilised. This figure varied dramatically between units – from 0% in some units, to over a quarter of patients in a few hospitals (Fig 3). This demonstrates the positive impact of physiotherapy assessment in promoting prompt mobilisation and rehabilitation.

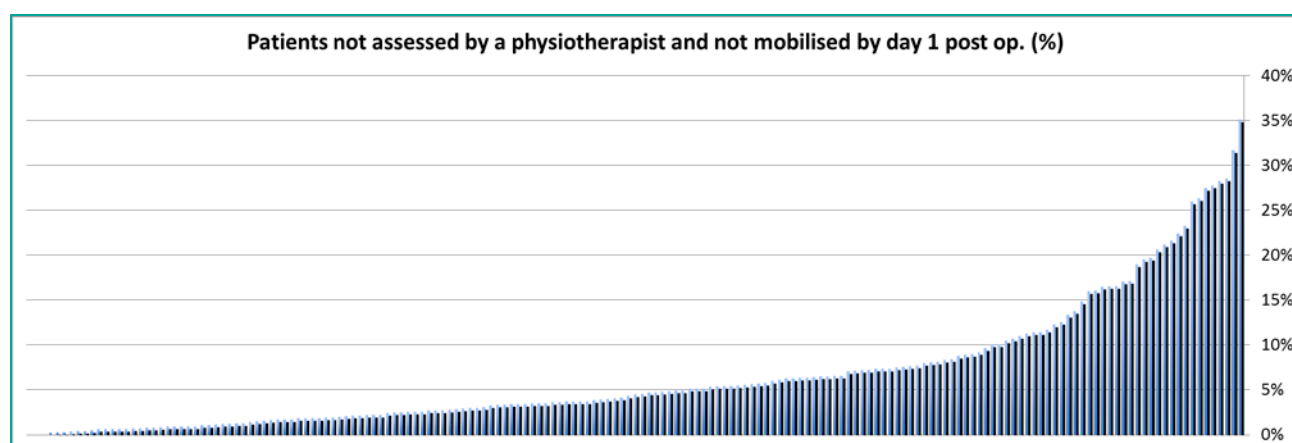


Fig 3 Hospitals ranked to show percentage of patients not assessed by a physiotherapist and then not mobilised by day 1 post-op

Our [2016 survey of facilities audit](#) describes service organisation in 171 contributing units.

All of these hospitals had access to physiotherapy 5 days a week, but a 7-day service was only available in 65% of hospitals.

From April 2017 failure to provide postoperative physiotherapist assessment will lead to trusts in

England losing £1,335 of BPT per case. This provides a powerful financial incentive to improve the provision and coordination of 7-day physiotherapy support to this patient group.

NHFD’s ongoing sprint audit with the Chartered Society of Physiotherapy seeks to further investigate the quality and intensity of physiotherapist input in the days following surgery and to help us understand the reasons why individual patients fail to be mobilised.

Hospital	HospitalName	Orthopaedic Clinical Lead	Orthogeriatric clinical lead	Is the role of NHFD lead clinician reflected in your job plan?	Are NHFD data regularly disseminated to staff at ward level	Are NHFD data regularly disseminated to staff at Trust Board level	Are NHFD data regularly disseminated to staff at Directorate level
ADD	Addenbrooke's Hospital	Yes	Yes	Yes	Yes	Yes	Yes
AEI	Royal Albert Edward Infirmary	Yes	Yes	Yes	Yes	Yes	Yes
AJR	Airedale General Hospital	Yes	None	No	Yes	Yes	Yes
ALT	Altnagevelin Hospital	Yes	Yes	Yes	Yes	Yes	Yes
BAR	Barnsley District General Hospital	Yes	Yes	Yes	Yes	Yes	Yes
BAS	Basildon Hospital	Yes	Yes	No	Yes	Yes	No response
BAT	Royal United Hospital Bath	None	None	No	Yes	No response	No response
BED	Bedford Hospital	Yes	Yes	Yes	No response	Yes	No response
BHM	Broomfield Chelmsford	Yes	Yes	Yes	No response	Yes	Yes
BLA	Royal Blackburn Hospital	Yes	Yes	Yes	No response	Yes	Yes
BNT	Barnet General Hospital	Yes	Yes	Yes	Yes	Yes	Yes
BOL	Royal Bolton Hospital	Yes	Yes	Yes	Yes	Yes	Yes
BRD	Bradford Royal Infirmary	Yes	Yes	Yes	Yes	Yes	Yes
BRG	Bromsgrove General Hospital	Yes	Yes	Yes	No response	Yes	Yes
BRI	Bristol Royal Infirmary	Yes	Yes	Yes	Yes	Yes	Yes
BRO	Princess Royal University Hospital (Bromley)	Yes	Yes	No	Yes	No response	Yes

Source: National Hip Fracture Database 2017

In 2016 Queen Alexandra Hospital, Portsmouth reported that 97.7% of patients were mobilised by the day after surgery

How did we achieve this?

In 2013/14 we audited the impact of enhancing therapy input to hip fracture patients, proposing that this would improve how quickly they attained the independence needed to leave hospital safely, reduce the number requiring transfer to inpatient rehabilitation and so reduce length of stay.

The physiotherapy team was doubled, with additional staff at bands 6, 5, and 3, along with an additional band 6 occupational therapist.

Length of stay was reduced by 2.2 days, more patients were discharged home from the acute ward, fewer to a specialist rehabilitation ward, and fewer needed care home placement.

A business case based on these positive results means that this enhanced therapy team has now been formally established.

All post-operative patients are assessed by a physiotherapist, 7 days per week, and mobilised unless their medical condition dictates otherwise. In our experience it is rarely the case that the benefits of mobilisation are outweighed by other medical issues.

2. Understanding the organisation of hip fracture care

Hip fracture and the working week

New presentations

A total of 65,645 patients presented to 177 hospitals during 2016. The total number of patients presenting on weekdays (48,176) was 11.6% higher than we recorded at the weekend; 8,803 on Saturday and just 8,460 on Sunday.

This pattern would not be apparent to staff dealing with smaller numbers of patients in individual hospitals.



Fig 4 Weekday of presentation against place of residence

On average, 13% of all new patients presented on a Sunday compared with the 14.3% that we would expect if the presentations were evenly distributed across the week. This figure varied between 7.3% and 20% in different hospitals across the country.

The same pattern was seen among people admitted from their own home or from care homes, and among those who suffered their hip fracture following admission to hospital.

Since these findings might result from poorer capture of patients presenting at weekends, we approached the 20 units in which the weekend pattern was most marked, to question whether this might reflect problems with data quality at weekends. All described rigorous processes to identify new cases, and none accepted that weekend patients would be missed.

To further cross-check this unexpected result we re-examined NHFD data for 2015, and looked at independently collected Hospital Episode Statistics (HES) data for the same year.

Both confirm this finding, with HES showing just 12.3% of all patients presenting on a Sunday.

This pattern across the week contributes to our observation that **half of all new patients with hip fractures present between 8am and 8pm Monday to Friday**. This will be of particular interest to those responsible for organising patients' admission assessment, anaesthesia and surgical care.

Care and outcomes across the week

Suggestions of poorer quality of healthcare at weekends have received much attention in recent years, leading to claims that admission at a weekend might lead to poorer outcomes.

For many medical and surgical conditions there is a potential bias in such analyses – more seriously ill patients may have to present at the weekend, while others may be able to delay presentation until the working week. This will not be a factor among patients with hip fracture, so NHFD is ideally placed to investigate such a 'weekend effect'.



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Sayers *et al* at the University of Bristol published a major study in 2017 using NHFD data for 241,446 patients who were admitted in the years 2011–14.

This found no evidence of a weekend effect; indeed patient mortality was 5.6% lower if people presented at the weekend, and their 30-day mortality was the same as that for people who presented on weekdays.

However, the study noted that 30-day mortality was 9.4% higher for people who had surgery on a Sunday, 17.4% higher if people were discharged out-of-hours and 51.5% higher for the very small numbers of people who were discharged from hospital on a Sunday.

These observations will be a stimulus to further research, in view of their implications for the organisation of hip fracture services. We have already followed up the 2011–14 study, using NHFD data for 2016 to describe current patterns of care, and how these varied across the days of the week on which a patient presented, or on which they received surgery.

Patients who initially presented on Friday and Saturday were less likely to receive surgery by the following day and less likely to be seen by an orthogeriatrician before surgery, though they still received perioperative orthogeriatrician assessment within 72 hours (Table 1).

Table 1 Patterns of admission across the week

Patterns across the week for 65,489 patients who had hip fracture surgery in 2016								
	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Overall
People presenting on this day:								
N	9,445	9,742	9,602	9,578	9,845	8,812	8,465	
%	14%	15%	15%	15%	15%	13%	13%	
Orthogeriatrician review before surgery	70%	70%	70%	74%	37%	35%	63%	60%
Operation with cons. surgeon and anaesthetist	56%	56%	56%	56%	54%	54%	54%	55%
Operation by the day after presentation	72%	72%	71%	73%	69%	64%	71%	70%
People having surgery on this day:								
N	9,464	9,345	9,536	9,165	11,058	8,813	8,108	
%	14%	14%	15%	14%	17%	13%	12%	
Orthogeriatrician review before surgery	63%	72%	72%	71%	66%	44%	25%	59%
Operation with cons. surgeon and anaesthetist	56%	58%	57%	58%	50%	54%	53%	55%
Physio assessment by the day after surgery	93%	93%	93%	93%	76%	81%	92%	89%
Mobilised from bed by the day after surgery	80%	81%	81%	80%	73%	73%	80%	78%

Patients presenting on Friday, Saturday and Sunday were only slightly less likely to have surgery with consultant anaesthetists and surgeons. Consultant-led anaesthesia and surgery was evenly distributed across the week, apart from Fridays – the day on which the most hip fracture operations were undertaken (17% of all weekly operations).

Delay in mobilisation from bed was noted after surgery on a Friday and Saturday, and this appears to reflect reduced weekend availability of physiotherapists – an issue that we will be monitoring following the addition of physiotherapist assessment to BPT from April 2017.

Surgical care

Non-operative management

NICE guidance CG124 states that 'If a hip fracture complicates or precipitates a terminal illness, the multidisciplinary team should still consider the role of surgery as part of a palliative care approach', and it is now generally accepted that conservative treatment is only appropriate for patients who present late with impacted subcapital fractures.

Rates of non-operative treatment remain low, averaging 2.2% across NHFD in 2016.

The highest rates of non-operative management were seen in Bronglais Hospital, Aberystwyth (10%) and Glan Clwyd Hospital (7.8%), both of which had also reported figures greater than 5% in 2015.

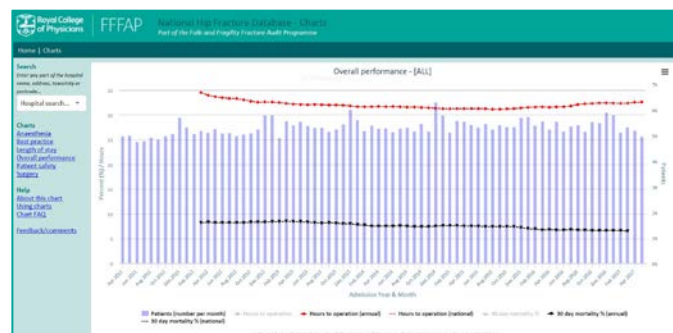
Eight other hospitals reported that over 5% of people did not receive surgery (Queen's Hospital, Burton; Southport and Formby District General; Rotherham General; Manchester Royal Infirmary; Princess Royal Hospital, Telford; Nevill Hall Hospital, Abergavenny; St George's, Tooting; and North Manchester General).

All should ensure that their reasons for conservative management are clinically justifiable.

Delay to theatre

The majority of patients (70.6%) received surgery by the day following presentation with hip fracture as recommended by NICE. Data on average time to theatre for individual hospitals units can be accessed on the NHFD website.

Half of the remaining patients experienced a delay while their orthopaedic diagnosis was clarified, or while they were being medically investigated and optimised.



Source: National Hip Fracture Database 2017

There is clearly potential for teams to improve these figures by the development of protocols to streamline management of common clinical issues. Reversal of anticoagulation is an increasingly difficult issue as the use of direct acting oral anticoagulant (DOAC) becomes more widespread.

Our facilities audit questioned whether units had protocols to guide management of DOACs. Most units which replied positively only referred to generic guidance on use of these drugs, with limited guidance on decision making in the perioperative period for frail, often renally impaired and underweight hip fracture patients. We welcome examples of local protocols to add to those already available in the www.nhfd.co.uk resources section.

For the other half of patients the delay was not clinically justifiable – reflecting administrative delays and pressures on theatre lists (Table 2).

Table 2 Reasons for delay in surgery

Reason for surgery being delayed more than 36 hours	
Administrative/logistic – awaiting space on theatre list	35.7%
Administrative/logistic – cancelled due to list overrun	6.4%
Awaiting medical review/investigation or stabilisation	31.6%
Awaiting orthopaedic diagnosis/investigation	6.8%
Other	6.1%
Unknown	13.4%

If hospitals were organised so as to eliminate the administrative and logistic factors that delay surgery then 81.7% of patients could have their operations on the day of or day after admission – a figure close to the 85% envisaged when BPT was first established.



Source: National Hip Fracture Database 2017

Fracture and operation types

The proportion of people having a total hip replacement for a displaced intracapsular fracture continues to improve – up from 26.9% to 30.5% since last year. National and local trends in surgical care can be viewed on the NHFD website.

In 2009 we reported that 55.6% of arthroplasties were cemented. This year's figure of 86.1% shows NICE guidance on use of cemented implants is increasingly being followed. However, five hospitals (Warwick; North Middlesex University Hospital; Whittington; Royal Berkshire, Reading; and Barnet General) reported that fewer than 10% of their arthroplasty procedures were cemented.

Table 3 Operations by fracture type

	Intracapsular			Intertrochanteric			Subtroch.	All
	Displaced	Undisplaced	Unknown	Grade A1/A2	Grade A3	Unknown		
Internal fixation								
Sliding hip screw	2.2%	2.3%	0.1%	24.3%	0.7%	1.8%	0.7%	32.1%
IM nail (long)	0.1%			2.3%	1.4%	0.5%	4.7%	9.0%
IM nail (short)				1.7%	0.4%	0.3%	0.2%	2.8%
Cannulated screws	0.7%	2.1%		0.1%				3.0%
Arthroplasty								
Bipolar hemi (cemented)	7.0%	0.7%	0.1%			0.1%		7.9%
Bipolar hemi (uncemented - HA coated)	0.9%	0.1%						1.1%
Bipolar hemi (uncemented - uncoated)	0.3%	0.1%				0.1%		0.5%
THR (cemented)	4.7%	0.4%						5.2%
THR (uncemented - HA coated)	0.6%							0.7%
THR (uncemented - uncoated)	0.5%	0.1%						0.6%
THR hybrid	1.2%	0.1%						1.3%
Unipolar hemi (cemented)	26.4%	2.5%	0.2%	0.2%				29.3%
Unipolar hemi (uncemented - HA coated)	1.2%	0.1%						1.4%
Unipolar hemi (uncemented - uncoated)	2.4%	0.3%						2.8%
No operation performed	0.9%	0.6%		0.4%		0.1%	0.1%	2.2%
Other	0.1%			0.1%			0.1%	0.3%
All	49.2%	9.4%	0.6%	29.3%	2.5%	3.0%	5.9%	100%

Intramedullary nailing of subtrochanteric fractures has also improved – from 66.7% in 2012 to 84.1% in 2016.

However, for one aspect of surgical care the trend remains downwards. NICE CG124 recommends that A1 and A2 intertrochanteric fractures should be fixed using a sliding hip screw (SHS).

Since 2012 use of SHS fixation has fallen from 84.8% to 80.0% of all intertrochanteric fractures. We now ask hospitals to subtype their intertrochanteric fractures. This has been achieved in the majority (92.2%) of cases and 80.8% of operations for A1/A2 fractures used an SHS and 19.2% an intramedullary nail. This pattern is counter to NICE CG124 and may reflect surgeon preference and an increasing confidence in the use of nails.

Service organisation and clinical governance

All but six hospitals (Bassetlaw Hospital, Worksop; Diana Princess of Wales, Grimsby; Luton and Dunstable; Leicester Royal Infirmary; Queen's Hospital, Romford; and Scunthorpe General Hospital) completed our annual 'facilities

Hospital	HospitalName	Orthopaedic Clinical Lead	Orthogeriatric clinical lead	Is the role of NHFD lead reflected in your job plan?	Are NHFD data regularly disseminated to staff at ward level?	Are NHFD data regularly disseminated to staff at Trust Board level?	Are NHFD data regularly disseminated to staff at Directorate level?
ADD	Addenbrooke's Hospital	Yes	Yes	Yes	Yes	Yes	Yes
AEI	Royal Albert Edward Infirmary	Yes	Yes	Yes	Yes	Yes	Yes
AIR	Airedale General Hospital	Yes	None	No	Yes	Yes	Yes
ALT	Altnagegin Hospital	Yes	Yes	Yes	Yes	Yes	Yes
BAR	Barnsley District General Hospital	Yes	Yes	Yes	Yes	Yes	Yes
BAS	Basilston Hospital	Yes	Yes	No	Yes	Yes	No response
BAT	Royal United Hospital Bath	None	None	No	Yes	No response	No response
BED	Bedford Hospital	Yes	Yes	Yes	No response	Yes	No response
BFH	Broomfield Chelmsford	Yes	Yes	Yes	No response	Yes	Yes
BLA	Royal Blackburn Hospital	Yes	Yes	Yes	No response	Yes	Yes
BNT	Barnet General Hospital	Yes	Yes	Yes	Yes	Yes	Yes
BOL	Royal Bolton Hospital	Yes	Yes	Yes	Yes	Yes	Yes
BRD	Bradford Royal Infirmary	Yes	Yes	Yes	Yes	Yes	Yes
BRG	Bronglais General Hospital	Yes	Yes	Yes	No response	Yes	Yes
BRI	Bristol Royal Infirmary	Yes	Yes	Yes	Yes	Yes	Yes
BRO	Princess Royal University Hospital (Bromley)	Yes	Yes	No	Yes	No response	Yes

Source: National Hip Fracture Database 2017

audit' to define service organisation. [Results for individual hospitals](#) can be accessed via the NHFD website.

From the outset, NHFD was envisaged as being carried out in real time, using routine clinical assessment data collected as part of a patient's care, so that if care gaps were identified the first person to benefit would be the person receiving that care.

Inpatient data is still primarily collected by clinical staff in 89% of units. Follow-up data is collected by administrative and audit staff in 39% – often using a postal questionnaire.

The way in which hip fracture care is organised has changed little, but the number of units describing a 'traditional model' of orthopaedic care fell again; from eight last year to six this year.

Orthogeriatrician input varies considerably – hospitals reported an average of 21.3 hours of consultant and 16.1 hours of non-consultant (staff grade, associate specialist or speciality trainee) time per week. Orthogeriatrician rounds only reviewed patients with hip fracture in 57% of units, older people with other injuries in 35% and any orthopaedic patients in 5%. Just 3% of units described no regular rounds.

The multidisciplinary nature of care is exemplified by attendance at various meetings: The first occasion for MDT discussion is the daily trauma meeting. Orthopaedic consultants were almost always present, with nurses attending in 86%, anaesthetists in 47%, physiotherapists in 42%, and orthogeriatricians in just 37% of units.

Weekly ward-based meetings were led by orthogeriatricians in 87% of units, and usually attended by physiotherapists (97%), nurses (96%) and occupational therapists (92%). Consultants in orthopaedics attended in 15% of hospitals, anaesthetists in 4%, social workers in 42% and dietitians in 10%. Community rehabilitation staff attended in 13% (over twice the figure we reported last year), and orthopaedic directorate managers in 4%. Psychiatry was rarely represented (4%).

Table 4 Topics discussed at governance meetings

Topic	% of meetings
Mortality	96%
Delay to surgery	84%
Critical incidents	80%
Patient safety	79%
Clinical quality	75%
Length of stay	68%
Reoperations	67%
Pressure ulcers	66%
Complaints	61%
Inpatient falls	60%
Delayed discharges	49%
Ward housekeeping	32%

Most hip fracture units have a monthly governance meeting where a wide variety of matters may be discussed.

These meetings generally have a broad MDT representation, including consultants in orthopaedics in 99% of units, orthogeriatrics in 76%, and anaesthetics in 63%. Nurses attend in 92%, physiotherapists in 64%, occupational therapists in 48%, dietitians in 10%, and social workers in 4%. There are representatives from A&E in 29%, from community rehabilitation in 11%, and from psychiatry in 1%. Directorate managers attend in 71% of units.

In the last 2 years the NHFD website has dramatically improved its provision of live data on performance and outcome that is easy to access and to use to inform these clinical governance meetings. It is vital that hospitals promote and support these meetings and that they are tasked, and empowered, to drive improvement in the quality of patient care.

3. Understanding hip fracture outcome

Length of stay

Past NHFD annual reports have presented length of stay (LOS) data as mean figures, since these are readily understood by all readers, and will allow hospital staff to estimate bed-occupancy figures.

The overall figure for mean trust LOS rose to 21.6 days in 2016, compared with 21.1 days in 2015.

In this year's report we are also presenting median figures, as a better measure of how long a patient might typically expect each stage of their care to last (Table 5).

Table 5 Length of hospital stay by nation

	England Mean (Median)	Wales Mean (Median)	N Ireland Mean (Median)	All NHFD Mean (Median)
Time to orthopaedic ward (hrs)*	11.3 (4.6)	13.0 (5.8)	10.4 (5.6)	11.3 (4.7)
Time to operation (hrs)	32 (23.3)	37.2 (26.8)	54.2 (46.3)	32.9 (24.1)
Acute ward LOS (days)	16.4 (12)	20.0(14)	13.3 (11)	16.6 (12)
Overall trust LOS (days)	20.7 (15)	34.1 (22)	23.4 (16)	21.6 (15)

*Excludes patients who never reached an orthopaedic or orthogeriatric ward

The profile of length of stay in different nations is therefore more comparable than their mean LOS figures would suggest – with the commonest LOS being 7–10 days – but a tail of longer inpatient care in Wales has led to a higher median LOS and a much higher mean LOS (Figure 5).

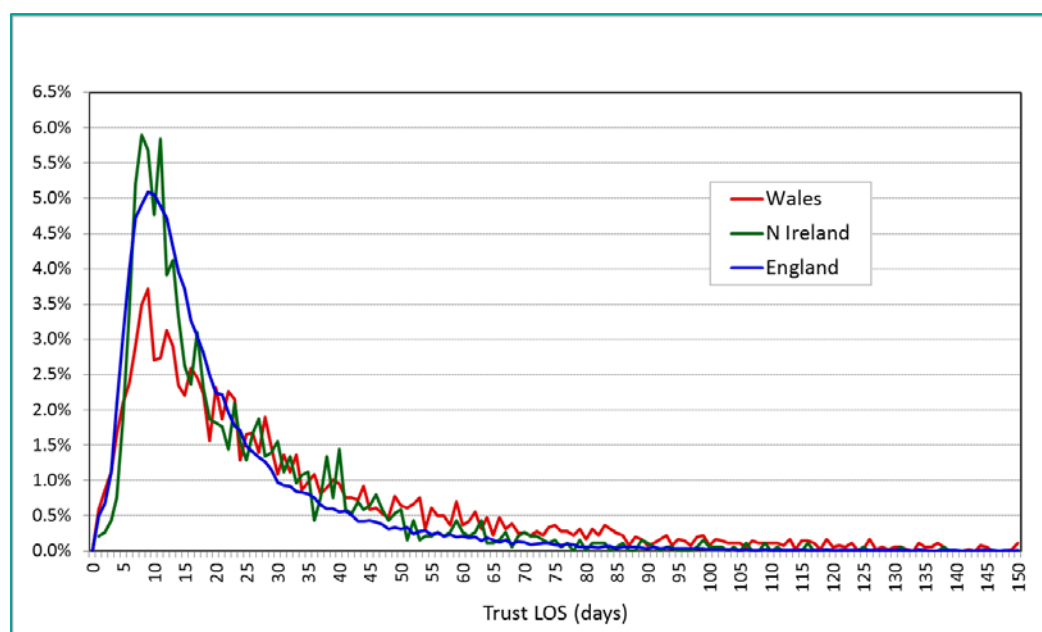


Fig 5 Overall trust length of stay profile by nation

This pattern is consistent with our previous descriptions of more complete capture of LOS in Wales. Data from the NHFD and HES leave considerable uncertainty over later stages of super-spell with the variety of post-acute rehabilitation options available in England, and the ‘hub and spoke’ model of services in Northern Ireland (Table 6).

Table 6 Destinations recorded for final discharge from NHFD

	England	Wales	N Ireland	All NHFD
Own home/sheltered housing	51%	64%	49%	52%
Residential care	11%	8%	3%	11%
Nursing care	1%	1%	0%	1%
Ongoing NHS care:	17%	4%	21%	17%
Acute hospital	1%	1%	1%	1%
Rehabilitation bed in another trust	11%	3%	20%	11%
Rehabilitation in NHS-funded care home	5%	0%	1%	5%
Other/unknown	3%	1%	0%	2%
Died	8%	12%	6%	8%
	59,860	3,879	1,906	65,645

A further factor limiting our understanding of the overall NHS length of stay or ‘super-spell’ after hip fracture is the availability of beds in independent providers. We have little understanding of how long patients spend in such settings, or of consequent cost.

Work with the Chartered Society for Physiotherapy for the 2017 *Physiotherapy Hip Fracture Sprint Audit* (PHFSA) has identified that clinical teams often have no real understanding of whether patients sent to these and other post-acute beds will receive therapy to improve their independence, or simply to convalesce while discharge arrangements are finalised.

In this year's facilities audit we asked units to define their expectations of the care their patients would receive after transfer (Table 7), but we await the PHFSA results to establish the actual therapy provided in such settings.

Table 7 Available options for acute hospital discharge

Options after acute hospital discharge	% of hospitals with access
Continued rehabilitation – care home	62%
– another trust	59%
– independent provider	9%
Convalescence and discharge planning – care home	45%
– another trust	28%
– independent provider	4%
No rehabilitation beds	4%

The availability of physiotherapy in care homes is also a factor that may influence decisions over the appropriateness of early discharge of patients to their original care home or to a new placement. Only 70% of hospitals had access to care home physiotherapy follow-up – [a care gap that has previously been noted](#), and which runs counter to the NICE recommendation that such care should be available.

120-day follow-up

NHFD uses death registration data in follow-up of 30-day mortality, but 120-day follow-up is a more relevant end point for definition of the final outcome of patients' rehabilitation.

In 2016 hospitals collected 120-day data for 18,142 patients or 31.7% of all NHFD cases.

Craigavon and Nevill Hall hospitals submitted 120-day follow-up data for over 90% of all patients.

Another 16 hospitals successfully performed follow-up for over three quarters of their patients (Ulster; Royal Devon and Exeter; Royal Victoria, Belfast; Queen Alexandra, Portsmouth; Worthing Hospital; Royal Preston; Southmead; York District; Royal Albert Edward Infirmary, Wigan; Poole General; Royal Blackburn; Cumberland Infirmary, Carlisle; Bristol Royal Infirmary; Royal United Hospital, Bath; Salisbury; and Noble's Hospital, Isle of Man).

Bone protection medication

Assessment for bone protection medication is crucial if patients' risk of future fragility fracture is to be reduced. Patients are now routinely considered for this, and 97% had an assessment recorded.

The NHFD record of bone protection does not accept calcium or vitamin D as sufficient, and over 60% were discharged on some form of antiresorptive or bone-stimulating medication.

21.6% of patients were recorded as having been assessed as inappropriate for bone protection medication. This figure is higher than the 17.9% we reported last year and the 16.0% in 2014, and it is a particular concern that in 14 hospitals (Nobles Hospital, Isle of Man; Huddersfield Royal

Infirmaries; Royal Victoria Hospital, Belfast; Cumberland Infirmary, Carlisle; Royal Lancaster Infirmary; Poole General Hospital; East and North Herts Hospital; Pinderfields General, Wakefield; Royal Blackburn Hospital; Medway Maritime Hospital, Gillingham; Salford Royal Hospital; Leighton Hospital, Crewe; York Hospital and Princess Alexandra, Harlow) over half of all patients were judged as inappropriate for this form of secondary prevention. We have contacted all of these units to clarify the appropriate coding for these data, and to support a number in moving towards the more active assessment and treatment protocols reported by the majority of other hospitals.

Half of all patients (49.7%) were discharged taking an oral bone treatment, a further 8.3% receiving some form of injectable medication, and an additional 17.4% were referred on for further DXA or outpatient assessment before deciding on such treatment (see Table 8).

Table 8 Bone protection medication at discharge

Action taken	
Assessed but no bone protection medication needed or appropriate	21.6%
Oral medication - continued from pre-admission	7.3%
- started on this admission	42.4%
Injectable medication - continued from pre-admission	0.9%
- started on this admission	7.4%
No treatment, pending DXA scan or bone clinic assessment	17.4%
No assessment or no action taken	2.9%

Follow-up of patients is of particular importance in respect of bone protection medication, since it is well recognised that without follow-up, patients will often fail to continue taking osteoporosis treatment – meaning that they remain at increased risk of further fragility fractures.

Persistence with bone protection at 120 days was recorded as ‘unknown’ for 13% of the 18,142 patients, but 12,536 (69%) indicated they were still taking the same medication as on discharge, 5% had changed to an alternative form and 13% had stopped such medication.

These figures are encouraging, but the incompleteness of these data should be recognised since persistence rates are likely to be poorer among the patients who did not respond, could not be contacted, and in hospitals which have not developed any form of follow-up.

Restoration of mobility

120-day follow-up of mobility found only 10% (1,873 out of 18,142) of people describing themselves as ‘freely mobile without aids’, compared with 37% who had this level of mobility before presenting with a hip fracture.

A total of 35% said that they never went out of doors, but retained some indoor mobility (*cf* 25% pre-fracture), while 9% said that they were completely immobile (*cf* 1.3% pre-fracture). 19% said that they now needed one aid, and 17% two aids or a frame to mobilise out of doors. Mobility was unknown for 9% of people who were followed up.

Residential status

Follow-up data on mortality is complex to analyse since hospitals will check and record which patients have died, even before attempting follow up. As a result, recorded deaths at 30 or 120 days will be disproportionately high – a source of bias that is one reason for our use of independent Office for National Statistics (ONS) death registration data in our 30-day mortality outlier analysis.

Bias may also affect whether 120-day follow-up details are returned for patients living in their own home or in care homes. This should be taken into consideration when noting that available 120-day follow-up data suggests that two-thirds (65%) had returned to their own home or sheltered accommodation, compared with the 81% living at home before their hip fracture.

Around 4% of patients were still in a hospital or rehabilitation unit at 120 days, or had been readmitted. The remaining quarter were living in care homes at 120 days, comprising 12% in nursing homes (*cf* 8% before their hip fracture) and 13% in residential care (*cf* 11% pre-fracture).

People presenting with a hip fracture place a high value on returning 'home' to their original residence – be that to their own home, sheltered accommodation or care home.

Individual units can examine how well they are achieving this objective for their patients by combining data on trust discharge destination with the results of any 120-day follow-up (Figure 6).

In 2016 we found that two-thirds (66.1%) of people had returned to their original residence by 120 days – though this figure is likely to be an underestimate for units which discharge a large number of cases to rehabilitation elsewhere and fail to follow up their final outcome.

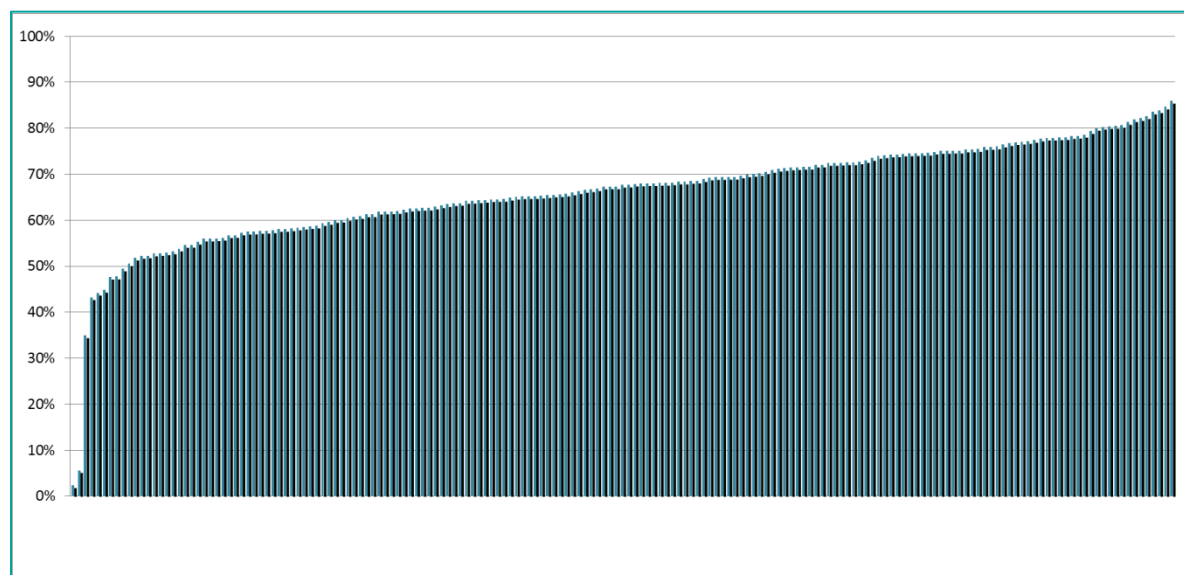


Fig 6 Proportion of patients known to have returned to their original residence by 120 days for individual hospital units

Reoperation

The development of effective surgical treatment for hip fracture has been a huge success offering excellent immediate relief of pain and the potential for people to return to mobility.

However, if surgical complications do arise they can be very disabling and difficult to treat, and studies considering quality of life after hip fracture tend to be heavily influenced by the enormous impact of surgical complications on a small number of individuals.

With 120-day follow-up collected for just 28% of NHFD cases we cannot provide an accurate description of overall reoperation rates. However, 554 reoperations were recorded, which might suggest around 2,000 reoperations if scaled up across all NHFD presentations in 2016.

We only record the most significant reoperation for each patient. Table 9 gives a picture of these for the 554 individuals. Washout or wound debridement made up a quarter of the recorded procedures, and relocation of dislocated arthroplasty around one in six.

Table 9 Recorded reoperations at 120 days

Procedure	Number	Percentage
Conversion to hemiarthroplasty	32	6%
Conversion to THR	71	13%
Girdlestone/excision arthroplasty	57	10%
Implant removal	25	5%
Reduction of dislocated prosthesis	96	17%
Revision of internal fixation	66	12%
Surgery for periprosthetic fracture	64	12%
Washout or debridement	143	26%

4. Annual summary tables

This year's tables for assessment, surgery and outcome include five new columns to help units benchmark their performance.

New columns report performance in respect of the recent changes to best practice:

- *Physiotherapy assessment by the day after surgery*
- *Nutritional risk assessment*
- *Delirium assessment*

Surgery supervised by consultant surgeon and anaesthetist has been added as a measure of adherence to NICE CG124 guidance on surgical supervision.

Follow-up at 120 days seeks to highlight the importance of monitoring patients' final outcome, and examining and supporting their persistence with bone protection medication.

Documented not to have had a reoperation within 120 days seeks to encourage the development of local surgical surveillance mechanisms – so that hospitals know whether their patients have received successful surgery.

Some sites continue to struggle to capture data on all cases, but in spite of this NHFD's overall case ascertainment was 104% if measured against HES data.

This means that NHFD has identified substantial under recording of this relatively easily identified condition in HES. This makes HES unreliable as a denominator with which to assess case ascertainment.

Instead we have compared figures for 2016 with those for 2015. This indicates a 1% increase in overall case numbers being recorded this year.

[Tables for assessment, surgery and outcomes](#) are arranged by country (England, Wales and Northern Ireland) and region.

Source: National Hip Fracture Database 2017

5. Mortality

The age and frailty of patients mean that up to a third die within a year following a hip fracture.

Such figures are potentially alarming for patients, their loved ones and those looking after them. However, in a study undertaken in collaboration with the University of Nottingham we examined the timing of inpatient deaths after hip fracture.

This study has been published in *Anaesthesia*, and in it we provide reassurance to clinicians, patients and their families that the quality of modern anaesthesia and surgery now means that over 97% of patients will survive the 48 hours after surgery even in the most poorly subgroups of patients.

Most mortality occurs later in the patient's stay and reflects the multidisciplinary challenge of their frailty. Only half of deaths in the following months can be directly attributed to the injury, hospitalisation and surgery, but patients, their families and carers often recognise the impact of hip fracture in precipitating or complicating a patient's final illness.

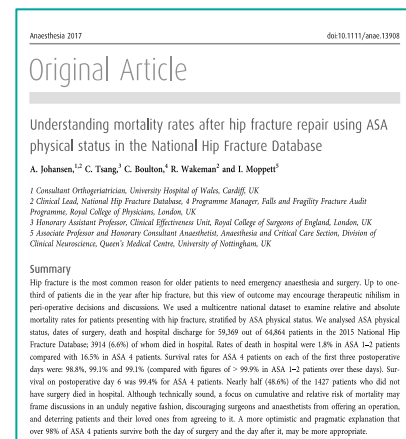


Image © 2017 The Association of Anaesthetists of Great Britain and Ireland

NICE CG124 identified prompt surgery and coordinated multidisciplinary orthogeriatric care as key factors in improving patient outcomes and mortality after hip fracture.

Independent evaluation by Neuburger *et al* published in *Medical Care* in 2015 used non-NHFD data to show how trends in 30-day mortality have responded since NHFD's inception in 2007, when the figure was 10.9%, to 8.5% in 2011.

Casemix-adjusted analysis of 30-day mortality

We performed a casemix-adjusted analysis of 30-day mortality using externally validated data from the ONS and Northern Ireland and [the methodology previously described](#).



Source: National Hip Fracture Database 2017

- We included people aged 60 years or older, who presented during 2016, and only excluded duplicates, or cases where dates of death and admission were missing.

- Crude rates of mortality within 30 days of presentation were calculated – these are already available to participating hospitals in NHFD run charts.
- Casemix adjustment uses six variables: age, sex, anaesthetic (ASA) grade, source of admission, mobility and fracture type. [View the model coefficients](#).
- We used funnel plots of crude and adjusted mortality to compare units' performance; 'outliers' being those with adjusted mortality outside the 99.8% (3SD) control limits.
- The completeness and quality of these units' data were reviewed.

A total of 65,645 patients from all 177 trauma units in England, Wales and Northern Ireland were included in this year's mortality analysis – slightly more than the 64,858 last year.

In spite of this we recorded just 4,398 people (*cf* 4,622 in 2015 and 4,821 in 2014) to have died within 30 days of presentation, giving an overall mortality rate of 6.7% for 2016.

This figure represents a further improvement in 30-day mortality from the 7.1% we reported for 2015, and continues a progressive improvement from the 8.5% we reported in 2011.

The availability of run charts on the NHFD website means that the findings of this analysis should not come as a surprise to units that were identified as outliers from the funnel plot, since their crude mortality figures have been available to them throughout the last year.

All hospitals identified as showing mortality rates outside the 95% control limits were contacted prior to publication of this report. We recommend a thorough internal review of the data alongside the crude mortality we report in individual hospital run charts.

Where we have identified that increased mortality is suggestive of poor performance we recommend that sites consider requesting a multidisciplinary service review from the British Orthopaedic Association.

Hospitals with increased mortality

Our last annual report identified two hospitals as 'outliers', but both units have since shown improved mortality figures and neither was an outlier for the 2016 year.

For 2016 we identified six hospitals as 'outliers' – with casemix-adjusted 30-day mortality rates above the upper 99.8% (3 standard deviation) control limit.

- St George's Hospital, Tooting (GEO) reported a crude mortality rate that rose throughout 2016 to average 13.6% for the year. After casemix adjustment the figure was 13.9%.
- Worcestershire Royal Hospital (WRC) reported rising crude mortality throughout 2016 to average 12.1% over the year. After casemix adjustment their figure was 12.7%.
- Airedale General Hospital (AIR) had a crude mortality that was higher than in previous years and averaged 10.3%. After casemix adjustment their figure was 12.5%.

- University Hospital Coventry (UHC) reported a crude mortality rate that has been rising since 2015. This averaged 10.7% in 2016 and was 11.0% after casemix adjustment.
- The Princess of Wales Hospital, Bridgend (POW) reported a crude mortality of 10.1% in 2016. This is higher than in recent years, but poor data quality is an additional concern and will have contributed to the hospital's adjusted rate of 12.5% in 2016.
- Royal Gwent Hospital, Newport (GWE) recorded a crude mortality of 7.8% and an adjusted mortality of 12.0%. This is above the 99.8% limit but appears to reflect the poor quality of the data submitted to NHFD.

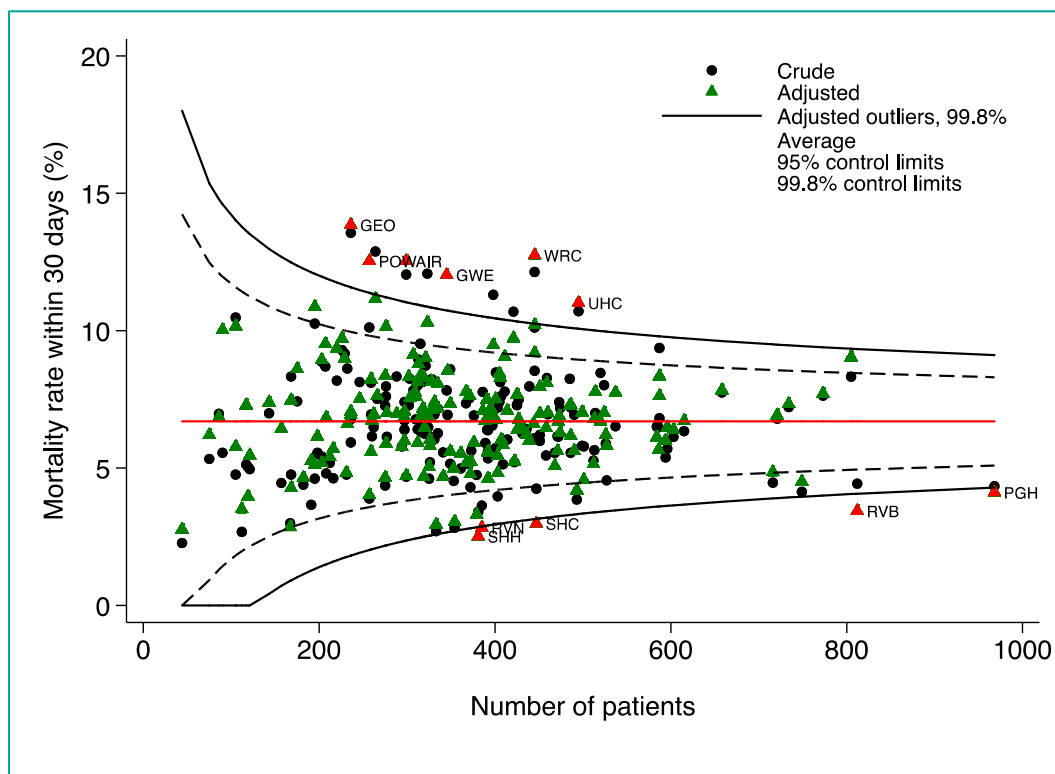


Fig 7 Funnel plot of crude and adjusted mortality rates within 30 days (2016)

A further nine hospitals had adjusted mortality above the upper 95% (2SD) control limit.

However, observations at this significance level should be interpreted with caution. In any analysis of 177 hospitals we would expect a few to fall outside these control limits by chance, simply as a result of expected statistical variation. The NHFD run charts show how the crude mortality rate in some of these hospitals fluctuated in and out of the 2SD control limit between 2015 and 2016, and some have casemix profiles that differ from the overall average or from their own profile last year.

- South Tyneside District Hospital had an adjusted mortality rate that remained above the upper 95% limit, as it was in our previous annual report.
- Seven hospitals (Royal Albert Edward Infirmary, Wigan; Basildon University; James Paget, Great Yarmouth; Norfolk and Norwich; Rotherham General; William Harvey, Ashford; Arrowe Park, Wirral) had adjusted mortality rates above the upper 95% limit in 2016, though they had not been high the previous year.

- Northwick Park Hospital had a high adjusted mortality rate but this primarily appears to reflect the poor quality of the data they submitted to the NHFD.

Hospitals with low 30-day mortality

After casemix adjustment, we identified five hospitals as ‘outliers’ – with a mortality rate below the lower 99.8% limit.

- Data submitted by St Helier Hospital, Carshalton (SHC); Royal Victoria Hospital, Belfast (RVB) and Poole General Hospital (PGH) all indicated a crude mortality rate of 4.3% in 2016, with casemix adjusted figures of 2.5%, 3.4% and 4.1% respectively, which all lie well below the 6.7% average for NHFD.
- Stepping Hill Hospital, Stockport (SHH) and Royal Victoria Infirmary, Newcastle (RVN) reported crude mortality rates of just 3.5%, though concerns over data quality make it difficult to be confident of the even lower casemix-adjusted figures for these units.

In addition we found five hospitals (Altnagelvin Hospital, Londonderry; Craigavon Area Hospital; the University Hospital of North Tees; Queen Alexandra Hospital, Portsmouth; and Royal Sussex County Hospital, Brighton) in which the adjusted 30-day mortality in 2016 was better than in the majority of units – as indicated by rates falling below the lower 95% limit.

Monitoring mortality

NHFD’s annual reporting cycle primarily serves as a review of the live web-based data we make available to drive the clinical governance process in individual hospitals.

This year we noted a marked improvement in data quality, with far fewer issues that might cast doubt on the results. This is a tribute to the many people who gather and submit the data, with the intention of benchmarking and improving care. However, if units wish to monitor and improve their performance and patient outcomes then poor data quality will limit the usefulness of the data portfolio and web-based charts that the NHFD provides to support local clinical governance.



Source: National Hip Fracture Database 2017

Crude and adjusted mortality figures for all units are detailed in the [‘Outcome’ tables](#). Regardless of whether units have been identified as outliers for 30-day mortality they should examine local run charts to consider how their crude mortality figures have changed since 2016 so they can anticipate their results for next year’s analysis.

These tables should also inform local review of data quality, especially if a marked difference between crude and adjusted mortality figures suggests the possibility of poor quality data for the casemix variables – age, sex, ASA grade, source of admission, mobility and fracture type.

Crown Informatics have developed a number of automatic mechanisms that prevent the recording of inaccurate or unlikely data, and are working with us to develop a run chart to provide feedback on the quality of crucial casemix data such as ASA grade.

References

[References for this report](#) are listed in a separate document in the order in which they appear in the text.

National Hip Fracture Database (NHFD)

The NHFD monitors the care of all hip fracture patients in England, Wales and Northern Ireland who are aged 60 and over, feeding back performance data to hospitals to facilitate quality improvement.

- > www.nhfd.co.uk
- > nhfd@rcplondon.ac.uk
- > +44(0)20 3075 2395

Falls Pathway Workstream

The Falls Pathway workstream carried out the first National Audit of Inpatient Falls in 2015. The aim of this snapshot audit is to measure compliance against national standards of best practice in reducing the risk of falls within acute care. The second round of audit took place in 2016.

- > www.rcplondon.ac.uk/fffap
- > falls@rcplondon.ac.uk
- > +44(0)20 3075 1511

Fracture Liaison Service Database (FLS-DB)

The FLS-DB aims to improve the quality of care for patients at risk of fractures by enabling NHS organisations to compare outcomes, identify and share best practice, identify gaps or shortfalls in commissioning services, and provide a comprehensive picture of fragility fracture care.

- > www.rcplondon.ac.uk/fffap
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