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# IRISH HIP FRACTURE DATABASE

NATIONAL  
REPORT 2016

*Better, safer care*

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## NATIONAL OFFICE OF CLINICAL AUDIT (NOCA)

NOCA was established in 2012 to create sustainable clinical audit programmes at national level. NOCA is funded by the Health Service Executive Quality Improvement Division and operationally supported by the Royal College of Surgeons in Ireland.

The National Clinical Effectiveness Committee (NCEC 2015, p.2) define national clinical audit as "a cyclical process that aims to improve patient care and outcomes by systematic, structured review and evaluation of clinical care against explicit clinical standards on a national basis".

NOCA supports hospitals to learn from their audit cycles.

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**NOCA would particularly like to thank the valuable contribution of all participating hospitals, in particular the IHFD audit coordinators and clinical leads. Without their continued support and input, this audit could not continue to produce meaningful analysis of hip fracture care in Ireland.**

**We would like to thank Deirdre Carey, who provided statistical support to the IHFD for a number of years before her retirement in April 2017.**



The Irish Institute for Trauma and Orthopaedic Surgery (IITOS) was established in 1999 as a charitable organisation. IITOS delivers higher surgical training in Ireland, under the governance of the Royal College of Surgeons in Ireland.



Irish Gerontological Society

The Irish Gerontological Society (IGS) is an interdisciplinary professional organisation whose membership reflects the complexity and diversity of those interested in promoting the interests of older people and in how knowledge about ageing and later life can be enhanced and improved.

Its core purposes are education and research in the study of ageing and promoting a better understanding by the general public of ageing and related issues.



The Quality Improvement Division was established to support the development of a culture that ensures improvement of quality of care is at the heart of all services that the HSE delivers.

HSE QID work in partnership with patients, families and all who work in the health system to innovate and improve the quality and safety of our care.



The Royal College of Surgeons in Ireland provides education and training in the fields of medicine and the health sciences at undergraduate and postgraduate level. The College has a strong international presence with Schools in Malaysia, Dubai and a University in Bahrain. RCSI also provides surgery and emergency medicine training in all recognised specialities and sub-specialities.

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DESIGNED BY  
**SWERVE**

# **Irish Hip Fracture Database**

## National Report 2016

***Better, safer care***

Mr Conor Hurson  
Chair  
Irish Hip Fracture Database  
National Office of Clinical Audit  
2nd Floor, Ardilaun House  
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Dublin 2

29th September, 2017

**IRISH HIP FRACTURE DATABASE NATIONAL REPORT 2016**

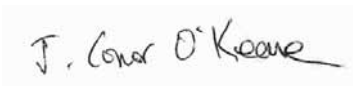
Dear Mr Hurson,

I acknowledge receipt of the Irish Hip Fracture Database National Report 2016. Following presentation by Dr Emer Ahern to the NOCA Governance Board on the 28th of September and feedback garnered from our membership, we are delighted to endorse this report.

I wish to congratulate your own and your colleagues continued efforts in supporting this valuable quality improvement initiative.

Please accept this as formal endorsement from the NOCA Governance Board of the Irish Hip Fracture Database National Report 2017

Yours sincerely,



**Professor Conor O' Keane FFPATH FRCPI**  
**Chairman**  
**National Office of Clinical Audit Governance Board**

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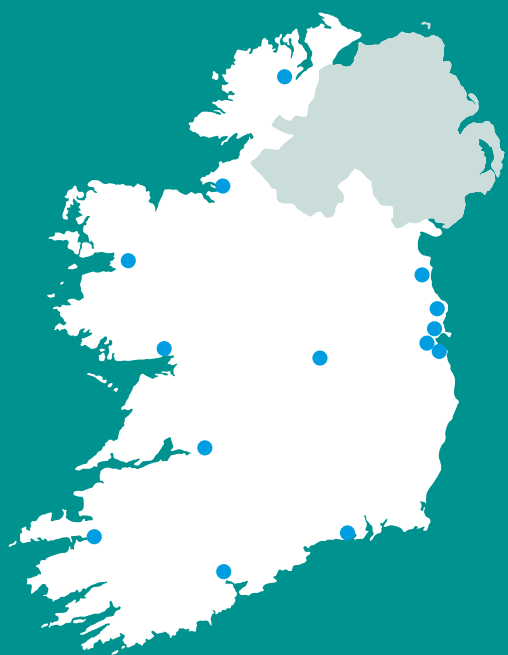
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## HIGHLIGHTS

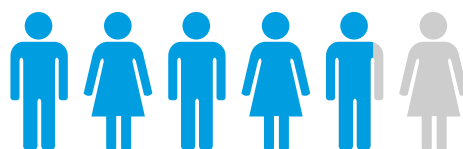
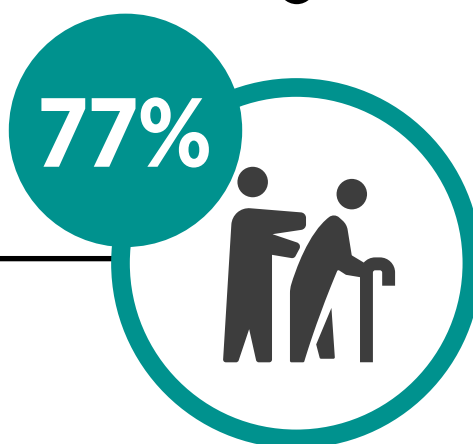
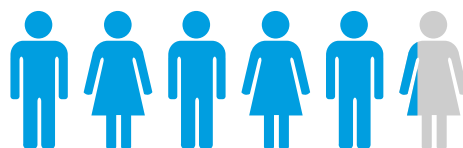
# 3,629

### HIP FRACTURES IN IRELAND 2016



Percentages shown are representative of the cases entered in IHFD in 2016

**86%\*** of hip fracture cases captured on IHFD



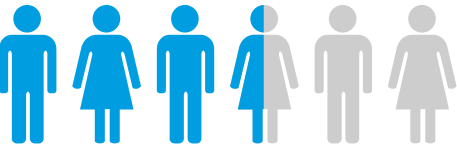
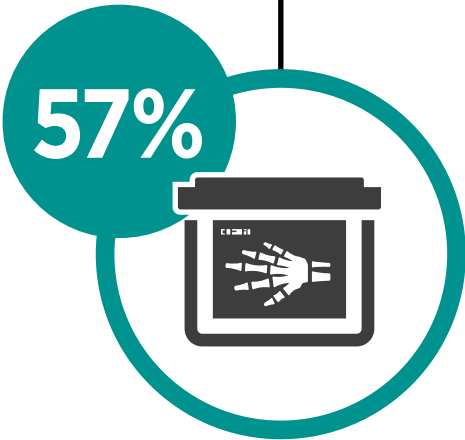
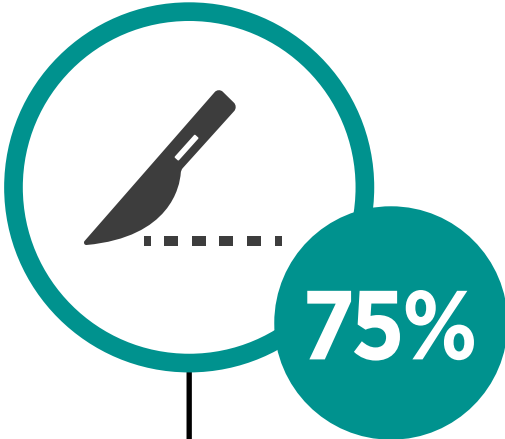
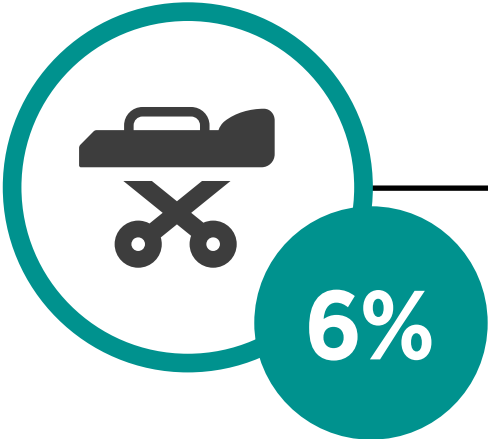
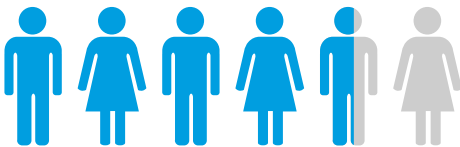
**77%** of patients mobilised day of or day after surgery

\* See footnote i and ii on Page 22

6% of patients went straight to theatre from ED



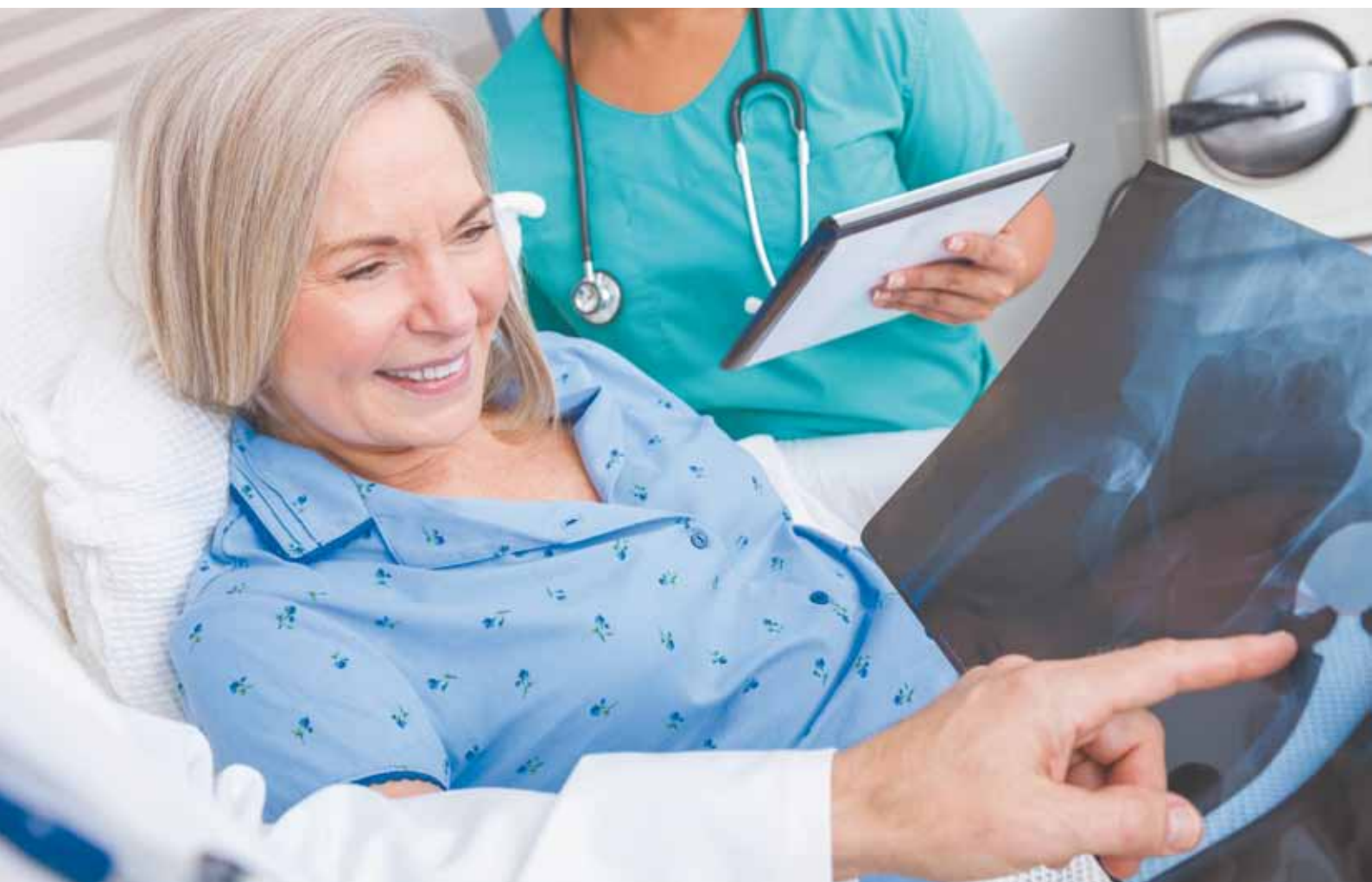
75% had surgery within 48 hours



57% received a bone health assessment



Median length of stay was 12 days



***“The mission of the Irish Hip Fracture Database is to optimise surgical, medical, nursing, rehabilitation and secondary prevention care for all hip fracture patients”***

# INTRODUCTION

Welcome to the Irish Hip Fracture Database (IHFD) National Report 2016.

This fourth IHFD report details 3,159 hip fracture cases in patients aged 60 years and over, discharged by 16 hospitals in 2016, which accounts for 86% of all hip fracture cases nationally\*.

This will be the first report to compare individual hospital performances across six clinical care standards.

Since its inception in 2012 and with more than 10,000 patient records on the database, the IHFD is now a powerful resource.

The IHFD has a clear focus on driving improvements in patient care and data quality.

As a maturing database, its remit has naturally broadened and the ability of the database to influence other areas has also grown e.g. national service re-design, research etc.

Improvements include:

- All sixteen eligible hospitals in the Republic of Ireland are now recording data.
- National service re-design e.g. trauma bypass for hip fractures.
- Increase in percentage of patients admitted to an orthopaedic ward within 4 hours.
- Increase in percentage of patients having surgery within 48 hours (75%).
- 77% of patients were mobilised on the day of or day after surgery.
- Increase in percentage of patients seen by a Geriatrician (56%).
- More patients received a bone health (57%) and falls (54%) assessment to prevent further falls and fractures.
- Median length of stay has reduced to 12 days.
- Coverage of hip fracture cases has increased to 86%.
- Completeness of data has increased to 98%.
- In 2018, a new KPI for hip fractures will be tested which will measure the percentage of patients with hip fractures who have surgery within 48 hours from time of first presentation. This KPI will use IHFD data as its source.

The IHFD was invited to participate in a comparison of eight hip fracture registers from around the world. The paper was published in 'Injury' (Johansen et al., 2017). This collaboration across nations further strengthens the focus and power of such registries to drive better, safer care for hip fracture patients.

\* See footnote i and ii on Page 22

## OUR VISION

Moving forward, the IHFD has a clear vision of what needs to be achieved to provide optimal care to hip fracture patients.

The key recommendations provide a focus for what we want to achieve in the year ahead but we must acknowledge that there are still key areas we must address in the longer term of the audit.

Currently the audit is focused on process measures, but we envision that the future of the audit will look towards patient reported outcomes measures and long term follow-up data. After the publication of our next report, we will aspire to also publish trend data year on year.

Additionally, we are committed to expanding the research portfolio of the Irish Hip Fracture Database and will encourage academic partnerships with universities and research centres.

Most importantly, we acknowledge that we need to capture the voice and experiences of our patients. In an effort to move towards this, two patient representatives have been invited onto the IHFD Governance Committee to ensure that we keep a patient centered focus for the future.

## WHO IS THIS REPORT AIMED AT?

The work reported here is intended for the use of a wide range of individuals and organisations, including:

- Patients and carers
- Patient organisations
- Healthcare professionals
- Hospital managers
- Hospital Groups
- Policymakers

The report has been designed in three parts:

- 1** The IHFD National Report 2016 presents our key findings on casemix, surgery and outcomes and a facilities audit. This report follows the patient's pathway from presentation to the emergency department (ED), through assessment, anaesthetics, surgery, post-operative care, rehabilitation and discharge. It benchmarks the national performance against the 6 Blue Book Standards of care for patients with hip fractures.

This is the first national report that compares individual hospital performance against the national average for the key standards of hip fracture care.

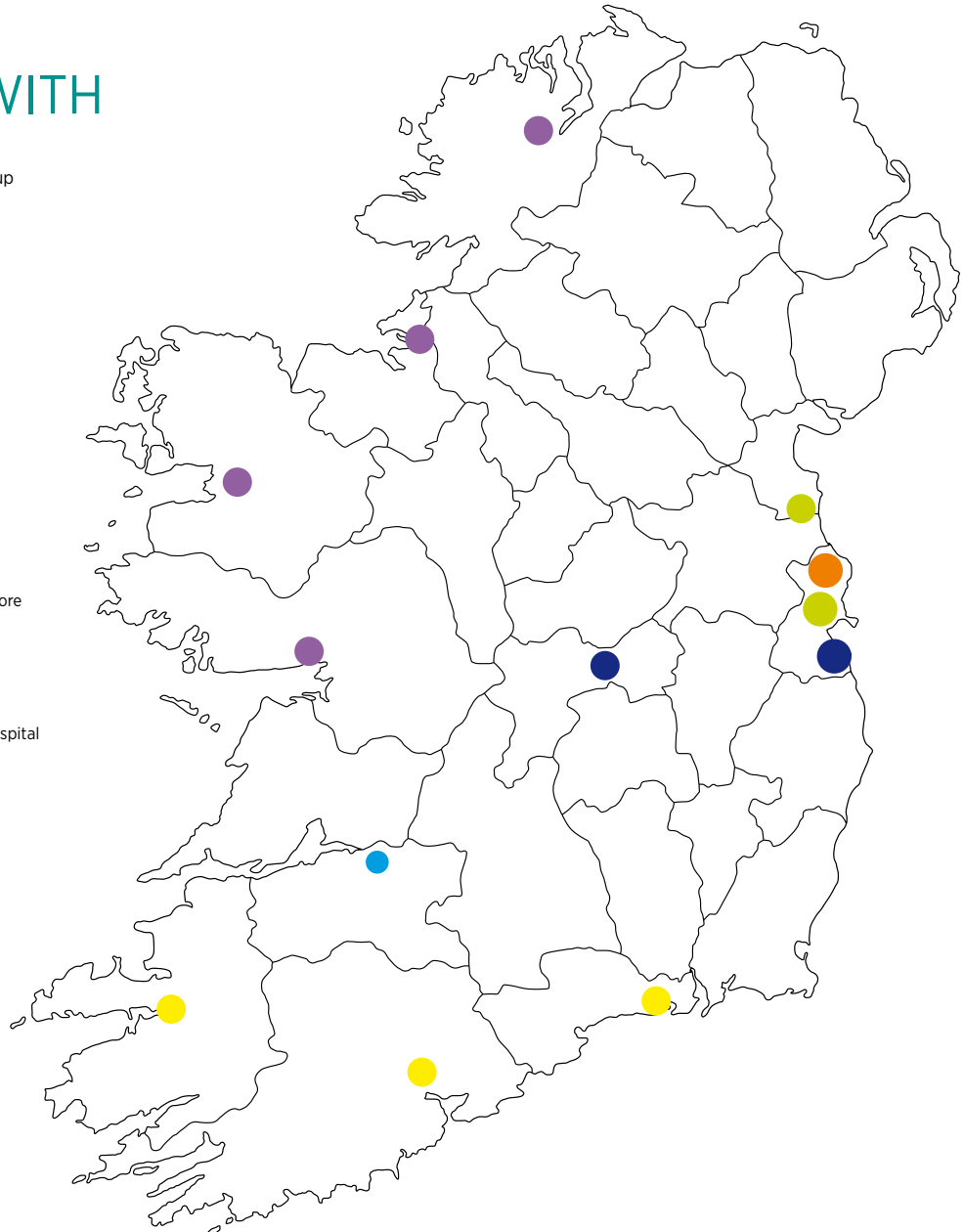
In this report, we also include a facilities audit summary from all 16 IHFD hospitals. This report is suited to healthcare professionals, hospital managers and policy makers who are trying to determine their local service priorities and improve patient care and outcomes. This report will also be of interest to patients and patient organisations. Each hospital manager and clinical lead receives quarterly update reports of their individual hospital performance.

- 2** IHFD National Report 2016: Summary Report. This report will be of particular interest to patients, patient organisations and the public.
- 3** A local hospital report for 2016 comparing the individual hospital with the IHFD National Report 2016 has been issued to the individual hospitals in advance of the national report.

# HOSPITALS WE WORK WITH

NOTE: Dublin Hospitals have been displayed collectively by hospital group

- SAOLTA UNIVERSITY HEALTHCARE GROUP**  
 Letterkenny University Hospital  
 Mayo University Hospital  
 Sligo University Hospital  
 University Hospital Galway
- RCSI HOSPITAL GROUP**  
 Beaumont Hospital  
 Connolly Hospital  
 Our Lady of Lourdes Hospital, Drogheda
- DUBLIN MIDLANDS HOSPITAL GROUP**  
 Midland Regional Hospital Tullamore  
 St James's Hospital, Dublin  
 Tallaght Hospital
- IRELAND EAST HOSPITAL GROUP**  
 Mater Misericordiae University Hospital  
 St. Vincent's University Hospital
- UL HOSPITAL GROUP**  
 University Hospital Limerick
- SOUTH / SOUTH WEST HOSPITAL GROUP**  
 Cork University Hospital  
 University Hospital Kerry  
 University Hospital Waterford



**TABLE 1: IHFD CLINICAL LEADS & DATA COORDINATORS IN HOSPITALS PARTICIPATING IN IHFD 2016**

	HOSPITAL	IHFD DATA COORDINATOR	IHFD CLINICAL LEAD
SAOLTA UNIVERSITY HEALTHCARE GROUP	Letterkenny University Hospital	Bruce MacGregor	Mr. Peter O'Rourke
	Mayo University Hospital	Francis Power	Mr. Derek Bennett
	Sligo University Hospital	AnnMarie Mullen Regina Mitchell Grainne Hamilton	Mr. William Gaine
	University Hospital Galway	Louise Brennan Catherine Armstrong	Mr. Colin Murphy
RCSI HOSPITAL GROUP	Beaumont Hospital	Aisling Murphy Renato Damalerio Clare Love	Dr. Linda Brewer
	Connolly Hospital	Jacinta Shields	Mr Paddy Kenny
	Our Lady of Lourdes Hospital, Drogheda	Pheadra McCleery Debbie McDaniel	Mr. Alan Walsh
DUBLIN MIDLANDS HOSPITAL GROUP	Midland Regional Hospital, Tullamore	Breda Conlon	Ms. Dorothy Niall
	St. James's Hospital	Alison Reynolds	Mr. Tom McCarthy Dr. Ger McMahon
	Tallaght Hospital	David Askin	Dr. Tara Coughlan Mr. Brendan O'Daly
IRELAND EAST HOSPITAL GROUP	Mater Misericordiae University Hospital	Dr John McCabe Dr Noelle O' Sullivan Dr Cliona Small	Mr. James Cashman Prof. Joe Duggan
	St Vincent's University Hospital	Ursula Kelliher	Dr. Rachael Doyle Mr. Conor Hurson
UL HOSPITAL GROUP	University Hospital Limerick	Pamela Hickey	Mr. Finbarr Condon Dr. Jude Ryan
SOUTH / SOUTH WEST HOSPITAL GROUP	Cork University Hospital	Toni O'Keeffe	Dr. Josie Clare Mr. Shane Guerin
	University Hospital Kerry	Esther O'Mahony	Mr. John Rice
	University Hospital Waterford	Louise Brent Lorraine Smith	Ms. May Cleary

# 2016 IHFD NATIONAL REPORT

## KEY FINDINGS

- 
- Six percent (6%) of patients went directly to theatre from the emergency department.
- 
- Fourteen percent (14%) of patients were admitted to a ward within 4 hours - this is an increase of four percentage points (Blue Book Standard 1).
- 
- Seventy-five percent (75%) of patients received their surgery within 48 hours. There was also a slight increase in the number of patients receiving surgery within 24 hours to 41% and 59% within 36 hours.
- 
- Five percent (5%) of hip fracture patients developed a pressure ulcer Grade 2 or higher following admission this is a one percentage point increase from 2015.
- 
- Fifty-six percent (56%) of patients were reviewed at some time during their admission by a geriatrician.
- 
- Seventy-seven percent (77%) of patients were mobilised on the day of or day after surgery. This is an increase of 4 percentage points from 2015. Of those mobilised on day of, or day after surgery 2,158 (93%) were mobilised by a physiotherapist.
- 
- Bone protection was commenced on 43% of patients during their hospital admission - this is an increase of 9 percentage points from 2015. Twenty percent (20%) received no assessment which is a 5 percentage point reduction from 2015. In total, 57% of patients reached Blue Book Standard 5 which is a ten percentage point improvement.
- 
- Prior to discharge, 54% of patients had a falls assessment during their admission, this is a seven percentage point increase from 2015 (Blue Book Standard 6).
- 
- The median length of stay has reduced by one day to 12 days.
- 
- Coverage has improved from 81% in 2015 to 86% in 2016 detailing 3,159 hip fracture cases. Thirteen hospitals achieved over 90% coverage.
- 
- Type of fracture was recorded as not known in only 3% of cases, this is an improvement of 6 percentage points from last year.
- 
- Reason for delay to surgery: There was a significant reduction in the 'not known' category from 13% in 2015 to 6% in this report. This is a seven percentage point decrease and indicates improving data quality.
-

# 2016 IHFD NATIONAL REPORT

## KEY RECOMMENDATIONS

- Every hospital participating in the IHFD should have a hip fracture committee to ensure that the data from the IHFD is being used to drive continuous quality improvement in hip fracture care. IHFD audit reports should also be made available to the Hospital and Hospital Group Quality and Safety Committee.
- Each hospital participating in the IHFD should provide an a multidisciplinary orthogeriatric service.
- Each hospital providing hip fracture surgery should be resourced to provide a seven day a week service to trauma patients- including prompt access to theatre, medical support and early mobilisation by a physiotherapist.
- NOCA will provide guidance and support to all of the local hip fracture committees.
- NOCA will continue to work with hospitals directly to put processes in place to support the current dataset and new data points to assure data quality and thereby supporting the provision of high quality reporting.

# BLUE BOOK STANDARDS 2016

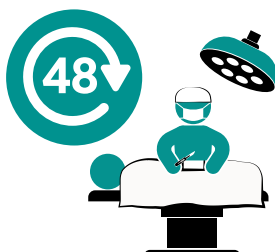
## BLUE BOOK STANDARD 1



PERCENTAGE ADMITTED  
WITHIN 4 HOURS TO  
ORTHOPAEDIC WARD

**14%**

## BLUE BOOK STANDARD 2



PERCENTAGE WHO HAD  
SURGERY WITHIN 48 HOURS  
AND DURING NORMAL  
WORKING HOURS

**73%**

## BLUE BOOK STANDARD 3



**Pressure  
Ulcers  
to Zero**

PERCENTAGE OF PATIENTS  
WHO DEVELOPED A  
NEW PRESSURE ULCER

**5%**

## BLUE BOOK STANDARD 4



PERCENTAGE SEEN AT ANY  
TIME DURING ADMISSION  
BY A GERIATRICIAN

**56%**

## BLUE BOOK STANDARD 5



PERCENTAGE OF PATIENTS  
WHO RECEIVED A BONE  
HEALTH ASSESSMENT

**57%**

## BLUE BOOK STANDARD 6



PERCENTAGE OF PATIENTS  
WHO RECEIVED SPECIALIST  
FALLS ASSESSMENT

**54%**

**TABLE 2: BLUE BOOK STANDARDS**

BLUE BOOK	IHFD MEASUREMENTS OF COMPLIANCE WITH BLUE BOOK STANDARDS	IHFD 2014 N=2,664	IHFD 2015 N=2,962	IHFD 2016 N=3,159
<b>Standard 1:</b> All patients with hip fracture should be admitted to an acute orthopaedic ward within 4 hours of presentation	Percentage admitted within 4 hours to orthopaedic ward see Appendix 6 for specifications on this calculation	9%	10%	14%
<b>Standard 2:</b> All patients with hip fracture who are medically fit should have surgery within 48 hours of admission, and during normal working hours (Mon - Sun; 08:00 - 17:59)	Percentage who had surgery within 48 hours and during working hours see Appendix 6 for specifications on this calculation	69%	72%	73%
<b>Standard 3:</b> All patients with hip fracture should be assessed and cared for with a view to minimising their risk of developing a pressure ulcer	Percentage of patients who developed a new pressure ulcer	5%	4%	5%
<b>Standard 4:</b> All patients presenting with a fragility fracture should be managed on an orthopaedic ward with routine access to acute orthogeriatric medical support from the time of admission	Percentage seen at any time during admission by a geriatrician	20%	54%	56%
<b>Standard 5:</b> All patients presenting with fragility fracture should be assessed to determine their need for therapy to prevent future osteoporotic fractures	Percentage of patients who were discharged on bone protection medication	42%	47%	57%
<b>Standard 6:</b> All patients presenting with a fragility fracture following a fall should be offered multidisciplinary assessment and intervention to prevent future falls	Percentage of patients who received specialist falls assessment	54%	49%	54%

In order to ensure compatibility with previous and future reports, percentage calculations exclude 'not known' data.



# CHAPTER 1

## COVERAGE AND COMPLETENESS OF DATA ITEMS



# CHAPTER 1: COVERAGE AND COMPLETENESS

Analysis is based on IHFD records as captured on Hospital Inpatient Enquiry System (HIPE) Portal software. It includes cases that were:

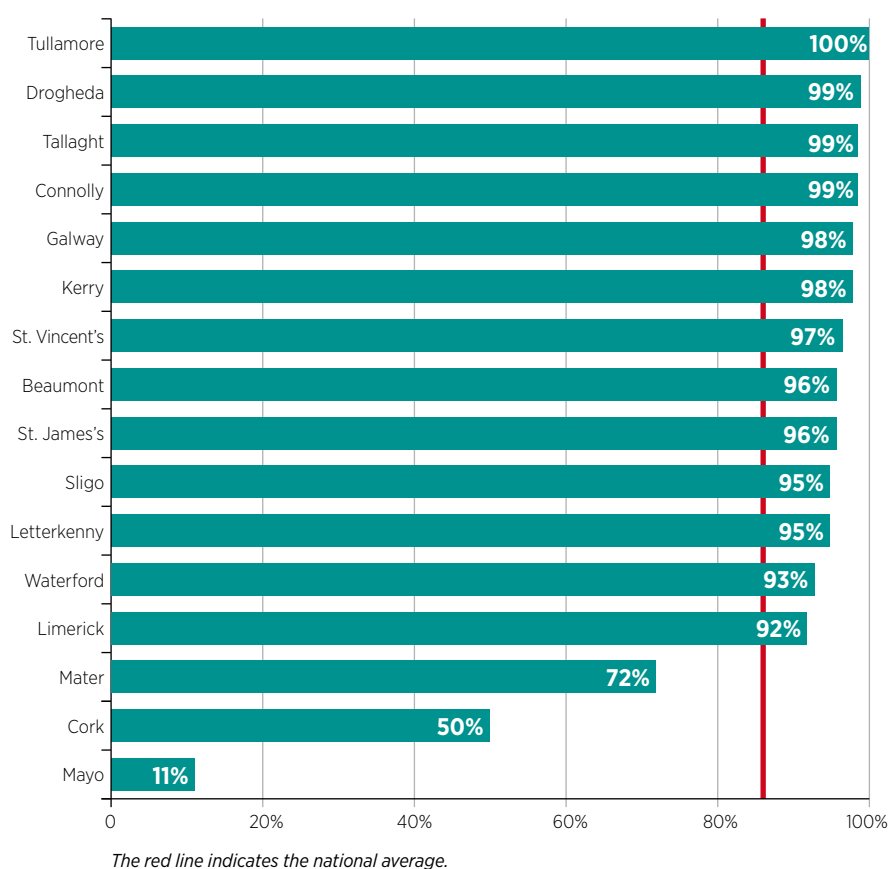
- (i) discharged from 1 January 2016 to 31 December 2016 inclusive (the HIPE data file used was 2016V16);
- (ii) diagnosed with either a hip fracture due to injury diagnosis on HIPE or a specified type of fracture, other than periprosthetic, on IHFD add-on screens; and
- (iii) aged 60 years or older.

Exclusion criteria:

- (i) In Blue Book Standards 3, 5 and 6, patients who died as an inpatient are excluded from comparative analysis but are included in the rest of the report.

The final dataset used for this report includes 3,159 cases from 16 hospitals, with the numbers of cases per hospital ranging from 14 to 378. An estimate<sup>i</sup> of what coverage<sup>ii</sup> that represented of all HIPE hip fracture cases for those hospitals combined was calculated at 86% which is an increase of five percentage points from the 81% reported on in 2015. Individual hospital coverage ranges from 12% to 100%.

**FIGURE 1: COVERAGE PERCENTAGES PER HOSPITAL**



<sup>i</sup> The estimate was based on confining the data to cases with hip fracture due to injury (ICD-10-AM S72.0 – S72.2) recorded as any diagnosis.

<sup>ii</sup> Coverage is calculated as the number of IHFD records expressed as a percentage of the total number of hip fracture cases recorded on HIPE.

Mayo University Hospital has been excluded from the analysis of the individual hospital comparison graphs as they did not enter sufficient data.

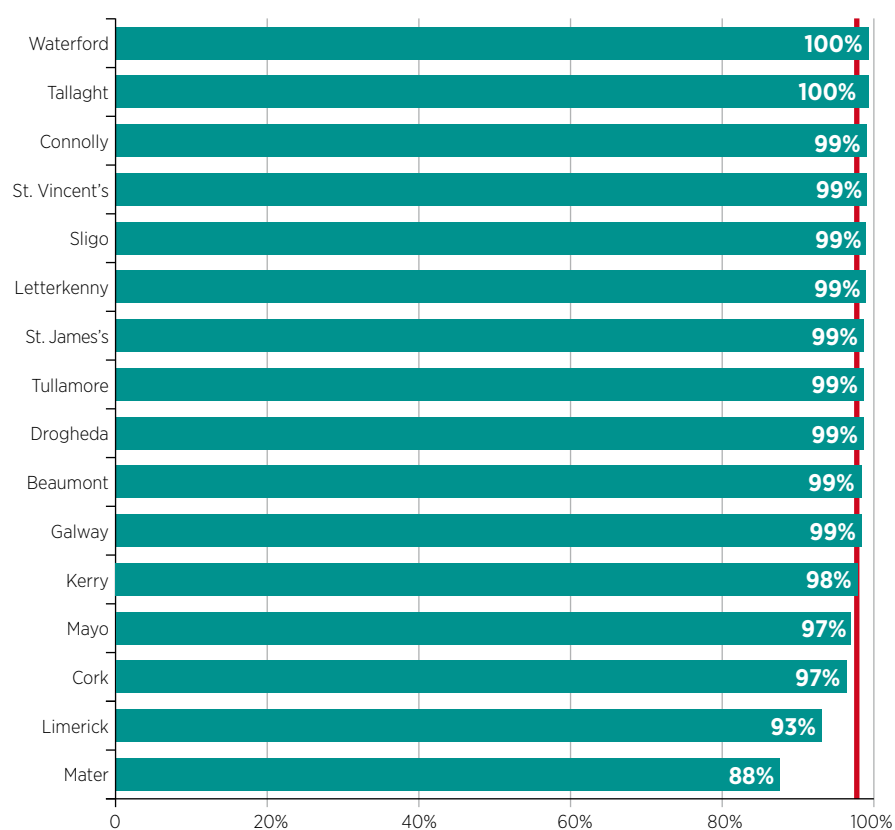
Cork University Hospital entered 50% of data for 2016 for a complete six month period (June to December) and were therefore deemed appropriate for the individual hospital comparison graphs.

Following engagement from NOCA, both Mayo University Hospital and Cork University Hospital have committed to entering data in IHFD going forward.

Completeness is defined as the proportion of fields completed (questions answered) in the individual patient level data collection. There is no clear threshold for 'satisfactory' completeness and 100% completeness is not always possible as some data may not be available for some patients. This analysis includes all data fields used in the construction of the graphs included in this report with the exception of the Cumulative Ambulatory Score, the Pre-Fracture Mobility and Pre-Fracture New Mobility Score.

The overall completeness level for this report is excellent at 98%.

**FIGURE 2: COMPLETENESS PERCENTAGES PER HOSPITAL**



*The red line indicates the national average.*



An elderly couple is walking hand-in-hand on a paved path in a park. The woman is on the left, wearing a colorful patterned dress and glasses. The man is on the right, wearing a light-colored short-sleeved shirt, khaki pants, and glasses. They are both smiling and looking at each other. The background is a lush green forest.

## CHAPTER 2

# CASE MIX

**81%**

**OF HIP FRACTURE PATIENTS  
ARE ADMITTED FROM HOME**

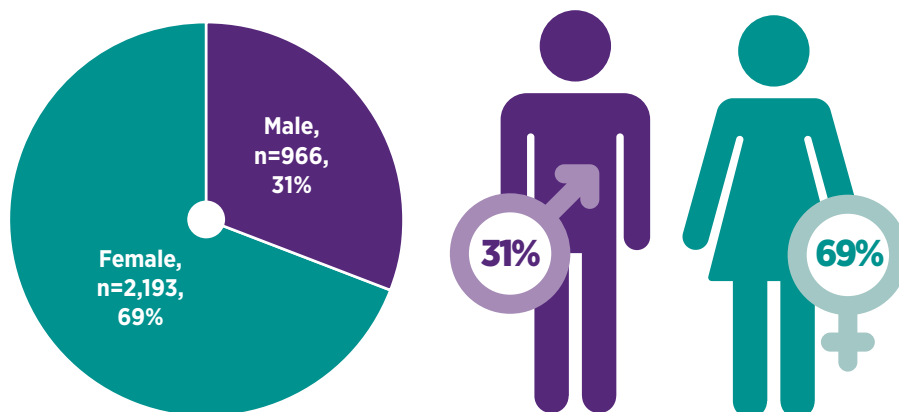
## CHAPTER 2: CASE MIX

### GENDER AND AGE GROUP

#### FINDINGS

Of the 3,159 hip fracture cases recorded, 2,193 or 69% were female, Figure 3.

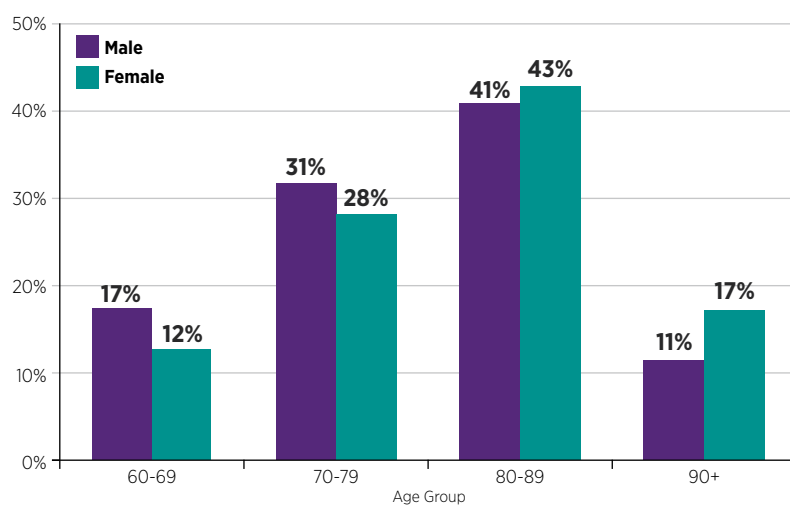
**FIGURE 3: GENDER PERCENTAGES (N=3,159)**



#### FINDINGS

Age group distributions for males and females were similar, Figure 4. The highest proportions of cases for both genders were recorded in the 80-89 age group - 41% of males and 43% females. The average age for hip fracture patients is 79 for men and 81 for women.

**FIGURE 4: GENDER BREAKDOWN BY AGE GROUP (N=3,159)**

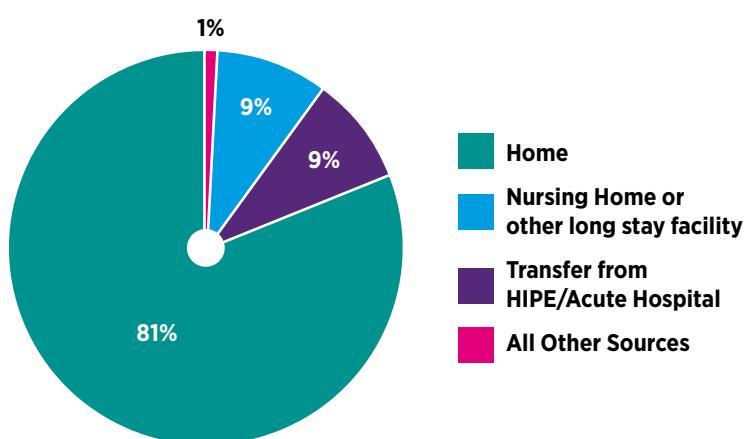


## SOURCE OF ADMISSION

### FINDINGS

Home is the most common source of admission (81%), Figure 5. Nine percent of patients were admitted from a nursing home or other long stay facility and an additional 9% were transferred from another acute hospital / HIPE reporting hospital.

**FIGURE 5: SOURCE OF ADMISSION PERCENTAGES (N=3,159)**



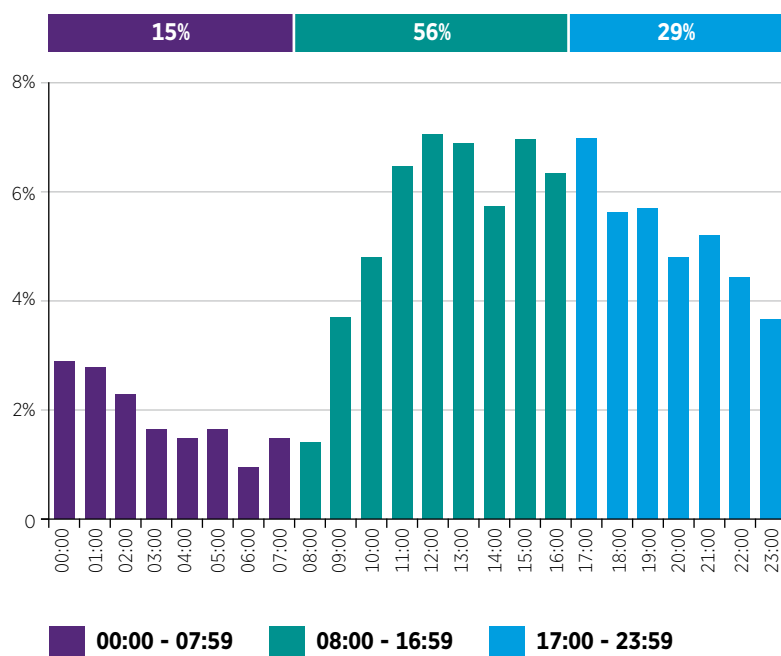
## TIME OF PRESENTATION

### CLINICAL COMMENTARY

Figure 6 shows the distributions of hip fracture presentations by time of day. A significant proportion of hip fracture patients present between 17:00 and 07:59 (44%). Consideration should therefore be given at hospital level to ensure that senior orthopaedic staff are present to complete the assessment and admission of these patients to facilitate timely surgery.

In terms of hip fracture presentations by day of week and month of year, the distributions appear even across both timelines.

**FIGURE 6: PRESENTATION OF HIP FRACTURES BY TIME OF DAY (n=3,157)\***



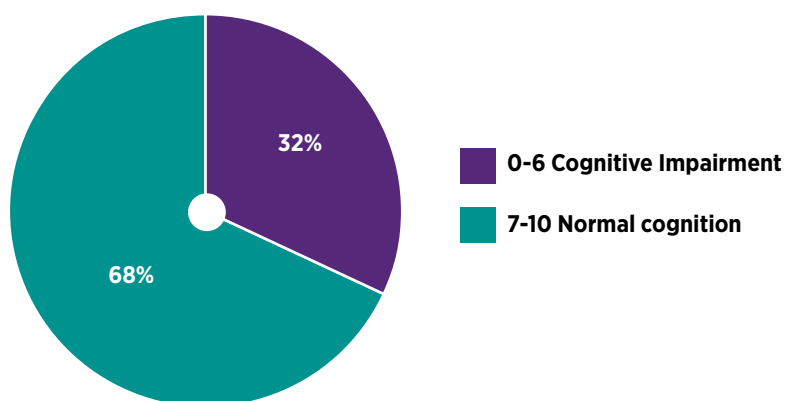
\*Includes cases with valid time records only.

## AMT SCORE

### FINDINGS

An abbreviated Mental Test (AMT) (See Appendix 3) was recorded in 396 (13%) cases, this is a three percentage point increase however the deficit of known score is a reflection of this test not being conducted as opposed to data not being recorded. Of those cases recorded, 68% had scores of 7-10 inclusive i.e. they were not likely to have cognitive impairment, Figure 7.

**FIGURE 7: KNOWN AMT SCORE PERCENTAGES (n=396)**



ASA GRADE

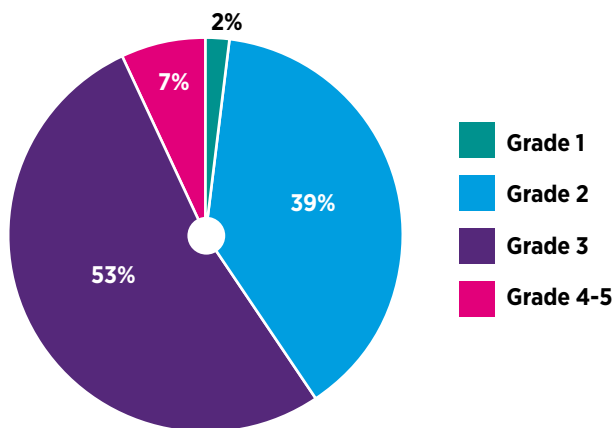
FINDINGS:

The American Society of Anaesthesiologist grades (Dripps, 1963) are displayed for 2,768 (91%) of patients. The highest proportion of cases were graded as Grade 3 - Severe (53%) (n=1,456) and Grade 2 - Mild (39%) (n=1,072). Grade 4 and 5 accounted for 7% (n=180). The ASA classification of 'E' for Emergency is not specifically mentioned but assumed for all hip fractures recorded in IHFD.

TABLE 3: AMERICAN SOCIETY OF ANAESTHESIOLOGISTS PHYSICAL STATUS CLASSIFICATION (ASA, 1963)

- |  |
|--|
| 1. Healthy person.   |
| 2. Mild systemic disease.  |
| 3. Severe systemic disease.  |
| 4. Severe systemic disease that is a constant threat to life.              |
| 5. A moribund person who is not expected to survive without the operation. |

FIGURE 8: KNOWN ASA GRADE PERCENTAGES (n=2,768)<sup>iii</sup>



<sup>iii</sup> Please note: Percentages may not sum to 100% due to rounding

## PRE-FRACTURE MOBILITY

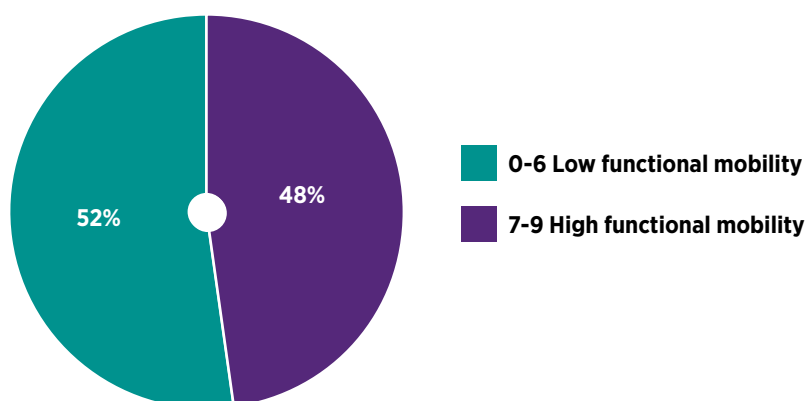
### FINDINGS

In 2016 a new data field to measure pre-fracture mobility was introduced, the New Mobility Score (NMS) (see Table 4). Figure 9 details the pre-fracture New Mobility Score for 2,383 patients. Forty-eight percent (48%) (n=1,105) of patients had high function pre-fracture (NMS 7-9), with 42% independent indoor walking, outdoor walking and shopping (NMS=9). Fifty-two percent (52%) (n=1,198) had low functional ability pre-fracture (NMS 0-6). Figure 9A below gives further detail on each individual functional activity.

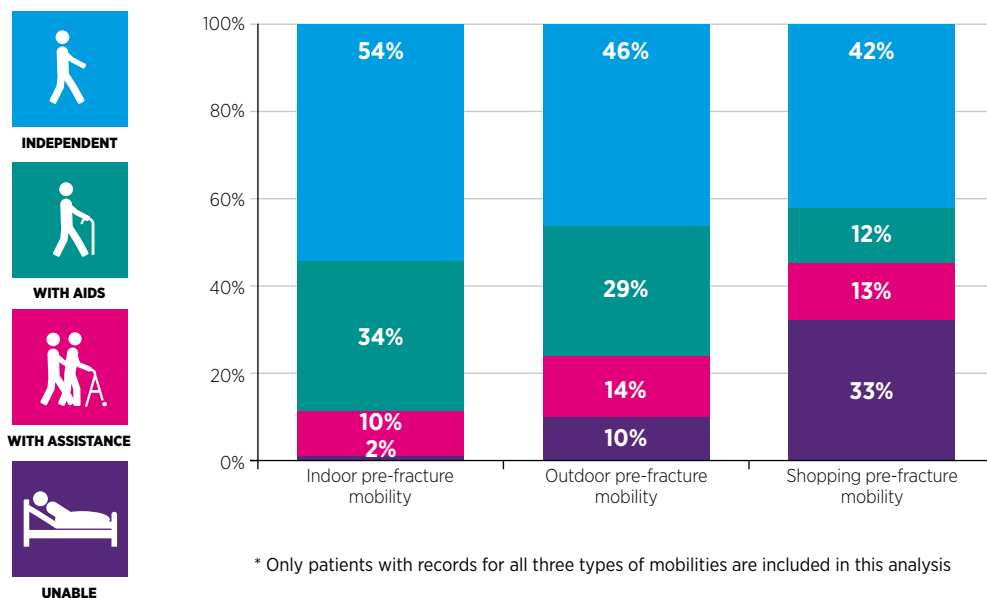
### CLINICAL COMMENTARY

The New Mobility Score was introduced to the IHFD in 2016 to help determine baseline mobility (Parker and Palmer, 1993; Kristensen et al., 2008; Kristensen et al., 2010). It is a self-reported measure validated in hip fracture populations. It quantifies a patient's ability to complete three functional activities: indoor walking, outdoor walking and shopping. A score is given to each activity on a four point scale and combined to provide a final number between 0 and 9, where 9 is independent with no aid in all three activities, and 0 is not able to carry out any of the activities (Parker and Palmer, 1995).

**FIGURE 9: PRE-FRACTURE NEW MOBILITY SCORE (NMS) TOTAL SCORE (n=2,383)**



**FIGURE 9A: PRE-FRACTURE NEW MOBILITY SCORE (NMS) INDIVIDUAL COMPONENT SCORES (n=2,383)<sup>(iv)\*</sup>**



**TABLE 4: NEW MOBILITY SCORE**

WHEN	FIELD NAME	FULL DETAIL	COMMENT
Pre-fracture mobility	Indoor Walking	0 Unable 1 Assistance of one person 2 With an aid 3 independent	Please give a score for each of the three categories. The total NMS score (0-9) is the sum of the three categories, and will be automatically calculated by the database when all three categories are filled in.  <b>Example:</b> Indoor Walking: 2 Outdoor Walking: 2 Shopping: 1 Total NMS: 5
	Outdoor Walking	0 Unable 1 Assistance of one person 2 With an aid 3 independent	
	Shopping	0 Unable 1 Assistance of one person 2 With an aid 3 independent	
	Pre-Fracture New Mobility Score total	0-9	

<sup>iv</sup> Please note: Percentages may not sum to 100% due to rounding

\* Only patients with records for all three types of mobilities are included in this analysis

## TYPE OF FRACTURE

### FINDINGS

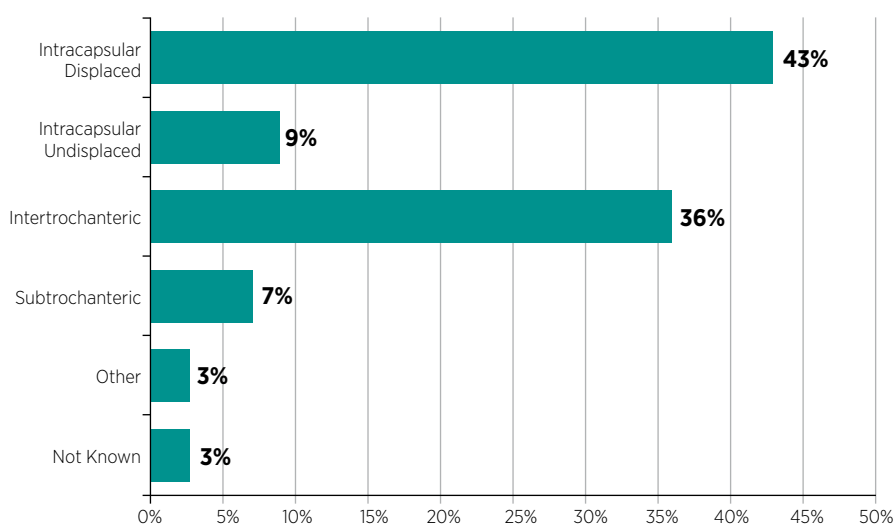
The most common types of fractures recorded were Intracapsular - Displaced (43%) and Intertrochanteric (36%), Figure 10.

### CLINICAL COMMENTARY

Type of fracture was recorded as not known in 3% of cases, this is an improvement of 6 percentage points from last year's report and signifies improving data quality. This improvement demonstrates the impact of the education and additional supports built into the IHFD portal to support uniformity and accuracy on this data point.

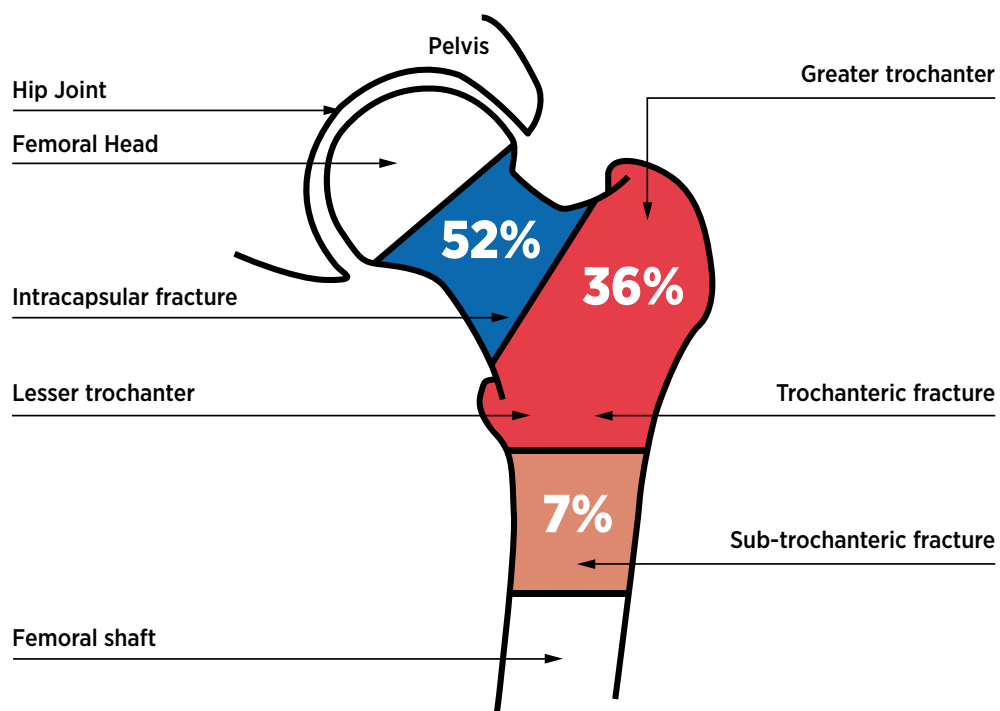
This year a number of cases were validated and reclassified into the relevant groups, this is due to various orthopaedic classifications being used in Figure 10.

**FIGURE 10: TYPE OF FRACTURE PERCENTAGES (n=3,159) <sup>(v)</sup>**



<sup>v</sup> Please note: Percentages may not sum to 100% due to rounding

**FIGURE 11: CLASSIFICATION OF HIP FRACTURES**



Fractures in the blue area are intracapsular and those in the red and orange areas are extracapsular (Parker and Johansen, 2006)

A close-up photograph of two surgeons in an operating room. They are wearing blue surgical caps and white masks. The surgeon in the foreground is looking down at a surgical site, while the second surgeon is visible behind him, also focused on the work. They are using surgical instruments, and a red tube is visible on the right side of the frame.

## CHAPTER 3 **SURGERY**

**75%**

**OF HIP FRACTURE PATIENTS  
RECEIVED SURGERY  
WITHIN 48 HOURS**

## CHAPTER 3: SURGERY

### MODE OF ADMISSION TO HOSPITAL

#### FINDINGS

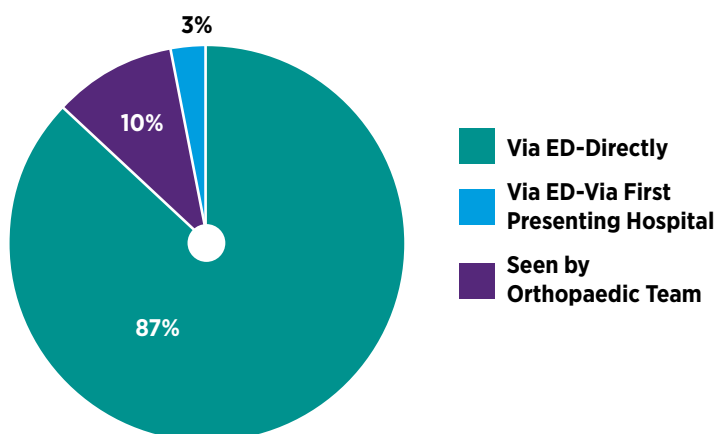
Figure 12 shows that 87% of patients presented directly to an ED in an operating hospital, 3% were transferred from an ED in a non-operating hospital to an ED in an operating hospital. The remaining 10% were transferred from an ED in a non-operating hospital to a ward in an operating hospital and were seen by the orthopaedic team.

#### CLINICAL COMMENTARY

In 2016, the Clinical Programme for Trauma and Orthopaedic Surgery, in conjunction with the HSE Acute Hospitals Division, have delivered trauma bypass for hip fracture patients in the South-East i.e. from St. Luke's General Hospital Kilkenny, Wexford General Hospital, and South Tipperary General Hospital to University Hospital Waterford and from Cavan General Hospital to Connolly Hospital.

### 37 PATIENTS (1%) FELL AS AN INPATIENT IN THE OPERATING HOSPITAL AND HAD A HIP FRACTURE

**FIGURE 12: MODE OF ADMISSION TO OPERATING HOSPITAL (N=3,159)**



## ADMISSION TO ORTHOPAEDIC WARD

### BLUE BOOK STANDARD 1:

ALL PATIENTS WITH HIP FRACTURE SHOULD BE ADMITTED TO AN ACUTE ORTHOPAEDIC WARD WITHIN 4 HOURS OF PRESENTATION.

### SOURCE:

British Orthopaedic Association (BOA) and British Geriatrics Society (BGS), 2007. 'Blue Book' The care of patients with fragility fracture (BOA and BGS, 2007).

### FINDINGS

Figure 13 shows that 90% (n=2,849) of patients were admitted to an orthopaedic ward but only 14% were admitted to a ward within 4 hours. This is a four percentage point improvement from 2015.

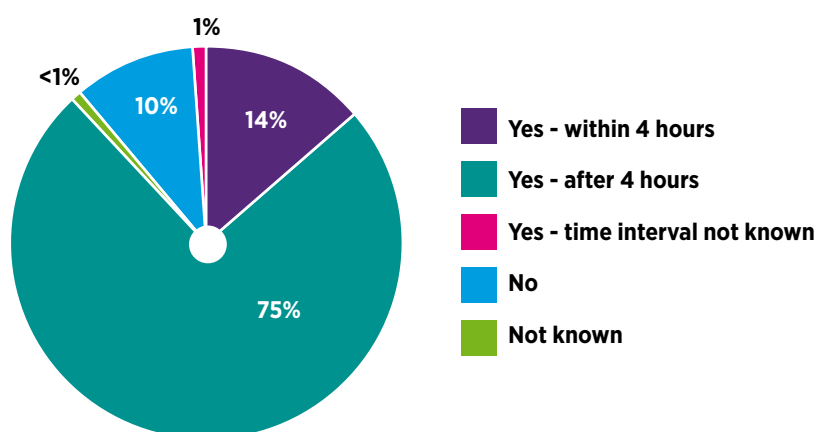
For cases admitted via ED, the time interval is calculated from time of first arrival at ED whether in the first presenting hospital or in the operating hospital. Compliance with this standard is very low. Hip fracture patients who are being brought to non-operating hospitals first are contributing to this.

### SIX PERCENT (6%) (n=174) OF PATIENTS WENT DIRECT TO THEATRE FROM THE EMERGENCY DEPARTMENT

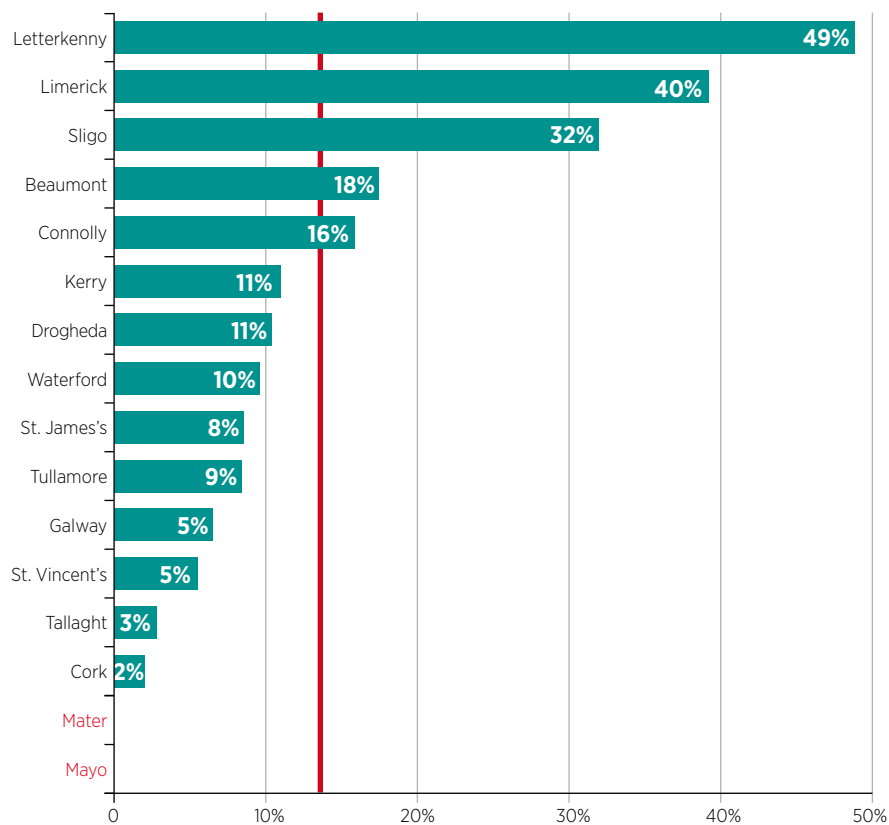
The median time for admission to orthopaedic ward is 8.5 hours and the mean is 25.3 hours.

There is huge variation in meeting this standard among the hospitals with ranges from <1% - 49%, See Figure 13A.

**FIGURE 13: ADMISSION TO ORTHOPAEDIC WARD (N=3,159) <sup>(vi)</sup>**



**FIGURE 13A: ADMISSION TO ORTHOPAEDIC WARD WITHIN 4 HOURS BY HOSPITAL (n=3,100)**



*Mayo University Hospital has been excluded from the analysis of this hospital comparison graph as they did not enter sufficient data.*

*Mater Misericordiae University is not itemised separately as they entered data for less than 5 patients.*

*The red line indicates the national average.*

<sup>vi</sup> Please note: Percentages may not sum to 100% due to rounding

## SURGERY PERFORMED

### FINDINGS

Figure 14 illustrates that 3,029 (96%) of the 3,159 hip fracture cases were operated on. 'No operation performed' was recorded in 4% (n=126) of cases.

### CLINICAL COMMENTARY

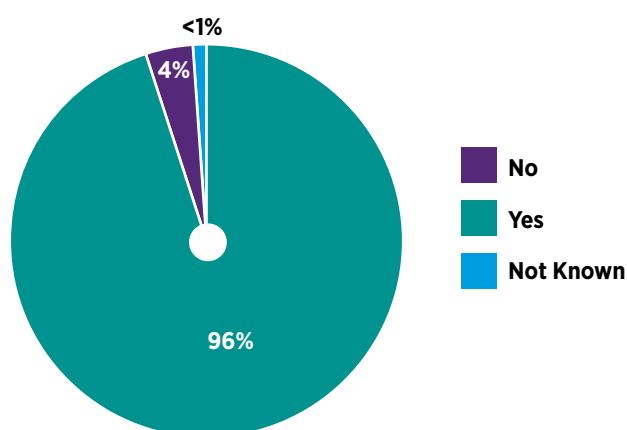
Operative treatment of a hip fracture is associated with reduced morbidity and mortality, improved functional outcomes and reduced length of stay (Bohm et al., 2015). The number of patients deemed for non-operative treatment should be very low. All patients should be considered for surgical treatment as fixation will provide pain relief and improved potential for recovery.

In some cases, non-operative treatment is appropriate as the fracture does not require surgery e.g. trochanteric or stable fractures or delayed presentation of a healing fracture.

The database does not currently differentiate between cases where non-operative treatment has been selected due to patients being too unwell or where surgical treatment is not required.

Hip fracture surgery should be performed on a scheduled trauma list with a consultant present. Surgery should be performed to ensure anatomical reduction and stable fixation is achieved where possible to allow unrestricted early weight bearing. This greatly improves patient outcomes and reduces re-operation rates (NICE, 2011).

**FIGURE 14: SURGERY PERFORMED PERCENTAGES (N=3,159) <sup>(vii)</sup>**



<sup>vii</sup> Please note: Percentages may not sum to 100% due to rounding

## TIME TO AND TIME OF SURGERY

### BLUE BOOK STANDARD 2:

ALL PATIENTS WITH A HIP FRACTURE WHO ARE MEDICALLY FIT SHOULD HAVE SURGERY WITHIN 48 HOURS OF ADMISSION, DURING NORMAL WORKING HOURS.

### SOURCE:

British Orthopaedic Association (BOA) and British Geriatrics Society (BGS), 2007. 'Blue Book' The care of patients with fragility fracture (BOA, BGS, 2007)

### FINDINGS

Analysis indicates that 75% of surgeries were conducted within 48 hours – over 72% during working hours (Monday-Sunday 08:00-17:59) and over 2% out-of-working-hours, Figure 15.

### CLINICAL COMMENTARY

There needs to be improvement in the proportion of medically well patients getting to surgery within the specified time.

The HSE Key Performance Indicator (KPI) for hip fracture surgery reports on the percentage of emergency hip fracture surgeries with the principal procedure carried out on days 0, 1 or 2 of the stay with a specified target of 95%. The HSE reported 85% for 2016 data on this KPI (HSE, 2014). In 2018, a new KPI for hip fractures will be tested which will measure the percentage of patients with hip fractures who have surgery within 48 hours from time of first presentation. This KPI will use IHFD data.

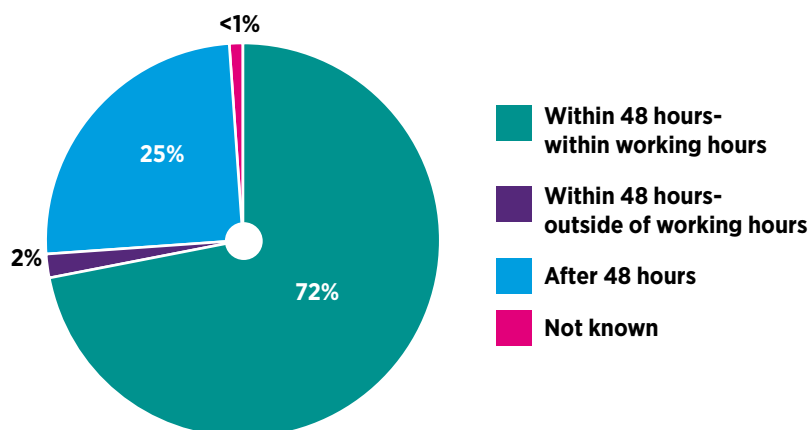
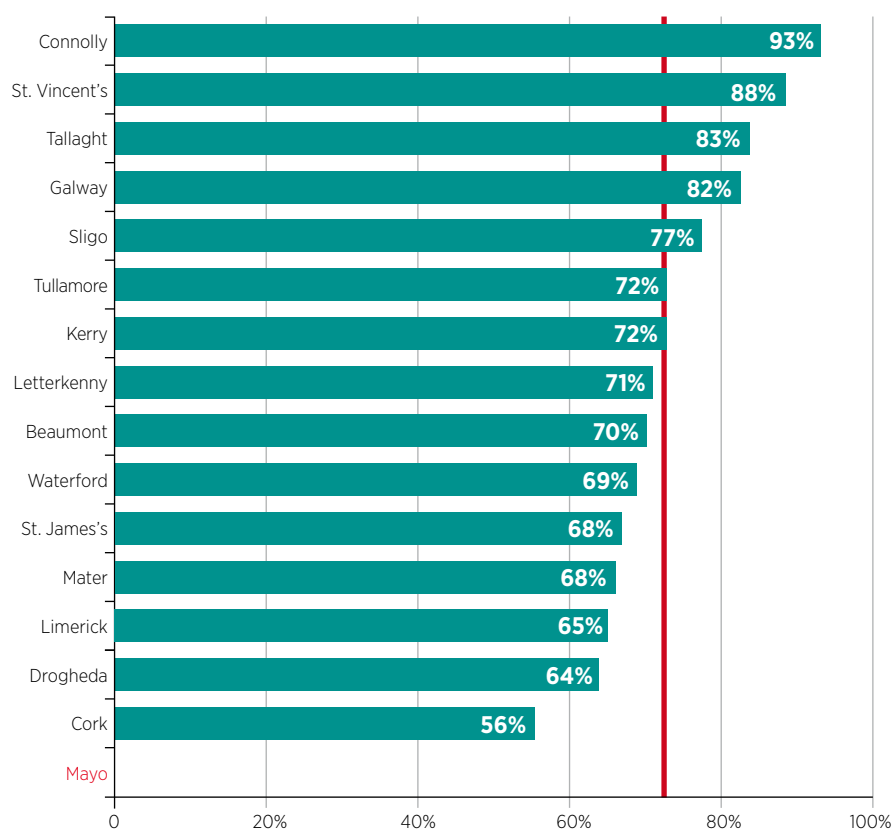
The differences between the current HSE KPI and the IHFD calculation for time to surgery are as follows:

- HSE KPI data is sourced from HIPE and analysed by the Healthcare Pricing Office (HPO).
- HSE calculates the time interval in days from date of admission to a ward whereas the IHFD does so in hours from time of presentation at the Emergency Department or seen by the orthopaedic team.
- HSE includes hip fracture due to injury only (ICD-10-AM S72.0 – S72.2) whereas the IHFD includes all hip fractures.
- HSE report on ages over 65 years and IHFD report on ages 60 years and over.

The proportion of patients meeting this Blue Book Standard at individual hospital level ranges from 56%-93%, Figure 15A. The median time to surgery is 27.5 hours and the average is 48.1 hours.

Some key issues causing difficulties for hospitals achieving this target are lack of seven day trauma theatre access, delays in admissions, low levels of orthogeriatric input in the pre-operative phase, theatre inefficiencies and orthopaedic consultant specialties dominating trauma lists. Two hospitals have no dedicated trauma theatre access and seven have no dedicated trauma theatre access at weekends.

The National Model of Care for Trauma and Orthopaedic Surgery (2015) recommends seven day trauma theatre access in all sixteen trauma centres and equal access for all trauma patients. Hip fractures should be given high priority on the trauma list.

**FIGURE 15: TIME TO AND TIME OF SURGERY PERCENTAGES (n=3,029) <sup>(viii)</sup>****FIGURE 15A: TIME TO SURGERY WITHIN 48 HOURS AND DURING NORMAL WORKING HOURS BY HOSPITAL**

*Mayo University Hospital has been excluded from the analysis of this hospital comparison graph as they did not enter sufficient data.*

*The red line indicates the national average.*

<sup>viii</sup> Please note: Percentages may not sum to 100% due to rounding

## REASON FOR DELAY IF SURGERY AFTER 48 HOURS

### FINDINGS

'Awaiting medical review, investigation and stabilisation' was the reason surgery was delayed more than 48 hours in half of the delayed cases, Figure 16. Issues with theatre access (12%) and theatre cancellations (12%) accounted for almost a further quarter of the delays.

### CLINICAL COMMENTARY

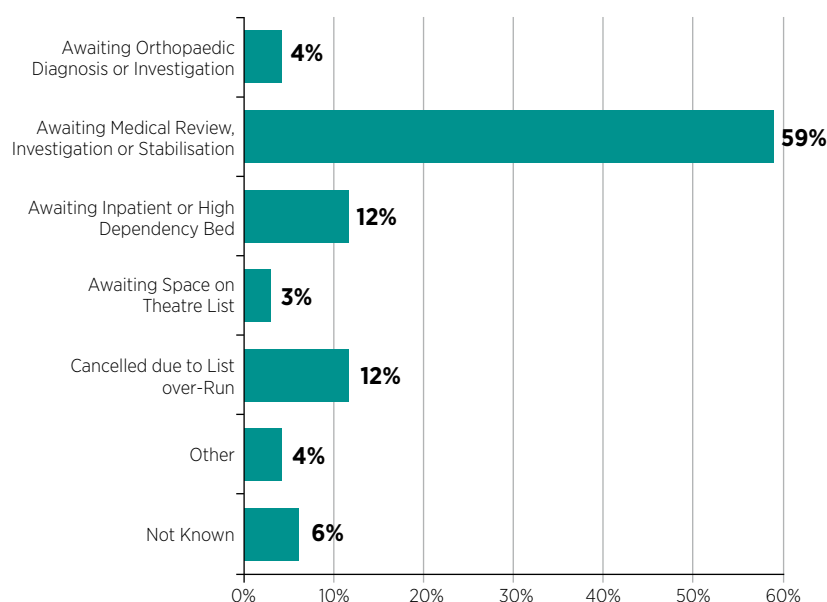
It is not possible to determine from the current dataset which element of 'awaiting medical review, investigation or stabilisation' caused the delay. In 2017, a 'freetext' field has now been added to the dataset to collect further details on what medical element caused the delay.

There was a significant reduction in the 'not known' category from 13% in 2015 to 6% in this report. This is a seven percentage point decrease.

Anticoagulants appear to be causing delays to surgery as indicated in our 'other' freetext category within the dataset. The IHFD would recommend that each of the trauma units should have a protocol in place to manage patients on anticoagulant therapies to ensure they receive timely surgery. It would be beneficial to develop this protocol with guidance from your local haematology department.

It is recommended by the National Model of Care for Trauma and Orthopaedic Surgery (2015) that patients with a hip fracture should suffer minimal delays to surgery.

**FIGURE 16: REASON FOR DELAY TO SURGERY AFTER 48 HOURS PERCENTAGES (n=704)**



*Other includes 'Awaiting inpatient or high dependency bed' and 'Problem with theatre/surgical/anaesthetic staff cover'.*

## CUMULATIVE TIME TO SURGERY

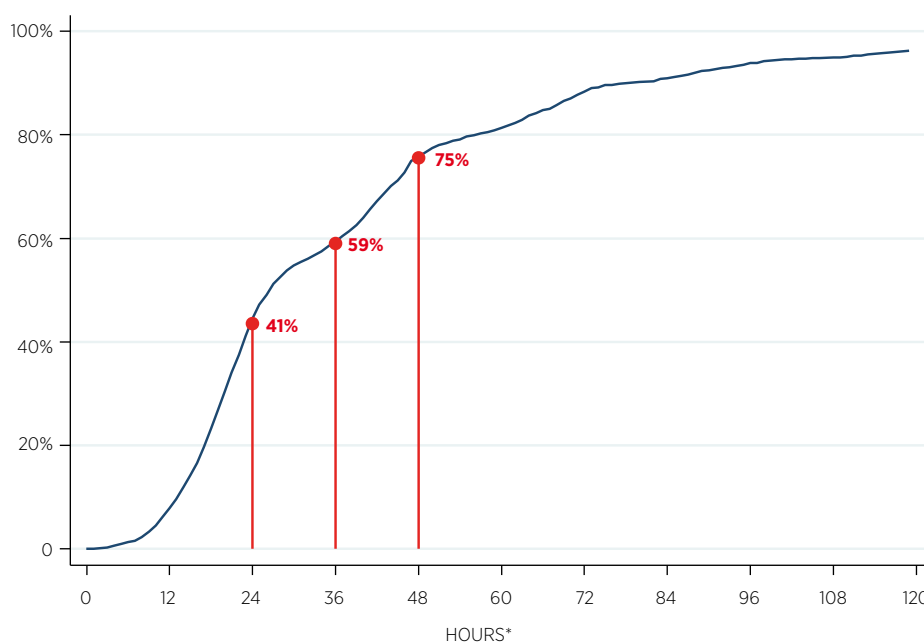
### FINDINGS

Figure 17 shows that 41% patients received their surgery with 24 hours, 59% within 36 hours and 75% within 48 hours of presentation.

### CLINICAL COMMENTARY

A systematic review of 52 published studies involving 291,413 patients indicated that early surgery could show benefits for reducing morbidity, complications, reduced pressure ulcer incidence and length of stay (Khan et al., 2009).

**FIGURE 17:** CUMULATIVE TIME TO SURGERY (N=3,018)



\*Includes cases with valid time records only.

## ASSESSMENT BY A GERIATRICIAN

### BLUE BOOK STANDARD 4:

ALL PATIENTS PRESENTING WITH A FRAGILITY FRACTURE SHOULD BE MANAGED ON AN ORTHOPAEDIC WARD WITH ROUTINE ACCESS TO ACUTE ORTHOGERIATRIC MEDICAL SUPPORT FROM THE TIME OF ADMISSION.

### SOURCE:

British Orthopaedic Association (BOA) and British Geriatrics Society (BGS), 2007. 'Blue Book' The care of patients with fragility fracture (BOA and BGS, 2007)

### FINDINGS

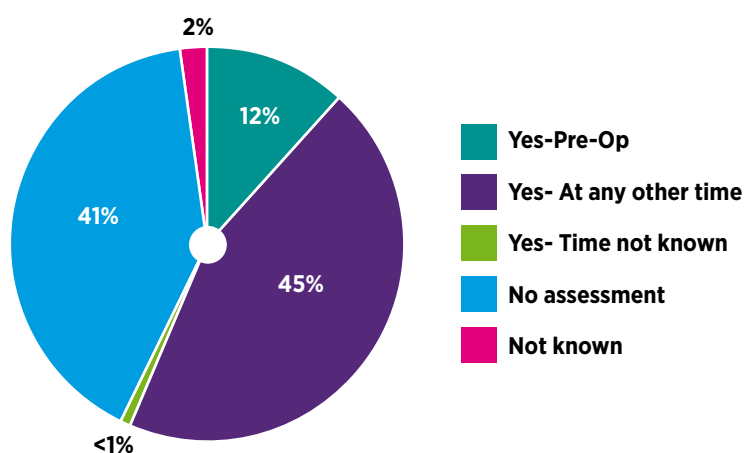
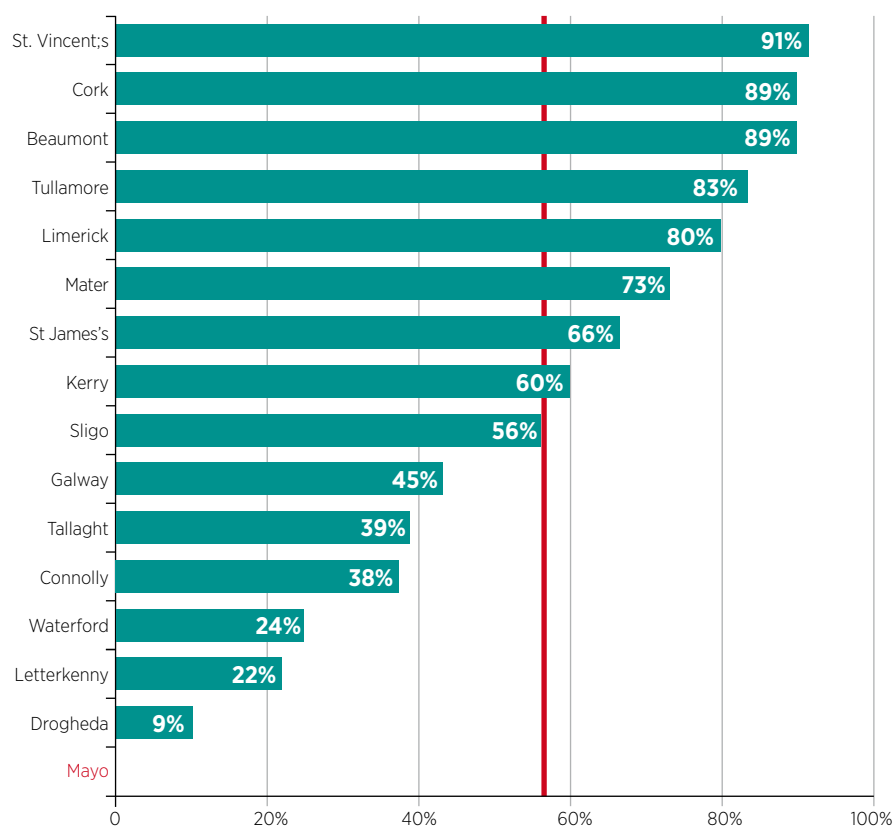
Figure 18 shows that 12% (n=372) of patients were reviewed pre-operatively by a Geriatrician and a further 44% (n=1,424) patients were assessed at some other time during their acute stay. The proportion of patients meeting this Blue Book Standard at individual hospital level ranges from 9%- 91%, Figure 18A.

Sixty-three percent (63%) of these reviews were carried out by a Consultant Geriatrician (See Appendix 7).

### CLINICAL COMMENTARY

Best practice indicates that a collaborative approach to care, combining orthopaedics and geriatrics, is fundamental for hip fracture care management (NICE, 2011). There is evidence to show that orthogeriatric models of care reduce 30 day and one year mortality (Hawley et al., 2016). The introduction of an orthogeriatric service in University Hospital Limerick led to improved patient outcomes in a cost effective manner. This included a decrease in the acute hospital length of stay by three days, reduced the volume of patients requiring rehabilitation and the length of stay in rehabilitation was also reduced by six days. As a result, less patients were discharged into long term care (Shanahan et al., 2016).

### ONLY FOUR HOSPITALS HAVE SOME DEDICATED ORTHOGERIATRIC SERVICE IN PLACE

**FIGURE 18: ASSESSMENT BY GERIATRICIAN PERCENTAGES (N=3,159) <sup>(ix)</sup>****FIGURE 18A: ASSESSMENT BY GERIATRICIAN BY HOSPITAL (N=3,133)**

*Mayo University Hospital has been excluded from the analysis of this hospital comparison graph as they did not enter sufficient data.*

*The red line indicates the national average.*

<sup>ix</sup> Please note: Percentages may not sum to 100% due to rounding

## TYPE OF ANAESTHESIA

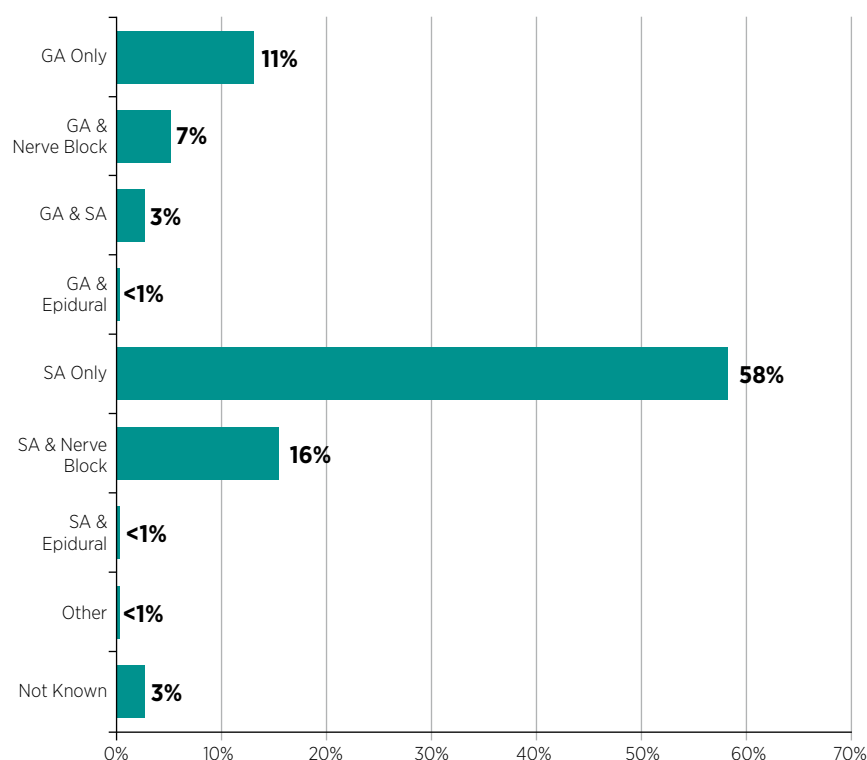
### FINDINGS

Spinal anaesthetic (SA) continues to be the predominant type of anaesthesia used (58%, n=1,759), Figure 19. It is also used in combination with general anaesthetic (GA) (3%) or with a nerve block (16%).

### CLINICAL COMMENTARY

There appears to be little difference between outcomes in patients who receive either general or neuraxial anaesthesia for hip fracture surgery (Guay et al., 2014). There has been a slight increase in the number of patients receiving nerve blocks from 21% in 2015 to 24% in 2016, however the overall number remains low. Nerve blocks have many benefits from providing patient comfort to reducing the need for opioid medication in the post-operative phase. Better pain management enables earlier ambulation and ultimately a better patient experience (Riddell et al., 2016).

**FIGURE 19: TYPE OF ANAESTHESIA PERCENTAGES (n=3,029)<sup>(x)</sup>**



<sup>x</sup> Please note: Percentages may not sum to 100% due to rounding

## TYPE OF SURGERY

### FINDINGS

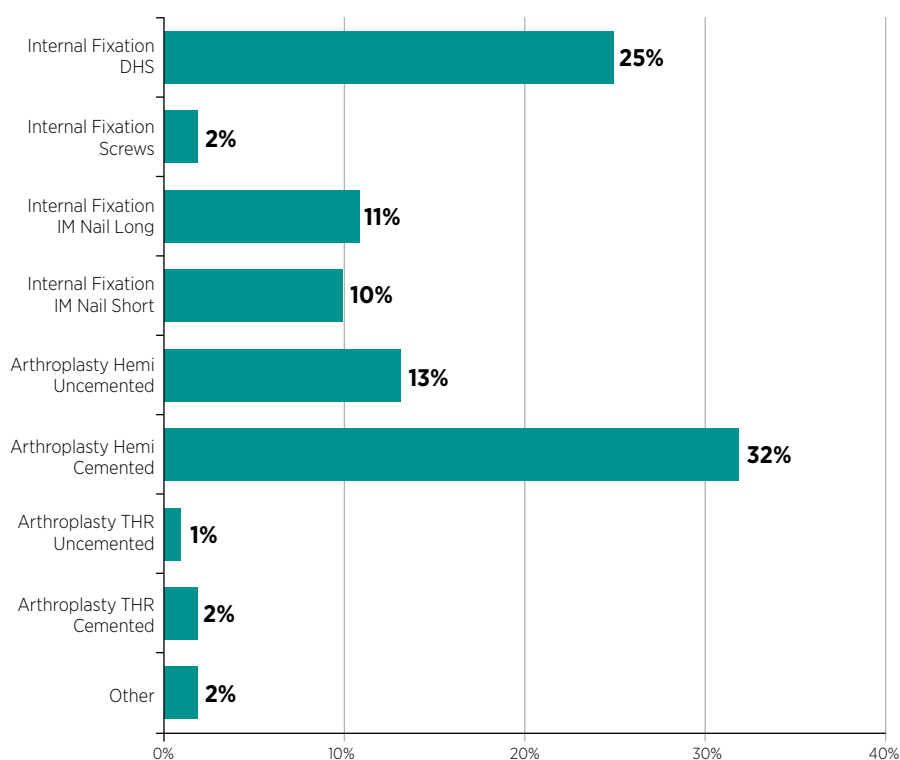
Figure 20 shows that 32% of patients underwent 'arthroplasty hemi cemented', followed by 'internal fixation DHS' (25%). Twenty-one percent of patients received an intra-meduallary nail either short (10%) or long (11%). As expected, these data show that the fixation varied by fracture type with hemi-arthroplasties being the most common surgery for both displaced and undisplaced intracapsular fracture, and internal fixation procedures were more common for the extracapsular fracture types (intertrochanteric and subtrochanteric).

### CLINICAL COMMENTARY

Accurate and well performed surgery, performed by an appropriate senior surgeon to establish stable fracture fixation that most importantly enables the patient to full weight bear and mobilise early is recommended by the National Model of Care for Trauma and Orthopaedic Surgery (2015).

**BEGINNING IN 2016, THE IHFD HAS STARTED COLLECTING DETAILS OF THE TYPE OF IMPLANT USED. THESE DATA WILL ALLOW IDENTIFICATION OF VARIABILITY AND TRENDS IN TREATMENT AND ENSURE EARLY IDENTIFICATION OF POTENTIAL ISSUES WITH NEW OR EXISTING IMPLANTS**

**FIGURE 20: TYPE OF SURGERY PERCENTAGES (n=3,029) <sup>(xi)</sup>**



<sup>xi</sup> Please note: Percentages may not sum to 100% due to rounding

## TYPE OF SURGERY FOR UNDISPLACED INTRACAPSULAR FRACTURES

### FINDINGS

Thirty-eight (38%) of patients underwent cemented hemi-arthroplasties and 11% underwent uncemented hemiarthroplasties, Figure 21.

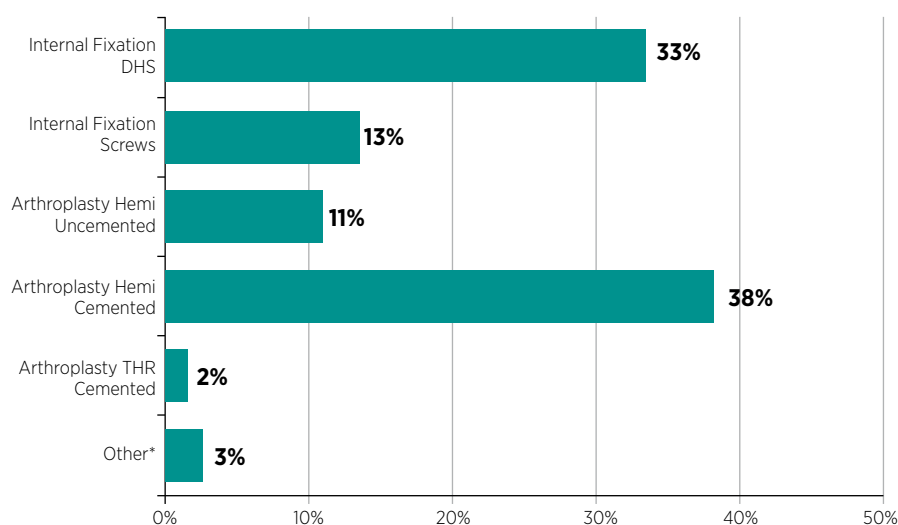
### CLINICAL COMMENTARY

There appears to be a 13 percentage point decrease in the number of patient receiving hemiarthroplasties compared to 2015, there is an increase of 9 percentage points for patients receiving 'internal fixation DHS' (33%) and an 7 percentage point increase in the number of patients receiving 'internal fixation screws' (13%). This change from last years report may be due to the fact that there are low numbers included in this field.

The percentage of patients undergoing total hip replacement remains very low at 2%.

There has been an 9% increase in uncemented hemi-arthroplasty compared to last report and a corresponding 10% reduction in cemented hemiarthroplasties performed.

**FIGURE 21: TYPE OF SURGERY FOR UNDISPLACED INTRACAPSULAR FRACTURES**  
PERCENTAGES (n=233)



*Other includes: Internal Fixation IM Nail Short, Internal Fixation IM Nail Long, Arthroplasty THR Uncemented due to confidentiality reasons.*

## TYPE OF SURGERY FOR DISPLACED INTRACAPSULAR FRACTURES

### FINDINGS

Eighty-seven percent (87%) of patients underwent a hemi-arthroplasty for displaced intracapsular fractures – 60% cemented and 27% uncemented, Figure 22. There was a one percentage point increase in the number of patients receiving a total hip arthroplasty (6%).

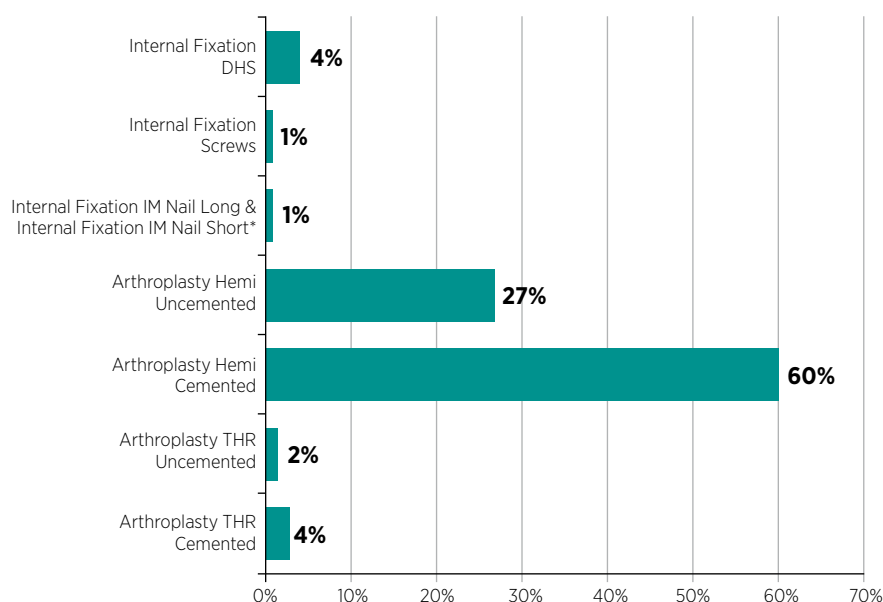
### CLINICAL COMMENTARY

In comparison to the last report, a 7% increase in the use of uncemented hemi arthroplasty and a 9% reduction in cemented hemi-arthroplasty was recorded.

The percentages of patients undergoing a total hip arthroplasty is low at 6%.

Appropriate patients for total hip replacement are classified in the NICE guidelines as able to walk independently out of doors with no more than the use of a stick, not cognitively impaired and medically fit for anaesthesia and the procedure (NICE, 2011). In the UK, 27% of patients who met the above criteria with a displaced intracapsular fracture underwent a total hip replacement in 2015 (NHFD, 2016).

**FIGURE 22: TYPE OF SURGERY FOR DISPLACED INTRACAPSULAR FRACTURES**  
PERCENTAGES (n=1,344) <sup>(xii)</sup>



\*Includes 'Other' due to confidentiality reasons

<sup>xii</sup> Please note: Percentages may not sum to 100% due to rounding.

## TYPE OF SURGERY FOR DISPLACED INTERTROCHANTERIC FRACTURES

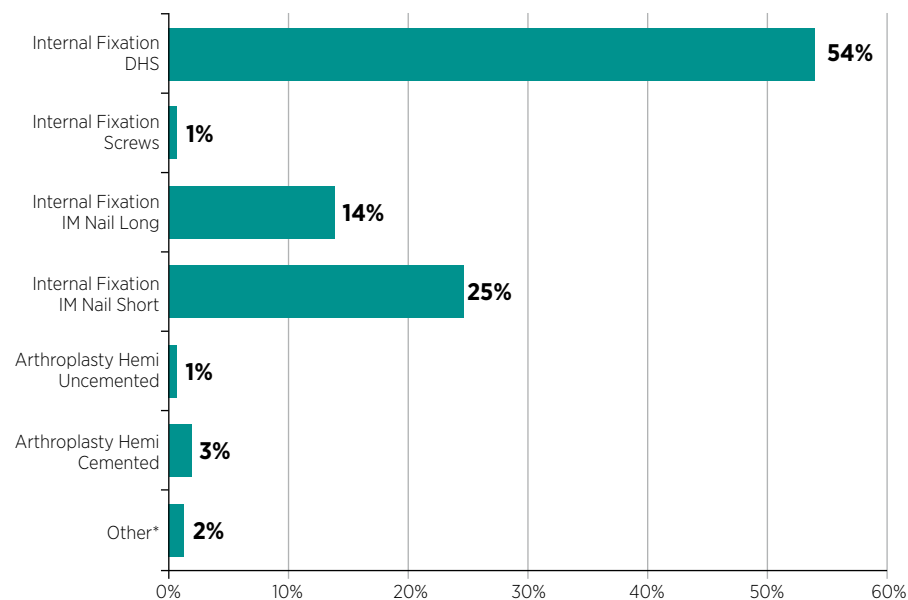
### FINDINGS

As would be expected, most (95%) patients with intertrochanteric fractures underwent internal fixation, Figure 23. Fifty-four percent (54%) (n=597) underwent a DHS and 39% (n=432) receiving an intramedullary nail (14% long and 25% short).

### CLINICAL COMMENTARY

These data is nearly identical to the previous report. This indicates a maturing of data quality. The use of intramedullary fixation for this fracture type is similar to last years report.

**FIGURE 23: TYPE OF SURGERY FOR INTERTROCHANTERIC FRACTURES**  
PERCENTAGES (n=1,097)



\*Includes Arthroplasty THR Cemented due to confidentiality reasons.

## TYPE OF SURGERY FOR DISPLACED SUBTROCHANTERIC FRACTURES

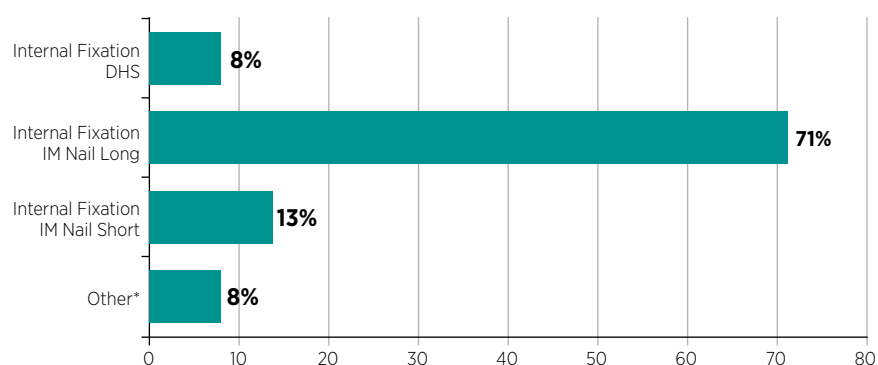
### FINDINGS

As would be expected, internal fixation was performed in the majority (92%) of subtrochanteric fractures, Figure 24.

### CLINICAL COMMENTARY

Long nails dominated this fixation type 71% (n=161) with short nails being performed in 13% (n=29) of cases and 8% (n=18) receiving a DHS.

**FIGURE 24:** TYPE OF SURGERY FOR SUBTROCHANTERIC FRACTURES  
PERCENTAGES (n=226)



*\*Includes Internal Fixation Screws, Arthroplasty Hemi Cemented, Arthroplasty THR Cemented due to confidentiality reasons.*

## CEMENTING OF ARTHROPLASTIES

### SOURCE:

NICE Clinical Guideline 124 (2011) recommends the use of cemented implants in patients undergoing arthroplasty.

### FINDINGS

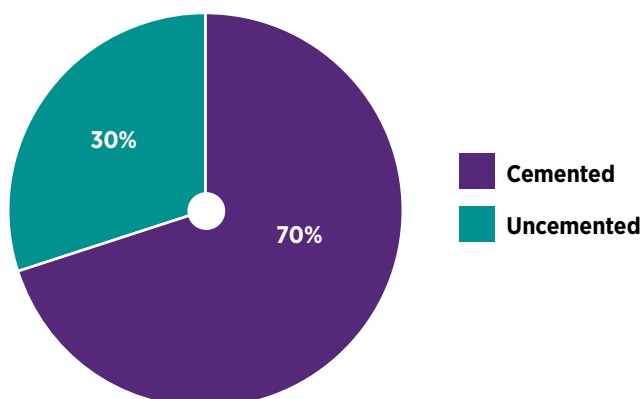
Seventy percent (70%) (n=1,055) of arthroplasties conducted were cemented, Figure 25.

### CLINICAL COMMENTARY

Cementing of arthroplasties is the recommended treatment for patients undergoing hip arthroplasty.

There needs to be consideration given when considering using cemented arthroplasties. Guidelines published by the Association of Anaesthetists of Great Britain and Ireland: Reducing the risk from cemented arthroplasty for hip fracture (Griffiths et al., 2015) give recommendations for both surgeons and anaesthetists in the prevention and management of bone cement implantation syndrome.

**FIGURE 25: CEMENTING OF ARTHROPLASTIES PERCENTAGES (n=1,499)**



## CHAPTER 4

# OUTCOMES



# 77%

OF HIP FRACTURE PATIENTS  
WERE MOBILISED ON THE DAY OF  
OR DAY AFTER SURGERY

## CHAPTER 4: OUTCOMES

### MOBILISATION: DAY OF OR DAY AFTER SURGERY AND MOBILISED BY

#### FINDINGS

Figure 26 shows that 77% (n=2,325) of patients were mobilised on the day of or day after surgery. This is an increase of 4 percentage points from 2015. Of those mobilised on day of, or day after surgery, 2,158 (93%) were mobilised by a physiotherapist.

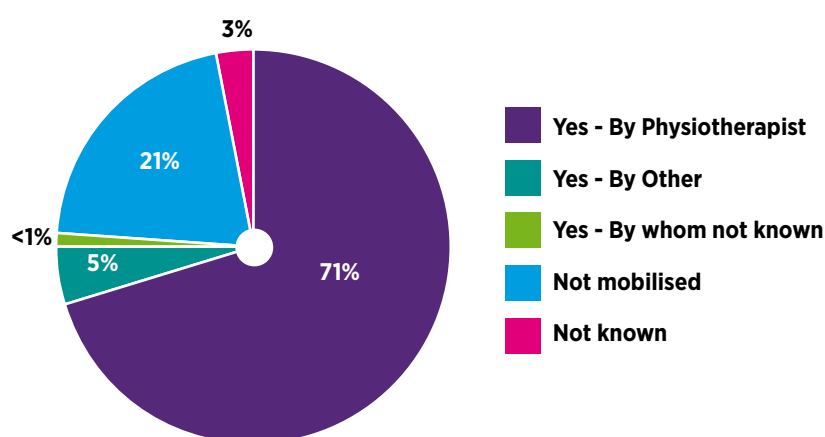
#### SEVENTY-EIGHT PERCENT (78%) (N=2,325) OF PATIENTS WERE ASSESSED ON THE DAY OF OR DAY AFTER SURGERY BY A PHYSIOTHERAPIST

#### CLINICAL COMMENTARY

Early mobilisation of hip fracture patients leads to better outcomes (Boonen et al., 2004; Dubljanin-Raspopovic et al., 2013; Hirose et al., 2010). The proportion of patients mobilised on the day of/after surgery has improved 4 percentage points since last year's report. It is not possible to determine from the current dataset what factors influenced a patient's ability to mobilise on that day.

International guidelines recommend all hip fracture patients receive a physiotherapy assessment on the day of/after surgery (ANZHFR, 2014; NICE, 2011; SIGN, 2009; Waddell, 2011). This is the first year that this information has been collected in the IHFD. Almost 21% (n=624) of patients did not receive a timely physiotherapy assessment. The national hip fracture facilities audit shows that while all sixteen centres have a physiotherapy service Monday – Friday, only 6 out of 16 have a weekend physiotherapy service (two of which just on a Saturday). It is important to acknowledge that access to physiotherapy services remains suboptimal.

**FIGURE 26: MOBILISATION PERCENTAGES (n=3,029) <sup>(XIII)</sup>**



<sup>xiii</sup> Please note: Percentages may not sum to 100% due to rounding.

## FUNCTIONAL OUTCOMES: CUMULATIVE AMBULATORY SCORE

### FINDINGS

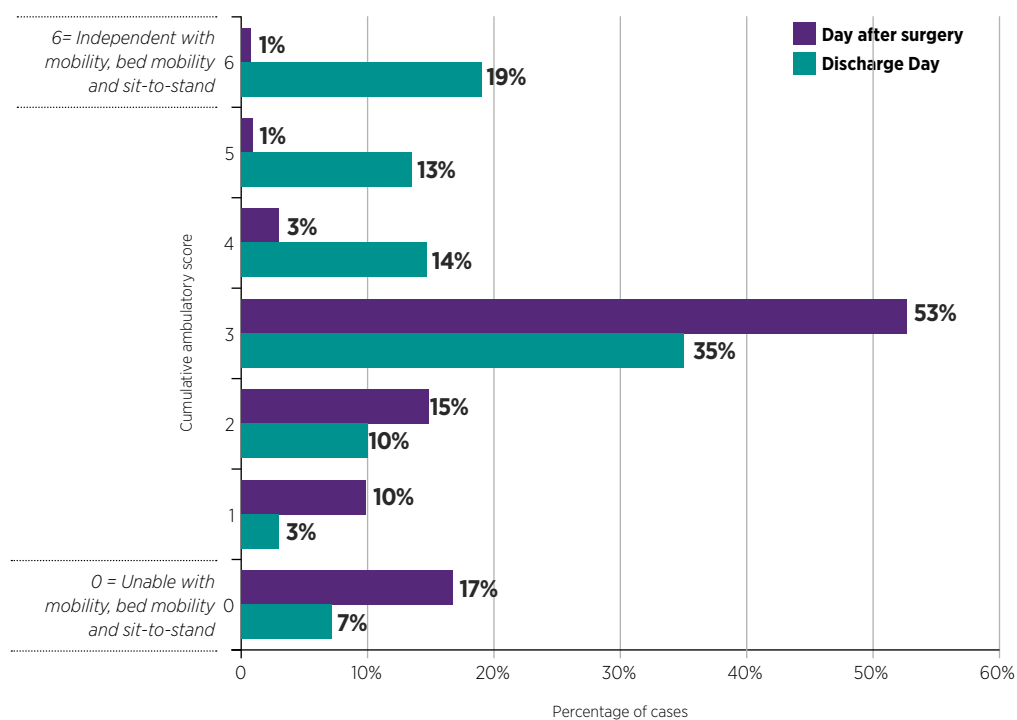
There are high levels of missing data for these data-fields (59% (n=1,800) missing on first postoperative day and 77% (n=2,322) missing for hospital discharge. For the patients which were reported on, 92% required assistance in their basic mobility (CAS≤3) on the first postoperative day, with 18% achieving independence in basic mobility (CAS=6) on hospital discharge. Direct comparison between CAS scores on first post-operative and discharge days was possible for n=649 patients who had complete data (Figure 27). For this group, the proportion of patients achieving independence in basic mobility rose from 5% to 46%.

### CLINICAL COMMENTARY

The Cumulated Ambulatory Score (CAS) was introduced to the IHFD for 2016 to capture postoperative functional outcome. It is an objective measure validated in a hip fracture population (Kristensen et al., 2009; Kristensen et al., 2012), that determines a patient's ability to perform three basic mobility tasks: (1) getting in and out of bed (2) sitting down and standing up (3) walking with or without a mobility aid. Each task obtains a score on a 3-point scale. The scores for each task are combined to provide a total score between 0 and 6, where 6 signifies independence in all three tasks and 0 signifies inability to perform any of the basic mobility tasks despite assistance.

The high level of missing data in relation to this new measure (introduced in 2016) limits any interpretation of these results. More complete data for these data-fields in 2017 will help provide an accurate profile of acute functional outcome post hip fracture.

**FIGURE 27: CUMULATED AMBULATORY SCORE PERCENTAGES (n=649)<sup>(xiv)</sup>**



<sup>xiv</sup> Please note: Percentages may not sum to 100% due to rounding.

## DEVELOPMENT OF PRESSURE ULCERS

### BLUE BOOK STANDARD 3:

ALL PATIENTS WITH HIP FRACTURE SHOULD BE ASSESSED AND CARED FOR WITH A VIEW TO MINIMISING THEIR RISK OF DEVELOPING A PRESSURE ULCER - PERCENTAGE OF PATIENTS WHO DEVELOPED A NEW PRESSURE ULCER.

### SOURCE:

British Orthopaedic Association (BOA) and British Geriatrics Society (BGS), 2007. 'Blue Book' The care of patients with fragility fracture (BOA and BGS, 2007).

### FINDINGS

Of those patients who were discharged alive, 5% (n=135) had pressure ulcers, Figure 28.

### CLINICAL COMMENTARY

A pressure ulcer is localised injury to the skin and/or underlying tissue usually over a bony prominence, as a result of pressure, or pressure in combination with shear. A number of contributing or confounding factors are also associated with pressure ulcers; the significance of these factors is yet to be elucidated (EUPAP and NPUAP, 2009).

Patients should be assessed and cared for throughout their admission to minimise their risk of developing a pressure ulcer. For the purpose of this report, pressure ulcers Stage 2 or higher that developed after admission and no later than 120 days after admission are included. Due diligence should be paid to the documentation of pressure ulcer incidence (See Appendix 4).

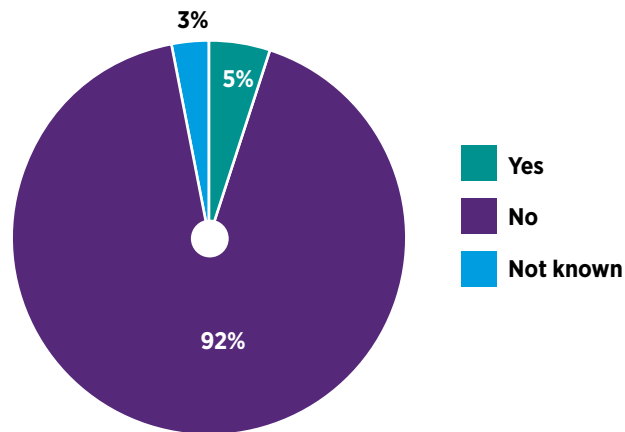
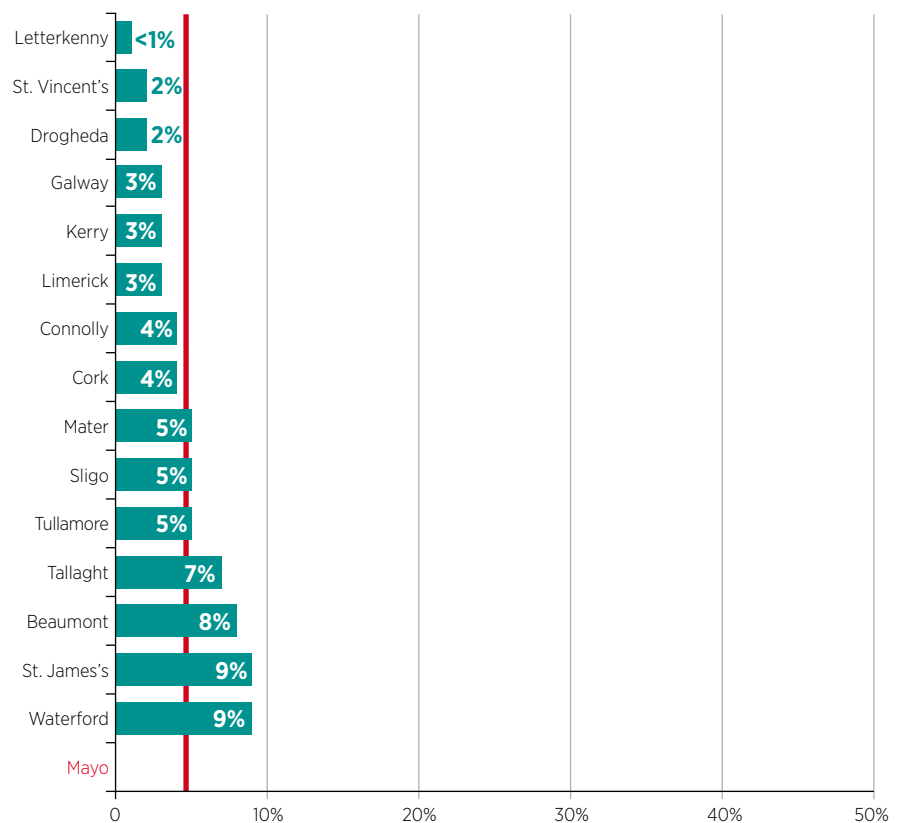
The National Model of Care for Trauma and Orthopaedic Surgery (2015) recommends that in order to prevent pressure ulcers, all hip fracture patients should be rested on pressure reducing surfaces from the point of admission to hospital; in transit; in theatre; and in the ward, where high specification, pressure relieving mattresses should be readily available.

The Department of Health (DOH) is currently working on the introduction of a Key Performance Indicator (KPI) for pressure ulcers in all hospitalised patients.

The National Quality Improvement Programme has delivered two Pressure Ulcers to Zero collaboratives that have focused on preventing pressure ulcers within acute, community and primary care settings. The key safety intervention used within the collaboratives is the SSKIN bundle.

The percentage of "Not Known" values remains at 3%. Ongoing education and the addition of definitions to the IHFD portal has seen the completeness for this data item improve.

The range in pressure ulcer percentage by hospital was from (<1%- 9%), Figure 28A.

**FIGURE 28: PRESSURE ULCER PERCENTAGES (n=2,992)****FIGURE 28A: PRESSURE ULCER INCIDENCE BY HOSPITAL (n=2,882)**

*Mayo University Hospital has been excluded from the analysis of this hospital comparison graph as they did not enter sufficient data.*

*The red line indicates the national average.*

## BONE HEALTH ASSESSMENT/BONE PROTECTION MEDICATION ON DISCHARGE

### BLUE BOOK STANDARD 5:

ALL PATIENTS PRESENTING WITH A FRAGILITY FRACTURE SHOULD BE ASSESSED TO DETERMINE THEIR NEED FOR BONE PROTECTION THERAPY TO PREVENT FURTHER OSTEOPOROTIC FRACTURES.

### SOURCE:

British Orthopaedic Association (BOA) and British Geriatrics Society (BGS), 2007. 'Blue Book' The care of patients with fragility fracture (BOA and BGS, 2007).

### FINDINGS

Bone protection was commenced on 43% of patient during their hospital admission - this is an increase of 9 percentage points from 2015, Figure 29. Twenty percent (20%) received no assessment which is a 5 percentage point reduction from 2015.

### CLINICAL COMMENTARY

In total, 77% patients had their bone health assessed or medication prescribed on discharge. 57% met the Blue Book Standard.

The National Model of Care for Trauma and Orthopaedic Surgery (2015) recommends there should be a fracture liaison service in each of the sixteen trauma units and a properly resourced orthogeriatric service to manage the older fragility fracture patients during the acute hospital episode of care in order to provide secondary prevention of further falls and fractures.

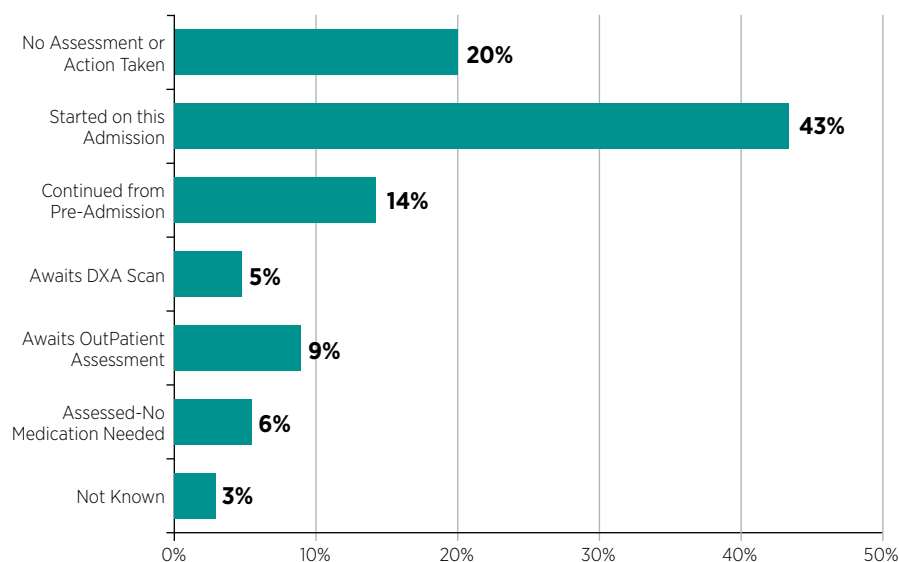
Twenty-two percent (22%) of patients were recorded as having a previous fragility fracture.

Ninety-four percent (94%) of these fractures resulted from a low energy trauma (See Appendix 7) and should carry a high suspicion of osteoporosis until proven otherwise. It should be expected that a much higher portion of patients would have bone protection.

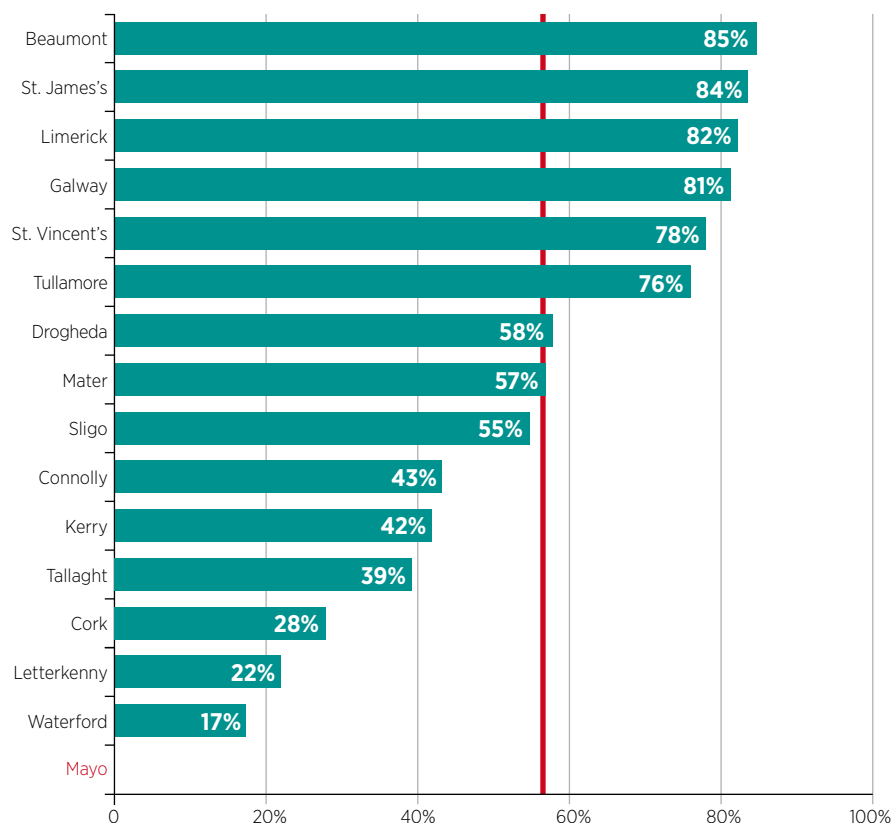
The proportion of patients meeting the Blue Book Standard 5 at an individual hospital level ranges from 17%-85%, Figure 29A.

There is a clear correlation between the level of compliance with this standard and the level of either Orthogeriatric or fracture liaison services in the individual hospitals (See Chapter 5 for facilities audits).

**FIGURE 29: BONE HEALTH ASSESSMENT/ BONE PROTECTION MEDICATION PERCENTAGES (n=2,992)**



**FIGURE 29A: BONE HEALTH ASSESSMENT / BONE PROTECTION MEDICATION BY HOSPITAL (n=2,976)**



*Mayo University Hospital has been excluded from the analysis of this hospital comparison graph as they did not enter sufficient data.*

*The red line indicates the national average.*

## SPECIALIST FALLS ASSESSMENT

### BLUE BOOK STANDARD 6:

ALL PATIENTS PRESENTING WITH A FRAGILITY FRACTURE FOLLOWING A FALL SHOULD BE OFFERED MULTI-DISCIPLINARY ASSESSMENT AND INTERVENTION TO PREVENT FALLS.

### SOURCE:

British Orthopaedic Association (BOA) and British Geriatrics Society (BGS), 2007. 'Blue Book' The care of patients with fragility fracture (BOA and BGS, 2007).

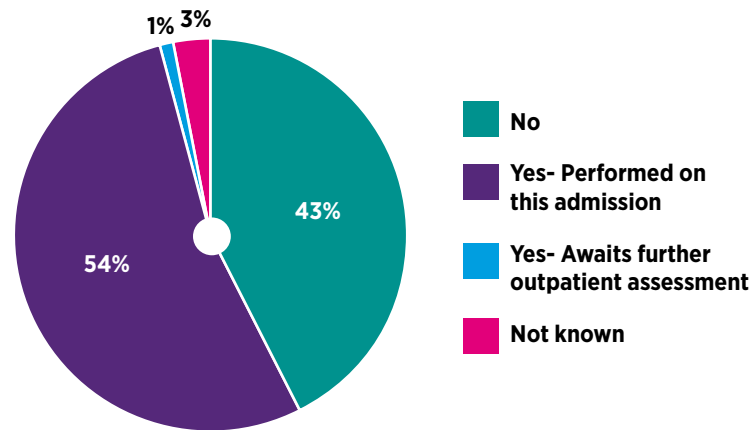
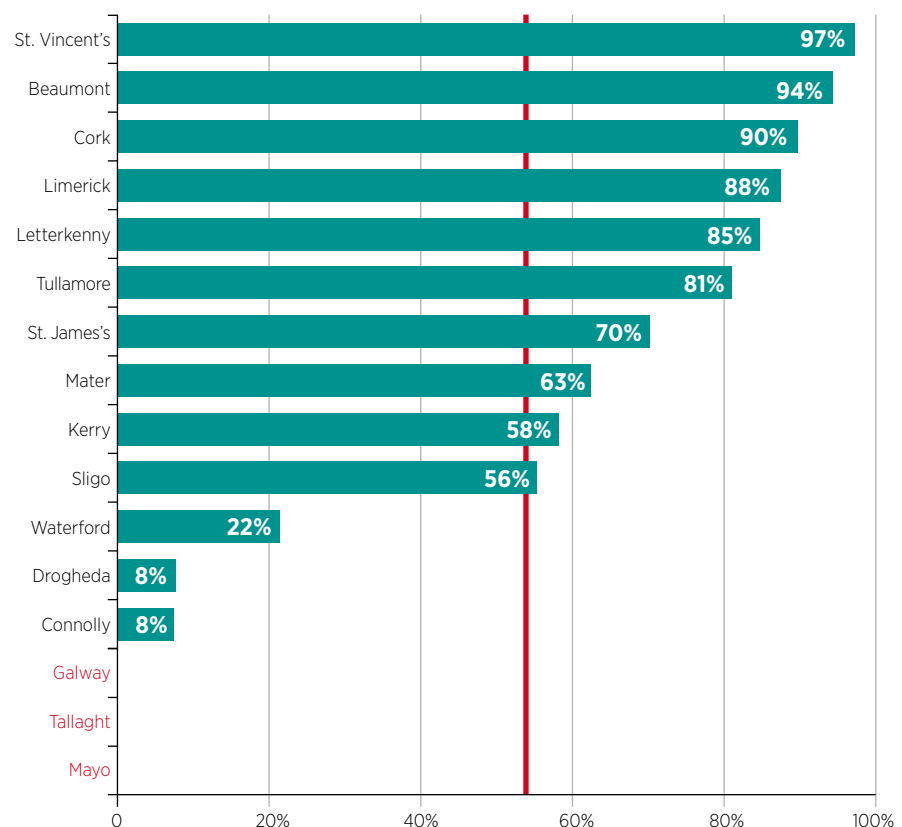
### FINDINGS

Prior to discharge, 54% of patients (n=1,604) had a falls assessment during their admission; this is a seven percentage point improvement from 2015, Figure 30.

### CLINICAL COMMENTARY

Patients who fall are more likely to fall again and those who fracture are more likely to fracture again. Ninety-four percent (94%) of patients sustained their hip fracture as a result of low energy trauma (See Appendix 7). A systematic falls assessment should be offered to all patients who presented with a 'low trauma fall' by a suitably trained person i.e. geriatrician, falls nurse specialist. A falls assessment should include a falls history (noting previous falls), cause of index fall (including medication review), risk factors for falling and injury (including fracture) and from that information formulate and document a plan of action to prevent further falls (See Appendix 2).

There is huge variability in the level of service being provided in the sixteen trauma hospitals from (1% - 97%) this again is directly resulting from the level of orthogeriatric services and falls services in the varying hospitals, Figure 30A. Given the level of risk of falling for this group of patients, there is no acceptable reason for these patients not to meet the standard.

**FIGURE 30: SPECIALIST FALLS ASSESSMENT PERCENTAGES (n=2,992)****FIGURE 30A: SPECIALIST FALLS ASSESSMENT BY HOSPITAL (n=2,976)**

*Mayo University Hospital has been excluded from the analysis of this hospital comparison graph as they did not enter sufficient data.*

*University Hospital Galway and Tallaght Hospital are not itemised separately as they entered data for less than 5 patients.*

*The red line indicates the national average.*

## DESTINATION ON DISCHARGE

### FINDINGS

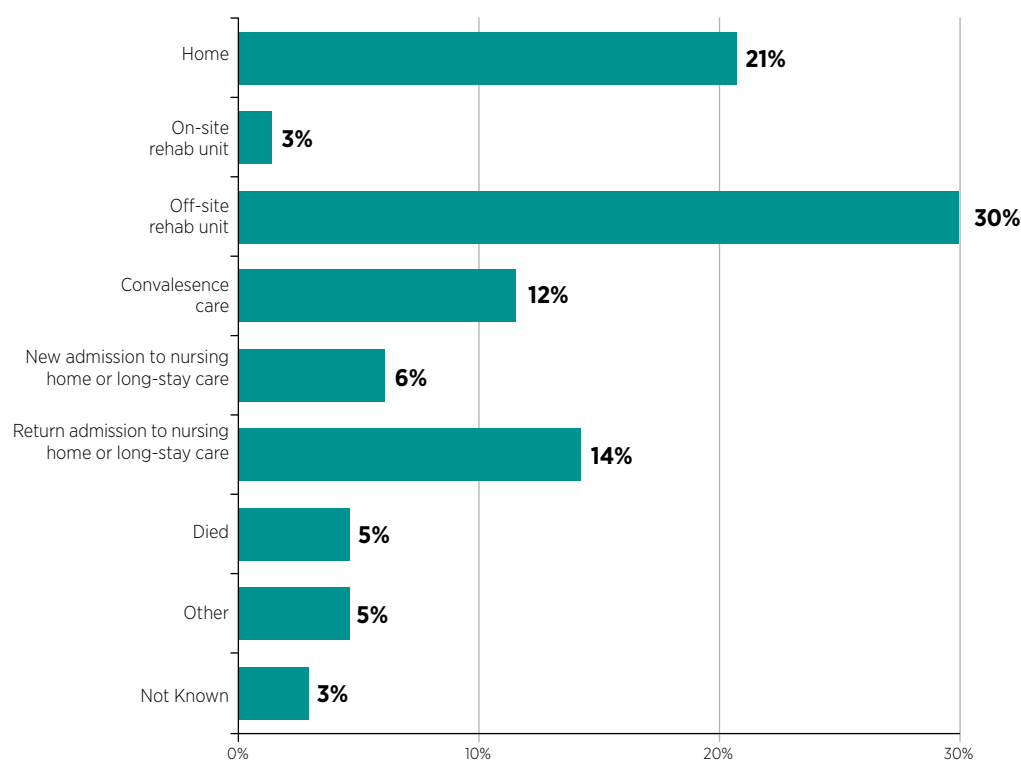
Figure 31 shows that 21% of patients were discharged directly home from hospital. Thirty-three percent (33%) required rehabilitation at an on-site or off-site rehabilitation unit.

### CLINICAL COMMENTARY

In 2016, the IHFD added a new field to capture information about destination on discharge. HIPE data was used in the previous IHFD reports to show destination on discharge. In previous reports, this data could not show the exact number of patients going for rehabilitation or going to nursing home or long stay care as a new admission.

The IHFD data shows that 14% of patients were recorded as being a return admission to nursing home or long stay care, this is 5% higher than indicated from the source of admission data in Figure 5.

**FIGURE 31: DESTINATION ON DISCHARGE PERCENTAGES (N=3,159)<sup>(xv)</sup>**



<sup>xv</sup> Please note: Percentages may not sum to 100% due to rounding.

## CUMULATIVE LENGTH OF STAY (LOS)

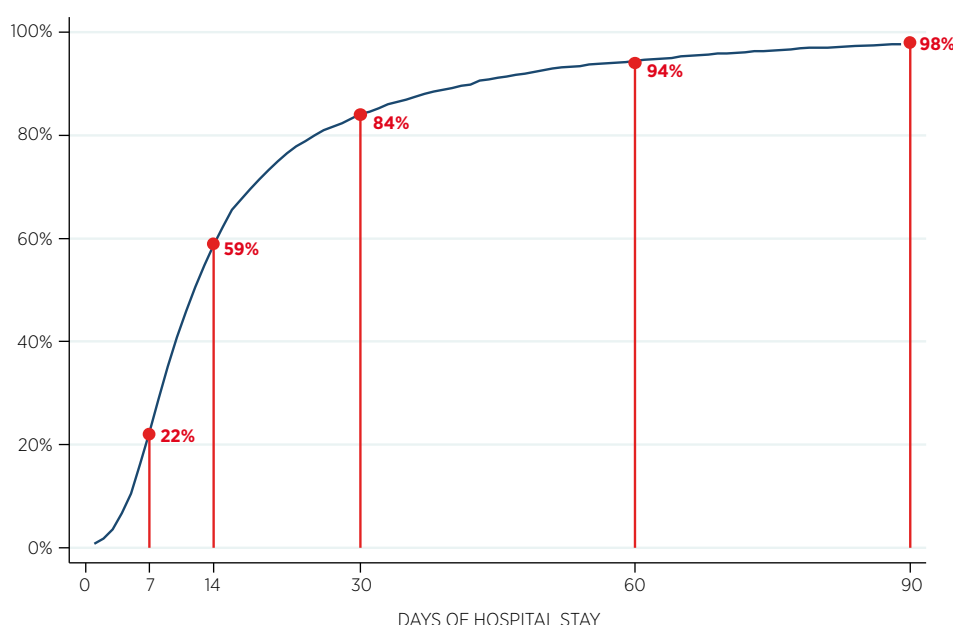
### FINDINGS

Length of stay is measured on HIPE as the number of calendar days from the date the patient is admitted to a ward in the operating hospital to the date the patient is discharged from the operating hospital. Figure 32 shows cumulative percentages for all lengths of stay; 22% were discharged within a week and 59% within a fortnight. The mean and median length of stay for hip fracture patients were 20 and 12 days respectively.

### CLINICAL COMMENTARY

Length of stay is used as a surrogate marker of the efficiency of a trauma service. The median length of stay decreased by one day.

**FIGURE 32: CUMULATIVE LENGTH OF STAY (LOS) PERCENTAGES (N=3,159)**



## RE-OPERATION WITHIN 30 DAYS

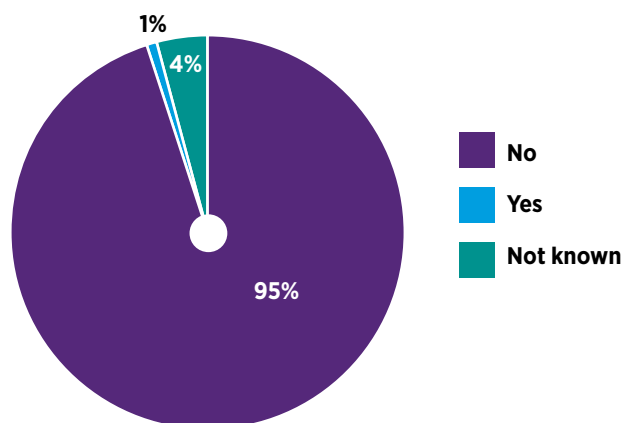
### FINDINGS

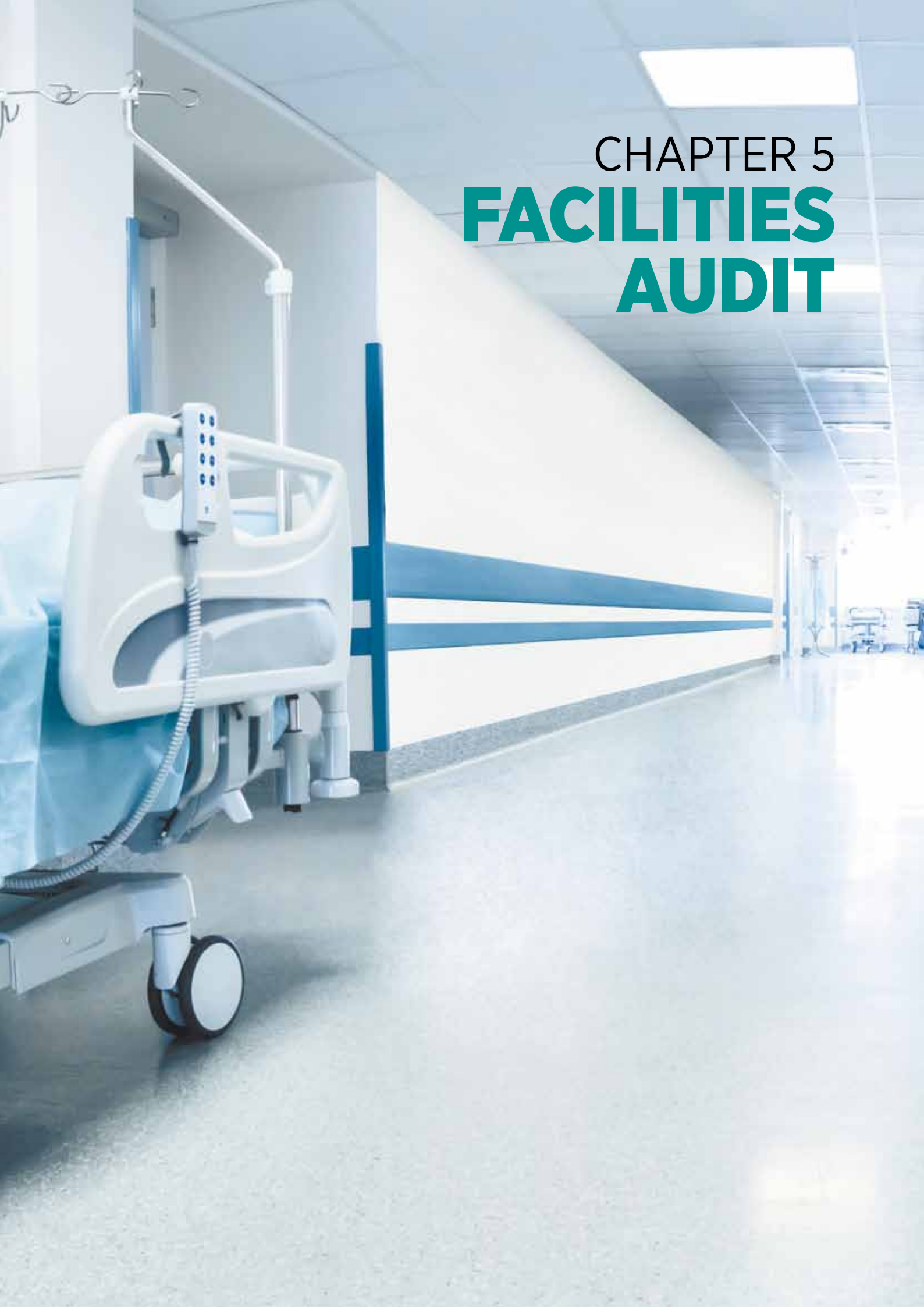
Ninety-five (95%) of patients did not have any further surgery within 30 days in the operating hospital, Figure 33. There is an improvement of two percentage points in the number of cases documented as 'not known' from 2015 representing improving data quality for this field.

### CLINICAL COMMENTARY

This field is essentially a surrogate marker for the quality of the initial operation and perioperative care. Until unique health identifiers are introduced in Ireland, it will be difficult to accurately reflect the true number of re-operation within 30 days. This is due to the potential for patients to be re-admitted to a different hospital than the one they presented to for their initial hip fracture surgery.

**FIGURE 33: RE-OPERATION WITHIN 30 DAYS PERCENTAGES (n=3,029)**



A photograph of a long, brightly lit hospital hallway. On the left, a white gurney with blue wheels and a control panel is partially visible. The hallway has white walls with two horizontal blue stripes. The floor is a light-colored, polished material that reflects the overhead fluorescent lights. In the distance, other medical equipment and the end of the hallway are visible.

## CHAPTER 5 **FACILITIES AUDIT**

## CHAPTER 5: FACILITIES AUDIT

TABLE 5: SUMMARY OF FACILITIES AUDIT

## DEMOGRAPHICS

Hospital Name	Beaumont	Connolly	Cork	Galway	Kerry	Letterkenny	Limerick	Mater	Mayo	Drogheda	Sligo	St James's	St Vincent's	Tallaght	Tullamore	Waterford
Number of Hip Fracture Cases per year 60+	188	145	476	233	129	133	320	181	126	264	129	175	299	178	221	413
% Completeness of data entry for 2016	96	99	50	98	98	95	92	72	11	99	95	96	97	99	100	93

## HOSPITAL RESOURCES

Hospital Name	Beaumont	Connolly	Cork	Galway	Kerry	Letterkenny	Limerick	Mater	Mayo	Drogheda	Sligo	St James's	St Vincent's	Tallaght	Tullamore	Waterford
Trauma Service Description	Direct	Direct & Indirect	Direct	Direct & Indirect	Direct	Direct	Direct	Direct & Indirect	Direct	Direct & Indirect	Direct	Direct	Direct & Indirect	Direct & Indirect	Direct	Direct & Indirect
Number of trauma beds	35	31 shared with Urology	25	32	30 bed ward with elective and trauma mixed	37	29	30	32	18	12 beds	31	40 (10 in Acute Orthopaedic Unit)	35	31	59 (two wards)
Dedicated HIP Bed	Yes	Yes	No	No	No	No	Yes	No	No	No	No	Yes	Yes	No	Yes	No
Acute admission to	Orthopaedic Ward	Orthopaedic Ward	Ortho bed post-op	Orthopaedic Ward	Orthopaedic /surgical Ward	Orthopaedic Ward	Orthopaedic Ward/any ward depending on capacity	Any ward	Orthopaedic Ward	Orthopaedic Ward	Orthopaedic Ward	Orthopaedic Ward	AOU bed, or Orthopaedic Ward	Orthopaedic Ward	Orthopaedic Ward	Orthopaedic Ward
Hours of designated trauma trauma / week	40	28	126	168	6	0	40	168	0	70	20	54	42.5	63	45	81
Dedicated trauma theatre at weekends	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Are hip fractures prioritised on the theatre list	Yes	Yes	Yes	Yes	No	No	No	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Number of orthopaedic doctors	4 Consultant 4 SpR/ Registrar 4 NCHD	4 Consultant 4 SpR/ Registrar 4 NCHD	8 Consultant 8 SpR/ Registrar 3 NCHD	10 Consultant 10 SpR/ Registrar 7 NCHD	3 Consultant 5 SpR/ Registrar 7 NCHD	4 Consultant 4 SpR/ Registrar 6 NCHD	6 Consultant 7 SpR/ Registrar 8 NCHD	4.80 Consultant 6 SpR/ Registrar 8 NCHD	3 Consultant 7 SpR/ Registrar 7 NCHD	9 Consultant 10 SpR/ Registrar 12 NCHD	5 Consultant 5 SpR/ Registrar 6 NCHD	4 Consultant 5 SpR/ Registrar 4 NCHD	6 Consultant 5 SpR/ Registrar 6 NCHD	4.3 Consultant 7 SpR/ Registrar 6 NCHD	5.06 Consultant 5 SpR/ Registrar 7 NCHD	8 Consultant 7 SpR/ Registrar 13 NCHD

TABLE 5: SUMMARY OF FACILITIES AUDIT

## HOSPITAL RESOURCES (CONTINUED)

Hospital Name	Beaumont	Connolly	Cork	Galway	Kerry	Letterkenny	Limerick	Mater	Mayo	Drogheda	Sligo	St James's	St Vincent's	Tallaght	Tullamore	Waterford
Number of hours per week orthogeriatric input	3.5-5 Consultant	0	0	0	2 Consultant	0	8 Consultant 30 SpR / Registrar	0	0	0	0	2 Consultant 4.5 SpR	10.5 Consultant 27 SpR Registrar	0	6 Consultant	30 SpR
Number of WTE clinical nurse specialists specialising in fragility fracture	0	0	0	0.5	0	0	0	1	0	0	0	1.5	0	0	0	0
Number of WTE fracture liaison nurses	0	0	0	0.5	0	1	0	0	0	0	1	1.5	0.5	1	0	0.5
Number of nursing staff in the orthopaedic department	ANP 0 CNM3 0 CNM2 1 CNM1 2 Staff Nurse 18	ANP 0 CNM3 0 CNM2 1 CNM1 1 Staff Nurse 24	ANP 0 CNM3 0 CNM2 2 CNM1 1 Staff Nurse 21	ANP 0 CNM3 0 CNM2 1 CNM1 1.5 Staff Nurse 23.5	ANP 0 CNM3 0 CNM2 1 CNM1 1 Staff Nurse 21.7	ANP 0 CNM3 0 CNM2 3 CNM1 0 Staff Nurse 26	ANP 1 CNM3 0 CNM1 1 CNM1 1 Staff Nurse 28	ANP 0 CNM3 1 CNM2 1 CNM1 1 Staff Nurse 20	ANP 0 CNM3 0 CNM2 1 CNM1 1 Staff Nurse 28	ANP 0 CNM3 1 CNM2 1 CNM1 1 Staff Nurse 17.5	ANP 0 CNM3 0 CNM2 1.5 CNM1 0 Staff Nurse 18.6	ANP 0 CNM3 0 CNM2 1 CNM1 0 Staff Nurse 19	ANP 0 CNM3 1 CNM2 1 CNM1 2 Staff Nurse 13	ANP 0 CNM3 1 CNM2 1 CNM1 1 Staff Nurse 32	ANP 0 CNM3 0 CNM2 1 CNM1 2 Staff Nurse 15.94	ANP 0 CNM3 0.5 CNM2 2 CNM1 2 Staff Nurse 35
Nursing staff / patient ratio on the orthopaedic department in the am/ pm and on night duty	AM 6 PM 5 NIGHT 4	AM 7 PM 7 NIGHT 3	AM 4-5 PM 4-5 NIGHT 3	AM 5-6 PM 4 NIGHT 3	AM 6 PM 4 NIGHT 4	AM 6 PM 5-6 NIGHT 3-4	AM 7 PM 6 NIGHT 4	AM 1-4 PM 1-4 NIGHT 1:6:6	AM 6 PM 6 NIGHT 4	AM 5 PM 4 NIGHT 2	AM 6-7 PM 3-4 NIGHT 3	AM 4-5 PM 4-5 NIGHT 3	AM 4-5:40 PM 4-5:40 NIGHT 4:40	AM 5-6 PM 5-6 NIGHT 4	AM 4 PM 4 NIGHT 3	AM 5-6 PM 4 NIGHT 3
How many staff in the department have higher education in orthopaedics	2	3 2 in progress	2	4	1	3	12	0	15	4	1	1	13	9	12	4 3 in progress
No. of HCA's am/pm and on night duty	AM 3 PM 3 NIGHT 1 (until midnight)	AM 1 PM 1 NIGHT 1	AM 1 PM 1 NIGHT 1	AM 2 PM 2 NIGHT 1	1 WTE (39 hours)	AM 4 PM 2 NIGHT 1	AM 2 PM 1-2 NIGHT 1	AM 2 PM 1 NIGHT 1	AM 2 PM 1 NIGHT 1	AM 2 PM 1 NIGHT 1	AM 1-2 PM 1 NIGHT 0	AM 2 PM 2 NIGHT 2	AM 3 PM 3 NIGHT 2	AM 1 PM 1 NIGHT 1	AM 2 PM 1 NIGHT 0	AM 2 PM 1 NIGHT 1
Mon-Fri WTE for PT and PTA	PT 2 PTA 1	PT 1.5 PTA 0	PT 2 PTA 0	PT 1.5 PTA 0.5-1	PT 2 PTA 0	PT 1.5 PTA 1	PT 1 PTA 0.5	PT 1 PTA 0	PT 2 PTA 1	PT 1.5 PTA 0.6	PT 1 PTA 0	PT 1.5 PTA 1	PT 2 PTA 1	PT 2 PTA 0.4	PT 1 PTA 0.5	PT 2 PTA 1
Mon-Fri WTE for OT and OTA	OT 1 OTA 0	OT 1 OTA 0	OT .5 OTA 0	OT 1.6 OTA 0.1	0	OT 1 OTA 0	OT 0.125 OTA 0.1	OT 0.4 OTA 0.1	OT 1 OTA 0	OT 1 OTA 0	OT 1 OTA 0	OT 0.5 OTA 0	OT 1 OTA 0	OT 1.6 OTA 0	OT 0.75 OTA 0.3	OT 1 OTA 0
Sat-Sun WTE for OT and OTA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE 5: SUMMARY OF FACILITIES AUDIT

## HOSPITAL RESOURCES (CONTINUED)

Hospital Name	Beaumont	Connolly	Cork	Galway	Kerry	Letterkenny	Limerick	Mater	Mayo	Drogheda	Sligo	St James's	St Vincent's	Tallaght	Tullamore	Waterford
Does PT service at weekends see Day 1 hip fracture patients?	Saturday Yes Sunday No	Saturday Yes Sunday Yes	Saturday No Sunday No	Saturday Yes Sunday Yes	Saturday No Sunday No	Saturday Yes Sunday Yes	Saturday Yes Sunday Yes	Saturday Yes Sunday No	Saturday Yes Sunday Yes	Saturday Yes Sunday Yes	Saturday No Sunday No	Saturday Yes Sunday Yes	Saturday No Sunday No	Saturday Yes Sunday Yes	Saturday No Sunday No	Saturday No Sunday No
Are non-Day 1 hip fracture patients mobilised on weekends	Yes	No	No	No	No	Yes	No	No	No	No	No	Yes	No	Yes	No	No
Rehabilitation sites – On-site or off-site?	Offsite	Offsite	Offsite	Both	Offsite	Onsite	Offsite	Offsite	Offsite	Offsite	Offsite	Both	Offsite	Offsite	Offsite	Offsite
Do you have a policy for nutritional assessment of patients?	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Do you have routine or consult based dietetic support within the department?	Consult	Consult	Consult	Consult	Consult	Consult	Consult	Consult	Consult	Consult	Routine	Consult	Consult	Routine	Consult	Consult
Do you have a falls clinic?	No	No	No	No	No	No	No	No	Yes	No	No	Yes	No	Yes but only for those patients discharged from ED following fall	Yes	Yes
Who carries out specialist falls assessment?	Consultant Geriatrician	MFTE/Frail Elderly Team	Consultant Geriatrician	Patients are referred to fragility services on a very limited basis.	Nursing & Physio	Fracture Liaison Nurse	Orthogeriatric Team	Geriatrician, falls nurse		Geriatrician	Consultant Orthogeriatrician	Geriatrician / Physio	Orthogeriatric consultant, Orthogeriatric registrar, Nursing staff, Pharmacist, Physiotherapist Occupational Therapist.	Consultant geriatrician and Specialist Falls Nurse but only outpatients. No inpatient falls service.	Physician with special interest in orthogeriatrics	Geriatrician
Are the hip fracture patients followed up in OPD and if so when?	Yes - 2 or 6 weeks post surgery	Yes - 6 weeks post op	Yes - 6 weeks post op	Yes - 6 weeks post op	Yes - 4-6 weeks post op	Yes - 6 weeks post op	Yes - 6 weeks post op	Yes by physio in OPD	Yes - 6 weeks post op	Yes - 6 weeks post op	Yes - 6 weeks post op	Yes - 6 weeks post op	Yes - 6 weeks post op	Yes as per consultant	Yes - 6 weeks post op	Yes - 6 weeks post op

TABLE 5: SUMMARY OF FACILITIES AUDIT

## HOSPITAL RESOURCES (CONTINUED)

Hospital Name	Beaumont	Connolly	Cork	Galway	Kerry	Letterkenny	Limerick	Mater	Mayo	Drogheda	Sligo	St James's	St Vincent's	Tallaght	Tullamore	Waterford
Who prescribes bone protection medication?	Consultant Geriatrician	Both orthopaedic and MFTE teams	Geriatrician	The interns following CNM assessment	Orthogeriatrician	Recommendation on sent to GP after DXA Scan	Orthogeriatric Team	Geriatrician	Consultant	NCHD's	Consultant Orthogeriatrician / GP's / Surgeons	Bone Health SPR/ortho geriatrician /MedEI Reg	Orthopaedic interns with support from Orthogeriatric Registrar/Consultant and ward Pharmacist	Consultant Geriatrician and Fracture Liaison Nurse in clinic	Physician with special interest in orthogeriatrics	Geriatrician as a consultant or FLS as an outpatient if referred
DXA on site?	Yes	No	Yes	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Who collects the data for the IHFD?	Staff Nurse	CNM2	Trauma Coordinator	Staff Nurse	Audit Facilitator	Fracture Liaison Nurse	CNM2 Orthopaedics	Geriatric Registrar	CNM3 Nursing Operations	Trauma Coordinator	Theatre Nurse	Trauma Nurse Coordinator	Orthopaedic CNS	Fracture Liaison Nurse	CNM2 Ortho Nurse OPD	Orthopaedic Nurse Specialist
How much WTE (in hours) is protected for the collection of the IHFD data?	15.6	0	0	0	8	1	0	0	0	7	4	6-8	0	0	6-8	7.5
Does the data coordinator have an office to collect the data in?	Yes	No	Yes	No	Yes	Yes	Yes	No	No	Yes	No	Yes	Yes	Yes	Yes	Yes

## POLICY &amp; PROCEDURES

Hospital Name	Beaumont	Connolly	Cork	Galway	Kerry	Letterkenny	Limerick	Mater	Mayo	Drogheda	Sligo	St James's	St Vincent's	Tallaght	Tullamore	Waterford
Do you have a defined pathway of care for hip fracture patients?	No	No	No	Yes	No	No	Yes	Yes	No	No	Yes	Yes	Yes	No	Yes	Yes
Is there a policy to fast track hip fracture patients through ED?	Yes	No	No	Yes	No	No	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes

TABLE 5: SUMMARY OF FACILITIES AUDIT

## LOCAL GOVERNANCE

Hospital Name	Beaumont	Connolly	Cork	Galway	Kerry	Letterkenny	Limerick	Mater	Mayo	Drogheda	Sligo	St James's	St Vincent's	Tallaght	Tullamore	Waterford
How often does the clinical lead meet with the data coordinator?	Monthly - bi-monthly	Weekly	Never	No regular meeting. Every few months	Periodically	Speciality meeting 3 monthly but contact at least weekly on ad hoc basis	As required available on site once a week	Monthly	Not formally	Every 2 months	Not formally	3 times a year and as required	Weekly	Weekly	Formally 6 times per year and as required Weekly	Weekly
How often and to whom is the data presented?		Quarterly	Quarterly	Never	Yearly Ortho Governance	Quarterly	Quarterly	Orthopaedic Group		Monthly	Quarterly	Quarterly	Quarterly	Quarterly	Annual report to the Hospital Management Team. Hip fracture group 3 times a year.	Quarterly
Is there a hip fracture governance group in the hospital?	Yes	Yes	No	No	No	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
If yes, are there leads representing Orthopaedics, ED, Anaesthetics, Geriatrics, AHP's, Nursing and senior hospital management on this group?	Yes	Yes	N/A	N/A	N/A	N/A	Yes	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Who chairs this group?	Surgical Directorate Nurse Manager	Mr Paddy Kenny, Consultant Orthopaedic Surgeon.	N/A	N/A	N/A	N/A	General Manager / Clinical Lead	Orthopaedic	N/A	Orthopaedic Consultant	N/A	Clinical Director of Surgery / ED Consultant / Orthopaedic Consultant	Mr. Conor Hurson, Consultant Orthopaedic Surgeon	Consultant Geriatrician with Clinical responsibility for falls	Ms Dorothy Niall, Clinical Lead	Ms. May Cleary Consultant Orthopaedic Surgeon
How often does the group meet?	Quarterly	Quarterly	N/A	N/A	N/A	N/A	Quarterly	Quarterly	N/A	Every 2 months	2-3 times per year	Bi-annually once recommended	Monthly	Ad hoc quarterly	Quarterly	Quarterly

A close-up, shallow depth-of-field photograph of a medical workspace. In the foreground, the silver, circular chest piece of a stethoscope rests on a bright blue surface. To the right, a stack of white papers is visible, with a yellow tab sticking out. In the background, a black computer keyboard is partially visible, slightly out of focus. A black tube, likely part of a stethoscope or medical equipment, curves across the upper portion of the frame. The overall lighting is bright and clinical.

# **REFERENCES & BIBLIOGRAPHY**

# REFERENCES & BIBLIOGRAPHY

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# APPENDICES



# APPENDIX 1: DATASET

HIPE Portal Data Entry / Hip Fracture Admission (V5.0.1) 13 Dec 2016

Question	Options
1. Date of trauma causing hip fracture	
1A. Time of trauma causing hip fracture	
2. Type of trauma	1 High energy trauma, 2 Low energy trauma 8 Unknown, 9 Not documented
3. Date of arrival at first presenting hospital	
3A. Time of arrival at first presenting hospital	
4. Admission via ED in operating hospital	1 Yes, 2 No
4A. Date of arrival in ED of operating hospital	
4B. Time of arrival in ED of operating hospital	
4C. Date left ED in operating hospital	
4D. Time left ED in operating hospital	
4E. Did patient go directly to theatre from ED	1 Yes, 2 No
4F. Date seen by orthopaedic team in operating hospital (if not admitted via ED)	
4G. Time seen by orthopaedic team in operating hospital (if not admitted via ED)	
4H. Did patient fall during an existing inpatient admission in operating hospital	1 Yes, 2 No
5. Type of ward admitted to in operating hospital	1 Orthopaedic Ward 2 Never Admitted to Orthopaedic Ward 9 Not Documented
5A. Date of admission to orthopaedic ward	
5B. Time of admission to orthopaedic ward	
6A. Pre-fracture Indoor Walking	0 Unable, 1 Assistance of one person 2 With an aid, 3 independent
6B. Pre-fracture Outdoor Walking	0 Unable, 1 Assistance of one person 2 With an aid, 3 independent

# APPENDIX 1: DATASET

HIPE Portal Data Entry / Hip Fracture Admission (V5.0.1) 13 Dec 2016

Question	Options
<b>6C.</b> Pre-fracture shopping mobility	0 Unable, 1 Assistance of one person 2 With an aid, 3 independent
<b>7.</b> AMT Performed	1 Yes, 2 No 3 Patient Refused, 9 Not Documented
<b>7A.</b> AMTS	00 - 10
<b>8.</b> Side of fracture	1 Left, 2 Right, 3 Both
<b>8A.</b> Type of fracture	1 Intracapsular - displaced 2 Intracapsular - undisplaced 3 Intertrochanteric 4 Subtrochanteric 5 Periprosthetic 8 Other 9 Not documented
<b>8B.</b> Type of fracture (Other, please specify)	
<b>8C.</b> Type of fracture (Right)	See Q&A
<b>8D.</b> Type of fracture (Right, Other, please specify)	
<b>9.</b> Pathological	1 Atypical, 2 Malignancy 3 No, 9 Not documented
<b>10.</b> History of previous fragility fracture(s)	1 Yes, 2 No, 9 Not documented
<b>11.</b> Pre-op medical assessment	1 Routine by geriatrician 2 Routine by medical physician 6 None 7 Ger review following request 8 Med physician review following request 9 Not documented
<b>11A.</b> Assessed by Geriatrician during this acute admission	1 Yes, 2 No, 9 Not documented
<b>11B.</b> Geriatrician Assessment Date	
<b>11C.</b> Geriatrician Assessment Time	
<b>11D.</b> Geriatrician Grade	1 Consultant 2 SpR 3 Registrar 8 Other 9 Not documented

# APPENDIX 1: DATASET

HIPE Portal Data Entry / Hip Fracture Admission (V5.0.1) 13 Dec 2016

Question	Options
<b>12. Operation</b>	00 no oper. performed 01 int fix DHS 02 int fix Screws 03 int fix IM nail long 04 int fix IM nail short 05 art uni-p hemi uncem uncoated 06 art uni-p hemi uncem coated 07 art uni-p hemi cem. 08 art bi-p hemi uncem uncoated 09 art bi-p hemi uncem coated 10 art bi-p hemi cem. 11 art THR uncem uncoated 12 art THR uncem coated 13 art THR cem. 88 other 99 not documented
<b>12A1. Type of implant (fx type = intracapsular)</b>	1 ETS 2 Bipolar Exeter 3 Corail 4 Austin Moore 5 C Stem 6 Thompsons 7 Charley Bipolar
<b>12A2. Type of implant (fx type = intertrochanter)</b>	1 Screws 2 DHS 3 Gamma nail long 4 Gamma nail short 5 Intertan
<b>12A3. Type of implant (fx type = periprosthetic)</b>	1 ORIF 2 Revision
<b>12A. ASA Grade</b>	1 Normal healthy individual 2 Mild systemic disease that does not limit activity 3 Severe systemic disease that limits activity but is not incapacitating 4 Incapacitating systemic disease which is constantly life-threatening 5 Moribund - not expected to survive 24 hours with or without surgery 9 Not documented
<b>12B. Type of Anaesthesia</b>	1 GA only 2 GA + nerve block 3 GA + spinal anaesthesia 4 GA + epidural anaesthesia 5 SA only 6 SA + nerve block 7 SA + epidural (CSE) 8 Other 9 Not documented

# APPENDIX 1: DATASET

HIPE Portal Data Entry / Hip Fracture Admission (V5.0.1) 13 Dec 2016

Question	Options
<b>12C.</b> Surgeon Grade	1 Consultant 2 Specialist Registrar 3 Registrar 4 SHO 8 Other 9 Not documented
<b>12C2.</b> Was consultant orthopaedic surgeon present in the operating room	1 Yes, 2 No 9 Not documented
<b>12D.</b> Anaesthetist Grade	1 Consultant 2 Specialist Registrar 3 Registrar 4 SHO 8 Other 9 Not documented
<b>12D2.</b> Was consultant anaesthetist present in the operating room	1 Yes, 2 No 9 Not documented
<b>12E.</b> Date of primary surgery	
<b>12F.</b> Time of primary surgery	
<b>12H.</b> Reason if delay >48 hours	0 No delay - surgery < 48 hours 1 Awaiting orthopaedic diagnosis or investigation 2 Awaiting medical review investigation or stabilisation 3 Awaiting inpatient or high dependency bed 4 Awaiting space on theatre list 5 Problem with theatre/equipment 6 Problem with theatre/surgical/anaesthetic staff cover 7 Cancelled due to list over-run 8 Other 9 Not documented
<b>12H2.</b> Other Reason if delay > 48 hours	
<b>12J.</b> Mobilised on day of, or day after surgery	1 Yes, 2 No, 9 Not documented
<b>12J2.</b> Mobilised by	1 Physiotherapist 8 Other, 9 Not documented
<b>12K.</b> Physiotherapy Assessment on day of, or day after surgery	1 Yes, 2 No, 9 Not documented
<b>12L.</b> Cumulated Ambulatory Score – day after surgery (0 - 6)	

# APPENDIX 1: DATASET

HIPE Portal Data Entry / Hip Fracture Admission (V5.0.1) 13 Dec 2016

Question	Options
<b>12M.</b> Re-operation within 30 days	0 None 1 Reduction of dislocated prosthesis 2 Washout or debridement 3 Implant removal 4 Revision of internal fixation 5 Conversion to Hemiarthroplasty 6 Conversion to THR 7 Girdlestone/excision arthroplasty 8 Surgery for periprosthetic fracture 9 Not documented
<b>13.</b> Operation (Right)	See Q12
<b>14.</b> Pressure ulcers	1 Yes, 3 No, 9 Not documented
<b>15.</b> Specialist Falls Assessment	0 No, 1 Yes - performed on this admission 2 Yes - awaits further out-patient assessment
<b>16.</b> Bone protection medication	0 No assessment 1 Started on this admission 2 Continued from pre-admission 3 Awaits DXA scan 4 Awaits out-patient assessment 5 Assessed – no bone protection medication needed/appropriate
<b>17.</b> Multidisciplinary rehabilitation team assessment	1 Yes, 3 No, 9 Not documented
<b>18.</b> Cumulated Ambulatory Score - day of acute hospital discharge (0-6)	
<b>19.</b> Where was the patient discharged to following the acute hospital spell?	1 Home 2 On-site rehab unit 3 Off-site rehab unit 4 Convalescence care 5 New adm to nursing home or long-stay care 6 Return adm to nursing home or long-stay care 8 Other
<b>19A.</b> Discharged to (Other, please specify)	
<b>20.</b> Is admission data entry complete for this episode	1 Yes, 2 No

## APPENDIX 2: IHFD FREQUENTLY ASKED QUESTIONS

Question	Answer
What does IHFD stand for?	Irish Hip Fracture Database
Who are the members of the IHFD Governance Committee?	<p><b>Dr Emer Ahern</b>, National IHFD Clinical Geriatric Lead</p> <p><b>Louise Brent</b>, National IHFD Audit Coordinator</p> <p><b>Dr Michael Carton</b>, Senior Scientist, Measurement for Improvement Team, HSE Quality Improvement Division</p> <p><b>Aisling Connolly</b>, Communications &amp; Events Lead, National Office of Clinical Audit</p> <p><b>Dr Tara Coughlan</b>, National Speciality Director for Geriatric Medicine</p> <p><b>Philip Dunne</b>, IT Systems Support, Healthcare Pricing Office</p> <p><b>Catherine Farrell</b>, Programme Manager Trauma and Orthopaedic Clinical Programme</p> <p><b>Michelle Fitzgerald MISCP</b>, Senior Physiotherapist</p> <p><b>Mr Conor Hurson</b>, National IHFD Clinical Orthopaedic Lead</p> <p><b>Mr Paddy Kenny</b>, National Clinical Lead for Trauma and Orthopaedic Clinical Programme</p> <p><b>Dr Micheal Looney</b>, Consultant Anaesthetist, Connolly Hospital</p> <p><b>Dr. Geraldine McMahon</b>, Consultant in Emergency Medicine</p>
How do I get access to the IHFD?	The lead clinician for the IHFD in your hospital should email (from his/her HSE/ Hospital email address) Philip.Dunne@hpo.ie requesting access to the database. The email should include the names and contact details of any personnel within the hospital requiring IHFD access. All subsequent requests for access must also come from the lead clinician.
What do I do if I forget my username and password?	Contact Philip.Dunne@hpo.ie or ihfd@noca.ie.
Can I view anyone else's data?	No, each hospital is registered separately and can only view their local data.
Can more than one person in a hospital be given access to the database for data entry?	Yes, as many as you wish but the request must come from the lead clinician.
How long will it take to enter data?	<p>There are two options for Data Entry.</p> <p>This will vary according to experience but usually &lt;15 minutes per patient entry.</p> <p><b>1. Pre-Discharge</b></p> <ol style="list-style-type: none"> <li>Type in the Medical Record Number e.g. 1234567</li> <li>Click on New Case</li> <li>Enter the hip fracture data</li> <li>Click on Store</li> </ol> <p>Note: Only select the option "Store as Non-Admitted Episode" if you are sure the patient was not admitted during this episode of care.</p> <p>If you choose to enter pre-discharge data, the system will automatically merge the hip fracture data and the HIPE data after the patient has been discharged.</p> <p><b>2. Post-Discharge</b></p> <ol style="list-style-type: none"> <li>Type in the Medical Record Number e.g. 1234567</li> <li>Click on the relevant Discharge Date</li> <li>Enter the hip fracture data (under "Optional" tab)</li> <li>Click on Store</li> </ol>

## APPENDIX 2: IHFD FREQUENTLY ASKED QUESTIONS

Question	Answer
Once submitted, can I retrieve records to edit content?	Yes, at any time.
What if date of Trauma is not documented?	If unknown enter 99-99-9999.
What if the patient is transferred from another hospital?	<b>First presenting hospital</b> Document the hospital the patient first presents at e.g. The patient presents at a hospital with no orthopaedic service and has to be transferred to an operating hospital. The time starts ticking from presentation at the first ED or if a transfer from within a hospital with no orthopaedic service to an operating hospital enter 'date and time seen by orthopaedic team' as most likely time when diagnosis is made. In most cases the first presenting hospital will be the same as the operating hospital. This should still be documented.
If the patient is admitted from within hospital - how do I record this?	We recognise that some patients may sustain a hip fracture whilst already in hospital or may require acute medical management (i.e. are not admitted primarily as a fractured hip). There has been a new field added to the dataset as follows: <b>Q 4H. Did patient fall during an existing inpatient admission in operating hospital 1= Yes 2 = No</b>
Admission to orthopaedic ward	Includes dedicated geriatrician-staffed hip fracture wards as well as conventional orthopaedic/trauma wards. Enter <b>Orthopaedic ward</b> if in-patient on an orthopaedic ward at any time during the acute hip fracture spell.
AMTS (Abbreviated Mental Test Score)	This 10 item version is a simple and robust screening tool in the acute patient. Full assessment for confused people (AMTS less than 7) requires more detailed tools for cognition (MMSE) or presence of delirium (CAM).
Fracture type	Basal and basi-cervical fractures are to be classed as intertrochanteric.
What fracture types are recorded in IHFD	HIPE Diagnosis Codes: S72.00 = Fracture of neck of femur, part unspecified S72.01 = Fracture of intracapsular section of femur S72.02 = Fracture of upper epiphysis (separation) of femur S72.03 = Fracture of subcapital section of femur S72.04 = Fracture of midcervical section of femur S72.05 = Fracture of base of neck of femur S72.08 = Fracture of other parts of neck of femur S72.10 = Fracture of trochanteric section of femur, unspecified S72.11 = Fracture of intertrochanteric section of femur S72.2 = Subtrochanteric fracture
Arthroplasty	Any replacement of the upper femur including unipolar, bipolar hemi-arthroplasties and total hip replacements.

## APPENDIX 2: IHFD FREQUENTLY ASKED QUESTIONS

Question	Answer
<b>What is a pathological fracture?</b>	A bone broken, caused not by trauma alone, but so weakened by disease as to break with abnormal ease. Pathological fractures are characteristic of primary and metastatic malignant disease and myeloma. Answer <b>Malignancy</b> only if primary or secondary malignancy present at the fracture site.
<b>What is an atypical fracture?</b>	Atypical fractures are transverse femoral fractures, with an unusual cortical spike medially which occur in the subtrochanteric and shaft regions (you should only enter subtrochanteric fractures to the database). They follow low trauma injuries and patients may report pre-injury pain.
<b>Normal working hours?</b>	The National Confidential Enquiry into Peri-operative Deaths (NCEPOD) reports of 1997 and 2003 define “out of hours” as any time outside 08:00 to 17:59 on weekdays, and any time on a Saturday or Sunday.
<b>When is considered time of primary surgery?</b>	The time of primary surgery is taken from the time of induction of anaesthesia. The time is shown in hours to 2 decimal place, e.g. 1.25 = 1hr 15 mins, 3.5 = 3hrs 30 mins, 2.67 = 2hrs 40 mins.
<b>When does the clock start ticking?</b>	As soon as the patient arrives in ED or is seen by the orthopaedic team. <b>Scenario 1:</b> Hip pain, initial X-ray, no fracture seen, then CT / MRI identifies fracture, time of arrival to ED to be used <b>Scenario 2:</b> SHO misses fracture, radiologist report shows fracture, time of first arrival to ED to be used <b>Scenario 3:</b> Impacted or old fracture, treated conservatively, trial of mobilisation fails, time of arrival to ED to be used <b>Scenario 4:</b> ED diagnosis? fracture, awaiting CT / MRI, time of first arrival to ED to be used.
<b>What is an ASA Score?</b>	The American Society of Anaesthesiologists (ASA) devised a preoperative risk score based on the presence of co-morbidities at the time of surgery American Society of Anesthesiologists (ASA 1963) physical status classification: 1. Healthy person. 2. Mild systemic disease. 3. Severe systemic disease. 4. Severe systemic disease that is a constant threat to life. 5. A moribund person who is not expected to survive without the operation.  This grading does not take into account acute illness, hence a patient can be ASA 1 and ‘unfit’.
<b>What is meant by ‘Routine by Medical Physician’?</b>	Review by a medical physician at Registrar level or above i.e. not an Orthopaedic Surgeon.
<b>What is meant by ‘Routine by Geriatrician’?</b>	Review by a Geriatrician at Registrar level or above.
<b>What is meant by ‘Medical review following request’?</b>	Review by a member of the medical team at Registrar level or above following a request from the orthopaedic service or emergency department.

## APPENDIX 2: IHFD FREQUENTLY ASKED QUESTIONS

Question	Answer
Issues surrounding delay to surgery	<p>Please document only the <b>main</b> reason for delay. Options are:</p> <ul style="list-style-type: none"> <li>• Medically unfit - awaiting orthopaedic diagnosis/investigation - this means waiting for MRI scan or other confirmation of diagnosis.</li> <li>• Medically unfit - awaiting medical review/investigation or stability - this means waiting for a medical review as patient remains medically unfit for surgery/anaesthetic.</li> <li>• Administrative/logistic - awaiting in-patient or high dependency bed.</li> <li>• Administrative/logistic - awaiting space on theatre list.</li> <li>• Administrative/logistic - problem with theatre /equipment.</li> <li>• Administrative/logistic - problem with theatre/surgical/anaesthetic staff cover.</li> <li>• Cancelled due to theatre over-run - this option is to be used when the patient has been allocated a theatre slot - but for some reason the list has over-run.</li> <li>• Other - any other reason than the list above.</li> <li>• No operation performed.</li> </ul>
Pressure ulcers	<p>Did patient acquire a new pressure ulcer (Grade 2 or above) during the acute admission?</p> <ul style="list-style-type: none"> <li>• This should be answered as 'yes' <b>only</b> if the patient has developed a grade 2 pressure ulcer or above during their acute orthopaedic admission.</li> <li>• Ignore ulcers acquired during an acute stay but more than 120 days after admission.</li> <li>• If nothing is documented and the patient has left the hospital '<b>not documented</b>' must be recorded.</li> </ul>
Definition of a Ward Round	<p>The ward round is a parade through the hospital, of professionals where most decision making concerning patient care is made. The round provides an opportunity for the multidisciplinary team to listen to the patient's narrative and jointly interpret his concerns. From this unfolds diagnosis, management plans, prognosis formation and the opportunity to explore social, psychological, rehabilitation and placement issues. Physical examination of the patient at the bedside still remains important (O'Hare, 2008).</p>
Specialist falls assessment	<p>A systematic assessment by a suitably trained person e.g. Geriatrician or a specialist assessment trained nurse which must cover the following domains:</p> <p>Falls history (noting previous falls)</p> <p>cause of index fall (including medication review)</p> <p>risk factors for falling and injury (including fracture)</p> <p>medication review</p> <p>and from this information formulate and document a plan of action to prevent further falls.</p>

## APPENDIX 2: IHFD FREQUENTLY ASKED QUESTIONS

Question	Answer
<b>Definition of Multidisciplinary Rehabilitation Assessment Team</b>	A group of people of different professions (and including as a minimum a physiotherapist, occupational therapist, nurse and doctor) with job plan responsibilities for the assessment and treatment of hip fracture patients, and who convene (including face to face or virtual ward round) regularly (and at least weekly) to discuss patient treatment and care and plan shared clinical care goals.
<b>What drugs constitute bone protection therapy?</b>	<p>NOT just calcium and vitamin D</p> <ol style="list-style-type: none"> <li><b>Bisphosphonates</b> (oral, combined with Calcium/ Vitamin D, intravenously) <ul style="list-style-type: none"> <li>Etidronate</li> <li>Alendronate</li> <li>Risedronate</li> <li>Ibandronate</li> <li>Zoledronate</li> <li>Pamidronate</li> </ul> </li> <li><b>Denosumab</b></li> <li><b>HRT and SERMS</b> <ul style="list-style-type: none"> <li>HRT (various)</li> <li>Tibolone</li> <li>Raloxifene</li> </ul> </li> <li><b>Parathyroid hormone</b> <ul style="list-style-type: none"> <li>PTH 1-34</li> <li>PTH 1-84</li> </ul> </li> <li><b>Strontium</b> <ul style="list-style-type: none"> <li>Strontium ranelate</li> </ul> </li> <li><b>Calcium and vitamin D</b> <ul style="list-style-type: none"> <li>Calcitriol</li> <li>Calcium and vitamin D – various</li> <li>Alpha-calcidol (or one alpha)</li> </ul> </li> <li><b>Calcitonin</b></li> <li><b>Vitamin D's</b></li> </ol>
<b>Minimum age?</b>	We collect the data on all patients over the age of 30 but <b>only report on those 60 and above.</b>

## APPENDIX 3: © ABBREVIATED MENTAL TEST SCORE

<b>PATIENT'S DETAILS:</b>		
<b>DATE OF TEST:</b>		
<b>Scoring</b> Each correctly answered question scores 1 point.		
<b>Interpretation</b> Scores < 7 is indicative of likely cognitive impairment.		
INSTRUMENT		
1. What is your age?	0	1
2. What is the time (to nearest hour)?	0	1
3. Address (for recall at end of test) Say to patient: I am going to say an address: '42 West Street'. Can you say that address please? I am going to ask you to repeat it for me in a few minutes.	0	1
4. What is the year?	0	1
5. What is your home address ?	0	1
6. Recognition of two persons (Doctor, Nurse)	0	1
7. What is your date of birth?	0	1
8. In what year did First/Second World War begin? (Other dates can be used with a preference for dates in the past)	0	1
9. What is the name of the current Taoiseach?	0	1
10. Count backwards 20-1	0	1
<b>TOTAL SCORE</b>		

© Hodkinson, H. (1972). Evaluation of a mental test score for assessment of mental impairment in the elderly. Age and Ageing, 1(4), pp.233-238.

# APPENDIX 4: PRESSURE ULCER CLASSIFICATION

## International NPUAP-EPUAP Pressure Ulcer Classification

### **CATEGORY/STAGE I: NON-BLANCHABLE REDNESS OF INTACT SKIN**

Intact skin with non-blanchable erythema of a localized area usually over a bony prominence. Discoloration of the skin, warmth, edema, hardness or pain may also be present. Darkly pigmented skin may not have visible blanching. Further description: The area may be painful, firm, soft, warmer or cooler as compared to adjacent tissue. Category/Stage I may be difficult to detect in individuals with dark skin tones. May indicate “at risk” persons.

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### **CATEGORY/STAGE II: PARTIAL THICKNESS SKIN LOSS OR BLISTER**

Partial thickness loss of dermis presenting as a shallow open ulcer with a red pink wound bed, without slough. May also present as an intact or open/ruptured serum filled or sero-sanguinous filled blister. Further description: Presents as a shiny or dry shallow ulcer without slough or bruising. This category/stage should not be used to describe skin tears, tape burns, incontinence associated dermatitis, maceration or excoriation.

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### **CATEGORY/STAGE III: FULL THICKNESS SKIN LOSS (FAT VISIBLE)**

Full thickness tissue loss. Subcutaneous fat may be visible but bone, tendon or muscle are not exposed. Some slough may be present. May include undermining and tunnelling. Further description: The depth of a Category/Stage III pressure ulcer varies by anatomical location. The bridge of the nose, ear, occiput and malleolus do not have (adipose) subcutaneous tissue and Category/Stage III ulcers can be shallow. In contrast, areas of significant adiposity can develop extremely deep Category/Stage III pressure ulcers. Bone/tendon is not visible or directly palpable.

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### **CATEGORY/STAGE IV: FULL THICKNESS TISSUE LOSS (MUSCLE/BONE VISIBLE)**

Full thickness tissue loss with exposed bone, tendon or muscle. Slough or eschar may be present. Often include undermining and tunnelling. Further description: The depth of a Category/Stage IV pressure ulcer varies by anatomical location. The bridge of the nose, ear, occiput and malleolus do not have (adipose) subcutaneous tissue and these ulcers can be shallow. Category/Stage IV ulcers can extend into muscle and/or supporting structures (e.g., fascia, tendon or joint capsule) making osteomyelitis or osteitis likely to occur. Exposed bone/muscle is visible or directly palpable.

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## APPENDIX 5: FREQUENCY TABLES

See Appendix 1: Dataset V5 for Question (Q) references

<b>Figure 3</b>	<b>Gender</b>	<i>N</i>	%
	Male	966	30.58
	Female	2,193	69.42
	Total	3,159	100.0

<b>Figure 4</b>	<b>Age Group: Male</b> (HIPE variable)	<i>N</i>	%
	60-69	165	17.08
	70-79	299	30.95
	80-89	392	40.58
	90-109	110	11.39
	Total	966	100.0
	<b>Age Group: Female</b> (HIPE variable)	<i>N</i>	%
	60-69	260	11.86
	70-79	604	27.54
	80-89	949	43.27
	90-109	380	17.33
	Total	2,193	100.0

<b>Figure 5</b>	<b>Source of Admission</b> (HIPE variable)	<i>N</i>	%
	Home	2,557	80.94
	Nursing Home, Convalescent Home or Other Long-Stay Accommodation	282	8.93
	Transfer from HIPE/Acute Hospital <sup>(5a)</sup> , <sup>(5b)</sup>	293	9.28
	All Other Sources <sup>(5c)</sup>	27	0.85
	Total	3,159	100.00

<sup>(5a)</sup> HIPE transfers relate to inpatients only.

<sup>(5b)</sup> Includes transfers from hospital in HIPE Hospital Listing or transfer from any acute hospital not in HIPE Hospital listing.

<sup>(5c)</sup> Includes 'Transfer from 'Non-Acute Hospital not in HIPE Hospital listing' and 'Transfer from Hospice not in HIPE Hospital listing' which are not itemised separately for patient confidentiality reasons. 'Transfer from Psychiatric Hospital/Unit' and 'Temporary place of Residence' category had 7 and 15 cases recorded respectively.

<b>Figure 6</b>	<b>Presentation of Hip Fracture by time of day</b>	<i>N</i>	%
	Hour		
	00:00	90	2.85
	01:00	87	2.75
	02:00	71	2.25
	03:00	51	1.61
	04:00	46	1.46
	05:00	50	1.58
	06:00	29	0.92
	07:00	46	1.46
	08:00	44	1.39
	09:00	116	3.67
	10:00	150	4.75
	11:00	203	6.43
	12:00	221	7.00
	13:00	216	6.84
	14:00	180	5.70
	15:00	218	6.90
	16:00	198	6.2

## APPENDIX 5: FREQUENCY TABLES

See Appendix 1: Dataset V5 for Question (Q) references

**Figure 6 Presentation of Hip Fracture by time of day (continued)**

17:00	219	6.93
18:00	176	5.57
19:00	179	5.67
20:00	151	4.78
21:00	163	5.16
22:00	139	4.40
23:00	114	3.61
Missing Value	2	0.06
Total	3,159	100.00

**Figure 7 AMT Performed (Q7)**

	<i>N</i>	%
Yes	396	12.54
No	2,351	74.42
Patient Refused	11	0.35
Not Documented	57	1.80
Missing Value (blank)	344	10.89
Total	3,159	100.00
<b>AMT Scores (Q7A)</b>	<i>N</i>	%
0 - 6	125	31.57
7 - 10	271	68.43
Total	396	100.00

**Figure 8 ASA Grade Completeness (Q12A) <sup>(8a)</sup>**

	<i>N</i>	%
Grade Known <sup>(8b)</sup>	2,768	91.38
Grade Not Documented	197	6.50
Missing Value	64	2.11
Total	3,029	100.00
<b>ASA Grade (Q12A) <sup>(8b)</sup></b>	<i>N</i>	%
Grade 1	60	2.17
Grade 2	1,072	38.73
Grade 3	1,456	52.60
Grade 4-5	180	6.50
Total	2,768	100.00

<sup>(8a)</sup> Relates to cases with values 1 - 88 recorded for Q12A.

<sup>(8b)</sup> Relates to cases with grades of 1-5 recorded.

**Figure 9 Pre-Fracture Score (Q6D)**

	<i>N</i>	%
0	37	1.55
1	84	3.52
2	206	6.52
3	174	7.30
4	290	12.17
5	169	7.09
6	270	11.33
7	124	5.20
8	20	0.84
9	1002	42.05
Total	2383	100.00

## APPENDIX 5: FREQUENCY TABLES

See Appendix 1: Dataset V5 for Question (Q) references

<b>Figure 9A</b>	<b>Pre-Fracture Mobility Indoor (Q6A)</b>	<i>N</i>	<i>%</i>
	Unable	50	1.58
	Assistance of one person	279	8.83
	With an aid	968	30.64
	Independent	1,518	48.05
	Missing Value	344	10.89
	Total	3,159	100.00
	<b>Pre-Fracture Mobility Outdoor (Q6B)</b>	<i>N</i>	<i>%</i>
	Unable	250	7.91
	Assistance of one person	347	10.98
	With an aid	720	22.79
	Independent	1,132	35.83
	Missing Value	710	22.48
	Total	3,159	100.00
	<b>Pre-Fracture Mobility Shopping (Q6C)</b>	<i>N</i>	<i>%</i>
	Unable	776	24.56
	Assistance of one person	311	9.84
	With an aid	286	9.05
	Independent	1,010	31.97
	Missing Value	776	24.56
	Total	3,159	100.00
<b>Figure 10</b>	<b>Fracture Type</b>	<i>N</i>	<i>%</i>
	Intracapsular - displaced	1,360	43.05
	Intracapsular - undisplaced	270	8.55
	Intertrochanteric	1,126	35.64
	Subtrochanteric	233	7.38
	Periprosthetic	54	1.71
	Other	30	0.95
	Not Documented	66	2.09
	Missing Value	20	0.63
	Total	3,159	100.00
<b>Figure 12</b>	<b>Mode of Admission (Composite Variable) <sup>(12a)</sup></b>	<i>N</i>	<i>%</i>
	Via ED	2,838	89.83
	- Via ED direct	2,751	87.08
	- Via ED indirectly (i.e via first presenting hospital) or Not Known if direct or not <sup>(12b)</sup>	87	2.75
	Seen by Orthopaedic Team	321	10.16
	Total	3,159	100.00
	<sup>(12a)</sup> Derived from Q3-Q4B, see Appendix 6: Specifications for Composite Variables.		
	<sup>(12b)</sup> Includes 'Not Known' category which is not itemised separately for patient confidentiality reasons.		

## APPENDIX 5: FREQUENCY TABLES

See Appendix 1: Dataset V5 for Question (Q) references

<b>Figure 13</b>	<b>Admission to Orthopaedic Ward</b> (Composite Variable) <sup>(13)</sup>	<i>N</i>	%
	Admitted to Orthopaedic ward	2,847	90.12
	Yes-within 4 hours	437	13.83
	Yes-After 4 hours	2,374	75.15
	Yes-Time interval not known	36	1.14
	Never admitted to Orthopaedic ward	305	9.66
	Not known	7	0.22
	Total	3,159	100.00

<sup>(13)</sup> Derived from Q3-Q4B, Q4F-Q4H and Q5-Q5B, see Appendix 6: Specifications for Composite Variables.

<b>Figure 13A</b>	<b>Admission to Orthopaedic Ward by Hospital</b> <sup>(13a)(13b)</sup>	<i>n</i>	<i>N</i>	%
	<i>Hospital</i>			
	Beaumont	32	183	17.5
	Connolly	24	151	15.9
	Cork	5	240	2.1
	Drogheda	28	266	10.5
	Galway	10	208	4.8
	Kerry	14	126	11.1
	Letterkenny	63	129	48.8
	Limerick	119	300	39.7
	Sligo	40	125	32.0
	St. James's	13	159	8.2
	St. Vincent's	15	290	5.2
	Tallaght	5	176	2.8
	Tullamore	19	221	8.6
	Waterford	38	388	9.8
	Total	426	3100	13.7

<sup>(13a)</sup> Mayo University Hospital and 'Not Known' excluded.

<sup>(13b)</sup> Mater Misericordiae University is not itemized separately for patient confidentiality reasons, but is included in the Total amount.

<b>Figure 14</b>	<b>Surgery Performed</b> (Q12)	<i>N</i>	%
	Yes <sup>(14)</sup>	3,029	95.88
	No	126	3.99
	Missing Value	4	0.13
	Total	3,159	100.00

<sup>(14)</sup> Relates to cases with values 1 - 88 recorded.

<b>Figure 15</b>	<b>Time to Surgery - 48 Hours / Working Hours</b> (Composite Variable) <sup>(15)</sup>	<i>N</i>	%
	Within 48 hours-within working hours (Mon-Sun 08:00-17:59)	2,190	72.30
	Within 48 hours-outside of working hours (Mon-Sun 18:00-07:59)	72	2.38
	After 48 Hours	756	24.96
	Not Known	11	0.36
	Total	3,029	100.00

<sup>(15)</sup> Derived from Q3-Q4B, Q4F-Q4H, Q5-Q5B, Q12 and Q12E-Q12F, see Appendix 6: Specifications for Composite Variables.

## APPENDIX 5: FREQUENCY TABLES

See Appendix 1: Dataset V5 for Question (Q) references

**Figure 15A** Time to Surgery-48 hours/ Working Hours by Hospital <sup>(15a)</sup>

Hospital	<i>n</i>	<i>N</i>	%
Beaumont	120	171	70.2
Connolly	146	135	92.5
Cork	132	238	55.5
Drogheda	156	245	63.7
Galway	177	217	81.6
Kerry	85	118	72.0
Letterkenny	88	124	71.0
Limerick	185	283	65.4
Mater	94	139	67.6
Sligo	96	125	76.8
St. James's	108	158	68.4
St. Vincent's	246	279	88.2
Tallaght	143	172	83.1
Tullamore	150	208	72.1
Waterford	261	380	68.7
Total	2176	3003	72.5

<sup>(15a)</sup> Mayo University Hospital, those who did not have surgery and 'Not Known' excluded.

**Figure 16** Reason for Delay Beyond 48 Hours (Q12H) <sup>(16a)</sup>

	<i>N</i>	%
Awaiting orthopaedic diagnosis or investigation	29	3.27
Awaiting medical review investigation or Stabilisation	418	47.18
Awaiting space on theatre lists	86	9.71
Problem with theatre/surgical/anaesthetic staff cover	22	2.48
Cancelled due to list over-run	82	9.26
Other	26	2.93
Not Documented	41	4.62
Missing Value (blank) <sup>(16b)</sup>	182	20.54
Total	886	100.0

<sup>(16a)</sup> Relates to Figure 14's 'After 48 Hours' cases.

<sup>(16b)</sup> Includes invalid 'No delay - surgery <48 hours' cases.

**Figure 18** Assessment by Geriatrician (Composite Variable) <sup>(18)</sup>

	<i>N</i>	%
Yes	1,806	57.17
Yes-Pre-Operative	372	11.78
Yes-at any other time during admission	1,424	45.08
Yes-Not known	10	0.32
No assessment	1,284	40.65
Not known	69	2.18
Total	3,159	100.00

<sup>(18)</sup> Derived from Q11 and Q11A, see Appendix 6: Specifications for Composite Variables.

## APPENDIX 5: FREQUENCY TABLES

See Appendix 1: Dataset V5 for Question (Q) references

**Figure 18A** **Assessment by Geriatrician by Hospital** <sup>(18a)</sup>

<i>Hospital</i>	<i>n</i>	<i>N</i>	<i>%</i>
Beaumont	161	182	88.5
Connolly	57	151	37.7
Cork	213	239	89.1
Drogheda	25	266	9.4
Galway	106	234	45.3
Kerry	75	126	59.5
Letterkenny	28	129	21.7
Limerick	241	300	80.3
Mater	102	139	73.4
Sligo	70	125	56.0
St. James's	107	162	66.0
St. Vincent's	266	294	90.5
Tallaght	68	176	38.6
Tullamore	184	221	83.3
Waterford	92	389	23.7

<sup>(18a)</sup> Mayo University Hospital and 'Not Known' excluded.

**Figure 19** **Type of Anaesthesia** (Q12B) <sup>(19)</sup>

	<i>N</i>	<i>%</i>
GA only	346	11.42
GA & Nerve Block	227	7.49
GA & SA	81	2.67
GA & Epidural	6	0.20
SA Only	1,759	58.07
SA & Nerve Block	499	16.47
SA & Epidural	11	0.36
Other	1	0.03
Not Documented	5	0.17
Missing Value (blank)	94	3.10
Total	3,029	100.00

<sup>(19)</sup> Relates to cases with values 1 - 88 recorded for Q12.

**Figure 20** **Type of Surgery** (Q12) <sup>(20)</sup>

	<i>N</i>	<i>%</i>
Internal Fixation DHS	754	24.89
Internal Fixation Screws	62	2.05
Internal Fixation IM Nail Long	340	11.22
Internal Fixation IM Nail Short	313	10.33
Arthroplasty Hemi Uncemented	405	13.37
Arthroplasty Hemi Cemented	983	32.45
Arthroplasty THR Uncemented	39	1.29
Arthroplasty THR Cemented	72	2.38
Other	61	2.01
Total	3,029	100.00

<sup>(20)</sup> Relates to cases with values 1 - 88 recorded. Categories have been condensed, in that coated and uncoated categories have been combined, as have uni-polar and bi-polar categories i.e values 5, 6, 8 and 9 have been combined and labelled as 'Arthroplasty Hemi Uncemented'; values 7 & 10 have been combined and labelled as 'Arthroplasty Hemi Cemented'; and values 11 & 12 have been combined and labelled as 'Arthroplasty THR Uncemented'.

## APPENDIX 5: FREQUENCY TABLES

See Appendix 1: Dataset V5 for Question (Q) references

<b>Figure 21</b>	<b>Type of Surgery for Undisplaced Intracapsular Fractures</b> <sup>(20)(21a)</sup>	<i>N</i>	%
	Internal Fixation DHS	76	32.62
	Internal Fixation Screws	30	12.88
	Arthroplasty Hemi Uncemented	26	11.16
	Arthroplasty Hemi Cemented	89	38.20
	Arthroplasty THR Cemented	5	2.15
	Other <sup>(21b)</sup>	7	3.00
	Total	233	100.00

<sup>(21a)</sup> Relates to surgery for undisplaced intracapsular fractures only (Q8A=2).

<sup>(21b)</sup> 'Internal Fixation IM Nail Short', 'Internal Fixation IM Nail Long' and 'Arthroplasty THR Uncemented' have been combined as they cannot be itemised separately for patient confidentiality reasons.

<b>Figure 22</b>	<b>Type of Surgery for Displaced Intracapsular Fractures</b> <sup>(20)(22a)</sup>	<i>N</i>	%
	Internal Fixation DHS	56	4.17
	Internal Fixation Screws	10	0.74
	Internal Fixation IM Nail Long & Internal Fixation IM Nail Short <sup>(22b)</sup>	18	1.34
	Arthroplasty Hemi Uncemented	364	27.08
	Arthroplasty Hemi Cemented	809	60.19
	Arthroplasty THR Uncemented	33	2.46
	Arthroplasty THR Cemented	54	4.02
	Total	1,344	100.00

<sup>(22a)</sup> Relates to surgery for displaced intracapsular fractures only (Q8A=1).

<sup>(22b)</sup> Includes 'Other' category which is not itemised separately for patient confidentiality reasons.

<b>Figure 23</b>	<b>Type of Surgery for Intertrochanteric Fractures</b> <sup>(20), (23a)</sup>	<i>N</i>	%
	Internal Fixation DHS	597	54.42
	Internal Fixation Screws	14	1.28
	Internal Fixation IM Nail Long	158	14.40
	Internal Fixation IM Nail Short	274	24.98
	Arthroplasty Hemi Uncemented	6	0.55
	Arthroplasty Hemi Cemented	31	2.83
	Other <sup>(23b)</sup>	17	1.55
	Total	1,097	100.00

<sup>(23a)</sup> Relates to surgery for intertrochanteric fractures only (Q8A=3).

<sup>(23b)</sup> Includes 'Arthroplasty THR Cemented' category which is not itemised separately for patient confidentiality reasons.

<b>Figure 24</b>	<b>Type of Surgery for Subtrochanteric Fractures</b> <sup>(20), (24a)</sup>	<i>N</i>	%
	Internal Fixation DHS	18	7.96
	Internal Fixation IM Nail Long	161	71.24
	Internal Fixation IM Nail Short	29	12.83
	Other <sup>(24b)</sup>	18	7.96
	Total	226	100.00

<sup>(24a)</sup> Relates to surgery for subtrochanteric fractures only (Q8A=4).

<sup>(24b)</sup> Includes 'Internal Fixation Screws', 'Arthroplasty Hemi Cemented' and 'Arthroplasty THR Cemented' categories which cannot be itemised separately for patient confidentiality reasons..

## APPENDIX 5: FREQUENCY TABLES

See Appendix 1: Dataset V5 for Question (Q) references

<b>Figure 25</b>	<b>Cementing of Arthroplasties</b> <sup>(20), (25)</sup>	<i>N</i>	<i>%</i>
	Cemented	1055	70.38
	Uncemented	444	29.62
	Total	1499	100.0
	<sup>(25)</sup> Hemi and THR arthroplasties have been combined for both cemented and uncemented types.		
<b>Figure 26</b>	<b>Mobilisation on Day of or Day After Surgery, and Mobilised by</b> (Composite Variable) <sup>(26)</sup>	<i>N</i>	<i>%</i>
	Yes	2,325	76.76
	Yes-by physiotherapist	2,158	71.24
	Yes-by other	162	5.35
	Yes-by whom not known	5	0.17
	Not mobilised	624	20.60
	Not known	80	2.64
	Total	3,029	100.00
	<sup>(26)</sup> Derived from Q12J and Q12J2, see Appendix 6: Specifications for Composite Variables.		
<b>Figure 27</b>	<b>Cumulated Ambulatory Score – Day after surgery</b> (Q12L)	<i>N</i>	<i>%</i>
	0	163	5.38
	1	122	4.03
	2	189	6.24
	3	647	21.36
	4	71	2.34
	5	18	0.59
	6	19	0.63
	Missing Value	1,800	59.43
	Total	3,029	100.00
	<b>Cumulated Ambulatory Score Day of Acute Hospital Discharge</b> (Q18)	<i>N</i>	<i>%</i>
	0	52	1.72
	1	26	0.86
	2	66	2.18
	3	244	8.06
	4	98	3.24
	5	94	3.10
	6	127	4.19
	Missing Value	2,322	76.66
	Total	3,029	100.00
<b>Figure 28</b>	<b>Pressure Ulcers</b> (Q14) <sup>(28)</sup>	<i>N</i>	<i>%</i>
	Yes	135	4.51
	No	2,763	92.35
	Not documented	15	0.50
	Missing Value (blank)	79	2.64
	Total	2,992	100.00
	<sup>(28)</sup> Excludes patients who died in hospital.		

## APPENDIX 5: FREQUENCY TABLES

See Appendix 1: Dataset V5 for Question (Q) references

**Figure 28a Pressure Ulcer incidence by Hospital** <sup>(28a)(28b)</sup>

<i>Hospital</i>	<i>n</i>	<i>N</i>	<i>%</i>
Beaumont	13	173	7.5
Connolly	5	144	3.5
Cork	8	206	3.9
Drogheda	6	257	2.3
Galway	6	215	2.8
Limerick	9	277	3.2
Mater	5	95	5.3
Sligo	6	115	5.2
St. James's	13	151	8.6
St. Vincent's	6	271	2.2
Tallaght	11	161	6.8
Tullamore	10	207	4.8
Waterford	32	366	8.7
Total	134	2882	4.6

<sup>(28a)</sup> Mayo University Hospital, those who died and 'Not Known' excluded.

<sup>(28b)</sup> University Hospital Kerry and Letterkenny University Hospital are not itemised separately for patient confidentiality reasons, but are included in the Total amount.

**Figure 29 Bone Protection Assessment/Medication (Q16)** <sup>(29)</sup>

	<i>N</i>	<i>%</i>
No Assessment or Action Taken	602	20.12
Started on this Admission	1,277	42.68
Continued from Pre-Admission	406	13.57
Awaits DXA Scan	145	4.85
Awaits Outpatient Assessment	278	9.29
Assessed - No Bone Protection Medication Needed / Appropriate	186	6.22
Missing Value (blank)	98	3.28
Total	2,992	100.00

<sup>(29)</sup> Excludes patients who died in hospital.

**Figure 29a Bone Protection Assessment / Medication by Hospital** <sup>(29a)</sup>

<i>Hospital</i>	<i>n</i>	<i>N</i>	<i>%</i>
Beaumont	150	177	84.7
Connolly	62	144	43.1
Cork	65	233	27.9
Drogheda	148	257	57.6
Galway	178	219	81.3
Kerry	50	120	41.7
Letterkenny	27	124	21.8
Limerick	230	280	82.1
Mater	77	136	56.6
Sligo	65	119	54.6
St. James's	132	158	83.5
St. Vincent's	213	273	78.0
Tallaght	63	161	39.1
Tullamore	157	207	75.8
Waterford	63	368	17.1
Total	1680	2976	56.5

<sup>(29a)</sup> Mayo University Hospital, those who died and 'Not Known' excluded.

## APPENDIX 5: FREQUENCY TABLES

See Appendix 1: Dataset V5 for Question (Q) references

<b>Figure 30</b>	<b>Specialist Falls Assessment (Q15)</b> <sup>(30)</sup>	<i>N</i>	<i>%</i>
	No	1,297	43.35
	Yes - Performed on This Admission	1,604	53.61
	Yes - Awaits Further Outpatient Assessment	15	0.50
	Missing Value (blank)	76	2.54
	Total	2,992	100.00

<sup>(30)</sup> Excludes patients who died in hospital.

<b>Figure 30a</b>	<b>Specialist Falls Assessment by Hospital</b> <sup>(30a)(30b)</sup>	<i>n</i>	<i>N</i>	<i>%</i>
	<i>Hospital</i>			
	Beaumont	167	177	94.4
	Connolly	11	144	7.6
	Cork	209	233	89.7
	Drogheda	20	257	7.8
	Kerry	70	120	58.3
	Letterkenny	105	124	84.7
	Limerick	245	280	87.5
	Mater	85	136	62.5
	Sligo	66	119	55.5
	St. James's	111	158	70.3
	St. Vincent's	266	273	97.4
	Tullamore	168	207	81.2
	Waterford	79	368	21.5
	Total	1606	2976	54.0

<sup>(30a)</sup> Mayo University Hospital, those who died and 'Not Known' excluded.

<sup>(30b)</sup> University Hospital Galway and Tallaght Hospital are not itemised separately for patient confidentiality reasons, but are included in the Total amount..

<b>Figure 31</b>	<b>Discharge Destination (HIPE variable)</b>	<i>N</i>	<i>%</i>
	Home	668	21.15
	On-site rehab unit	95	3.01
	Off-site rehab unit	948	30.01
	Convalescence care	377	11.93
	New admission to nursing home or long-stay care	200	6.33
	Return admission to nursing home or long-stay care	439	13.90
	Died	167	5.29
	Other	173	5.48
	Missing Value	92	2.91
	Total	3,159	100.00

<b>Figure 32</b>	<b>Length of Stay (HIPE variable)</b>	<i>N</i>	<i>%</i>
	Acute Stay (<=30 days)	2,656	84.08
	Extended Stays (>30 days)	503	15.92
	Total	3,159	100.00
	<b>Length of Stay (HIPE variable)</b>	Mean LOS	Median LOS
	Acute Stay (<=30 days)	12.13	11
	Extended Stay (>30 days)	61.67	49
	Total	20.02	12

# APPENDIX 5: FREQUENCY TABLES

See Appendix 1: Dataset V5 for Question (Q) references

<b>Figure 33</b>	<b>Re-operation within 30 days (Q12M)</b> <sup>(33a)</sup>	<i>N</i>	<i>%</i>
	No	2,883	95.18
	Yes <sup>(33b)</sup>	38	1.25
	Not Documented	4	0.13
	Missing Value (blank)	104	3.43
	Total	3,029	100.00
	<sup>(33a)</sup> Relates to cases with values 1 - 88 recorded for Q12.		
	<sup>(33b)</sup> Relates to cases with values 1 - 8 recorded for Q12M.		

# APPENDIX 6: SPECIFICATIONS FOR COMPOSITE VARIABLES

As illustrated in Figures 12, 13, 15, 18 and 26. See Appendix 1: Dataset V5 for Question (Q) references.

**FIGURE 12: MODE OF ADMISSION TO OPERATING HOSPITAL**

**Composite variable based on Q3-Q4B as follows:**

Category	Specification
Via ED*	If Q4=1
- via ED direct	If Q4=1; and Q4A-Q4B are recorded & Q3-Q3A >= Q4A-Q4B
- via ED indirectly i.e. via first presenting hospital	If Q4=1; and Q3-Q3A are recorded & Q3-Q3A < Q4A-Q4B
- via ED but not known if direct or not	If Q4=1; and Q3-Q3A & Q4A-Q4B are not recorded
Seen by Orthopaedic Team	If Q4=2

\* **Assumption:** When date & time of arrival at first presenting hospital (Q3-Q3A) were recorded and date & time of arrival in ED of operating hospital (Q4A-Q4B) were not, it is assumed that the first presenting hospital was the operating hospital i.e. such cases are interpreted as direct presentations with Q4A-Q4B=Q3-Q3A.

**FIGURE 13: ADMISSION TO ORTHOPAEDIC WARD**

**13.1. Composite variable based on Q3-Q4B, Q4F-Q4H, Q5-Q5B as follows:**

Category	Specification
Admitted to Orthopaedic Ward	If Q5=1
- admitted within 4 hours	If Q5=1; and time interval is calculated as within 4 hours
- admitted after 4 hours	If Q5=1; and time interval is calculated as more than 4 hours
- time interval not known	If Q5=1; and time interval is not known
Never Admitted to Orthopaedic Ward	If Q5=2
Not Known	If Q5=9 or blank

**13.2. Time Interval Determination for Patients Admitted to Orthopaedic Ward (Q5=1):**

- If admitted via ED (Q4=1) then the time interval is calculated from date & time of arrival at first presenting hospital (Q3-Q3A) or from date and time of arrival at ED of operating hospital (Q4A-Q4B), whichever is earlier, to the date & time admitted to orthopaedic ward (Q5A-Q5B).
- If not admitted via ED (Q4=2) then (i) for inpatient fall cases (Q4H=1) the time interval is calculated from the date and time seen by orthopaedic team in operating hospital (Q4F-Q4G) to the date & time admitted to orthopaedic ward (Q5A-Q5B); (ii) for other cases the time interval is calculated from the date/time of arrival at either the first presenting hospital (Q3-Q3A) or from the date/time seen by orthopaedic team (Q4F-Q4G), whichever is earlier, to the date and time admitted to orthopaedic ward (Q5A-Q5B); and If date/time of arrival at the first presenting hospital (Q3-Q3A) is not recorded, and date/time seen by orthopaedic team (Q4F-Q4G) postdates date and time admitted to orthopaedic ward (Q5A-Q5B) then the time interval is set at zero minutes.

**13.3. Determination of Time Interval Categories**

Category	Specification
within 4 hours	If interval range is 0 - 240 minutes
after 4 hours	If interval range is 241- 525,600 minutes
not known	If relevant dates/times are missing; or interval is invalid i.e. <0 minutes; or interval is implausible i.e. >525,600 minutes (1 year)

**13.4. Blue Book Standard 1,** Table 2, excludes both the 'time interval not known' and the 'Not Known' categories.

## APPENDIX 6: SPECIFICATIONS FOR COMPOSITE VARIABLES

As illustrated in Figures 12, 13, 15, 18 and 26. See Appendix 1: Dataset V5 for Question (Q) references.

**FIGURE 15: TIME TO SURGERY – 48 HOURS/WORKING HOURS**

### 15.1. Composite variable based on Q3-Q4B, Q4F-Q4G, Q5-Q5B, Q12 and Q12E-Q12F as follows:

Category	Specification
Within 48 Hours and Working Hours Mon-Sun 08:00-17:59	If Q12=1 - 88; and time interval is calculated as within 48 hours; and time of surgery is within specified working hours
Within 48 Hours but Out-of-Hours (Mon-Sun 18:00-07:59)	If Q12=1 - 88; and time interval is calculated as within 48 hours; and time of surgery is within specified working hours
After 48 Hours	If Q12=1 - 88; and time interval is calculated as more than 48 hours
Not Known	If Q12=1 - 88 and time interval is not known
Total	If Q12=1 - 88

### 15.2. Time Interval Determination for Patients who had Surgery (Q12=1 - 88):

- (a) If admitted via ED (Q4=1) then the time interval is calculated from date & time of arrival at first presenting hospital (Q3-Q3A) or from date and time of arrival at ED of operating hospital (Q4A-Q4B), whichever is earlier, to the date & time of surgery (Q12E-Q12F). If Q3-Q3A and Q4A-Q4B are missing and the patient was admitted to an orthopaedic ward (Q5=1) then the time interval is estimated by using the date & time admitted to orthopaedic ward (Q5A-Q5B) as its starting point.
- (b) If not admitted via ED (Q4=2) then (i) for inpatient fall cases (Q4H=1) the time interval is calculated from the date and time seen by orthopaedic team in operating hospital (Q4F-Q4G) to the date & time of surgery (Q12E-Q12F); (ii) for other cases the time interval is calculated from the date/time of arrival at either the first presenting hospital (Q3-Q3A) or from the date/time seen by orthopaedic team (Q4F-Q4G), whichever is earlier, to the date and time of surgery (Q12E-Q12F); (iii) if date/time of arrival at the first presenting hospital (Q3-Q3A) is not recorded, and date/time seen by orthopaedic team (Q4F-Q4G) postdates date and time admitted to orthopaedic ward (Q5A-Q5B) then the time interval is calculated from the date/time of admission to orthopaedic ward to the date and time of surgery (Q12E-Q12F); and (iv) if Q3-Q3A and Q4A-Q4B are missing and the patient was admitted to an orthopaedic ward (Q5=1) then the time interval is estimated by using the date & time admitted to orthopaedic ward (Q5A-Q5B) as its starting point.

### 15.3. Determination of Time Interval and Working Hours Categories:

Category	Specification
Within 48 Hours and Working Hours Mon-Sun 08:00-17:59	If interval range is 0 - 2880 minutes; and time of surgery (Q12F) range is 08:00 - 17:59
Within 48 Hours but Out-of-Hours (Mon-Sun 18:00-07:59)	If interval range is 0 - 2880 minutes; and time of surgery (Q12F) range is 18:00 - 07:59
After 48 Hours	If interval range is 2881 - 525,600 minutes
Not Known	If relevant dates/times are missing; or interval is invalid i.e. <0 minutes; or interval is implausible i.e. >525,600 minutes (1 year)

### 15.4. Blue Book Standard 2, Table 2, excludes the 'Not Known' category.

## APPENDIX 6: SPECIFICATIONS FOR COMPOSITE VARIABLES

As illustrated in Figures 12, 13, 15, 18 and 26. See Appendix 1: Dataset V5 for Question (Q) references.

**FIGURE 18: ASSESSMENT BY GERIATRICIAN, AND WHEN ASSESSED**

**Composite variable based on Q11 and Q11A as follows:**

Category	Specification
Yes	If Q11A=1
- pre-operative	If Q11A=1 and Q11=1
- at any other time during admission	If Q11A=1 and Q11=2 or 6, 7, 8
- not known	If Q11A=1 and Q11=blank or 9
No	If Q11A=2
Not Known	Q11A=blank or 9

**FIGURE 26: MOBILISED ON DAY OF OR DAY AFTER SURGERY, AND MOBILISED BY**

**Composite variable based on Q12J and Q12J2 as follows:**

Category	Specification
Yes	If Q12J=1
- by physiotherapist	If Q12J=1 and Q12J2=1
- by other	If Q12J=1 and Q12J2=8
- by whom not known	if Q12J=1 and Q12J2=blank or 9
No	If Q12J=2
Not Known	Q12J=blank or 9

## APPENDIX 7: ADDITIONAL INFORMATION

See Appendix 1: Dataset V5 for Question (Q) references.

Q2	TYPE OF TRAUMA	N	%
	High Energy	96	3.04
	Low Energy	2,975	94.18
	Unknown	66	2.09
	Not Documented	4	0.13
	Missing Value	18	0.57
	Total	3,159	100.0
Q9	PATHOLOGICAL	N	%
	Atypical	45	1.42
	Malignancy	48	1.52
	No	2,474	78.32
	Not Documented	283	8.96
	Missing Value	309	9.78
	Total	3,159	100.00
Q10	HISTORY OF PREVIOUS FRAGILITY FRACTURE	N	%
	Yes	688	21.78
	No	2,294	72.62
	Not Documented	125	3.96
	Missing Value	52	1.65
	Total	3,159	100.00
Q11 D	GERIATRICIAN GRADE <sup>(a)</sup>	N	%
	Consultant	1,112	62.86
	Specialist Registrar	150	8.48
	Registrar <sup>(b)</sup>	414	23.40
	Other	12	0.68
	Not Documented	81	4.58
	Total	1,769	100.00
Q12 C	SURGEON GRADE <sup>(c)</sup>	N	%
	Consultant	1,314	43.38
	Specialist Registrar	946	31.23
	Registrar	435	14.36
	SHO <sup>(b)</sup>	27	0.89
	Not Documented	12	0.40
	Missing Value	295	9.74
	Total	3,029	100.00
Q12 D	ANAESTHETIST GRADE <sup>(c)</sup>	N	%
	Consultant	2,196	72.50
	Specialist Registrar	151	4.99
	Registrar	224	7.40
	SHO <sup>(b)</sup>	46	1.52
	Not Documented	87	2.87
	Missing Value	325	10.73
	Total	3,029	100.00

Q17	MULTIDISCIPLINARY REHABILITATION TEAM ASSESSMENT <sup>(D)</sup>	N	%
	Yes	2,724	91.04
	No	191	6.38
	Not Documented	8	0.27
	Missing Value	69	2.31
	Total	2,992	100.00

<sup>(a)</sup> Includes cases assessed by a geriatrician at any time during the acute admission i.e. those with value 1 recorded for Q11 and / or Q11A.

<sup>(b)</sup> Includes 'Other' category which is not itemised separately for patient confidentiality reasons.

<sup>(c)</sup> Relates to surgical cases only i.e. those with values 1-88 recorded for Q12.

<sup>(d)</sup> Excludes patients who died in hospital.

## NOTES



## NOTES



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