Irish Hip Fracture Database National Report 2017

AUTHOR(S)

Emer Ahern, Louise Brent, Aisling Connolly, Fionnola Kelly, Conor Hurson, The Irish Hip Fracture Database Governance Committee, The National Office of Clinical Audit (NOCA)

CITATION

Ahern, Emer; Brent, Louise; Connolly, Aisling; Kelly, Fionnola; Hurson, Conor; Committee, The Irish Hip Fracture Database Governance; et al. (2021): Irish Hip Fracture Database National Report 2017. Royal College of Surgeons in Ireland. Report. https://doi.org/10.25419/rcsi.16962376.v1

DOI

10.25419/rcsi.16962376.v1

National Office of Clinical Audit

Irish Hip Fracture Database IHFD

IRISH HIP FRACTURE DATABASE
NATIONAL REPORT 2017

Better, safer care

FROM BROKEN BONE TO WALKING HOME

REPORT PREPARED BY

Dr Emer Ahern
Irish Hip Fracture Database Clinical Geriatric Lead
Consultant Geriatrician, St Luke's General Hospital, Kilkenny

Louise Brent
Irish Hip Fracture Database Manager
National Office of Clinical Audit

Aisling Connolly
Communications and Events Lead
National Office of Clinical Audit

Fionnola Kelly
Biostatistician
National Office of Clinical Audit

Mr Conor Hurson
Irish Hip Fracture Database Clinical Orthopaedic Lead
Consultant Orthopaedic Surgeon, St. Vincent's University Hospital

WITH ASSISTANCE FROM THE IHFD GOVERNANCE COMMITTEE

Dr Michael Carton, Senior Scientist, Measurement for Improvement Team, Quality Improvement Division, Health Service Executive

Dr Tara Coughlan, National Speciality Director for Geriatric Medicine, RCPI, Consultant Geriatrician, Tallaght University Hospital

Maureen Cronin, Assistant Chief Finance Officer, Activity-Based Funding/Healthcare Pricing Office, Health Service Executive

Catherine Farrell, Programme Manager, National Trauma and Orthopaedic Clinical Programme, RCSI

Michelle Fitzgerald MISCP, Senior Physiotherapist, Tallaght University Hospital

Ursula Kelleher, Irish Hip Fracture Database Audit Coordinator, St. Vincent's University Hospital

Mr Paddy Kenny, Consultant Orthopaedic Surgeon, Clinical Lead, National Trauma and Orthopaedic Clinical Programme, RCSI

Dr Michael Looney, Consultant Anaesthetist, Connolly Hospital Blanchardstown

Sheila McGuinness, Chief Operations Officer, RCSI Hospitals

Prof C Geraldine McMahon, Consultant in Emergency Medicine, St James's Hospital

Bibiana Savin, Public and Patient Interest (PPI) Representative, Sage Advocacy

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.

Citation for this report:
National Office of Clinical Audit, (2018)
Irish Hip Fracture Database National Report 2017.
Dublin: National Office of Clinical Audit.

ISSN 2565-537X (Print)
ISSN 2565-5388 (Online)

Electronic copies of this report can be found at:
https://www.noca.ie/publications

This report was published on 29th November 2018

ACKNOWLEDGMENTS

This work uses data provided by patients and collected by their healthcare providers as part of their care. NOCA would like to thank the valuable contribution of all participating hospitals, in particular the Irish Hip Fracture Database 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 Philip Dunne, IT Systems Support from the Healthcare Pricing Office, who provides ongoing support for the HIPE portal.

IITOS THE IRISH INSTITUTE OF TRAUMA AND ORTHOPAEDIC SURGERY

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.

Feidhmeannacht na Seirbhíse Sláinte Health Service Executive
Quality Improvement Division

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.

RCSI

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.

For more information about this report, contact National Office of Clinical Audit, 2nd Floor, Ardilaun House, Block B, 111 St Stephen's Green, Dublin 2, D02 VN51 **Tel:** +353 (1) 402 8577 **Email:** ihfd@noca.ie

DESIGNED BY SWERVE

NOCA National Office of Clinical Audit

Irish Hip Fracture Database IHFD

Irish Hip Fracture Database

National Report 2017

Better, safer care

NOCA National Office of Clinical Audit

Mr Conor Hurson & Dr Emer Ahern
National Clinical Leads
Irish Hip Fracture Database
National Office of Clinical Audit
2nd Floor, Ardilaun House
111 St. Stephen's Green,
Dublin 2

2nd October, 2018

IRISH HIP FRACTURE DATABASE NATIONAL REPORT 2017

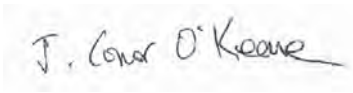
Dear Mr Hurson / Dr Ahern,

I acknowledge receipt of the Irish Hip fracture Database National Report 2017. Following presentation by Dr Hurson to the NOCA Governance Board on the 27th 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

National Office of Clinical Audit
2nd Floor
Ardilaun House, Block B
111 St Stephen's Green
Dublin 2, D02 VN51
Tel: + (353) 1 402 8577
Email: auditinfo@noca.ie

CONTENTS

CONTENTS

TABLES

FIGURES

FIGURES

CAPTURING PATIENT PERSPECTIVES

I feel privileged to be the Patient and Public Interest (PPI) representative on the IHFD Governance Committee and have the opportunity to contribute to the work done by this group of clinical and allied healthcare professionals. I joined this committee in December 2017 and have had numerous occasions to meet my colleagues, attend meetings and more recently, engage in a project to capture the patient perspectives in the IHFD.

The project 'Capturing Patients Perspectives', which is currently ongoing for IHFD and other NOCA audits, is of particular interest to me, given my role as an advocate for patients in hospitals and vulnerable people in general.

Ultimately, the inclusion of a PPI representative in the IHFD Governance Committee compliments this mix of knowledge and expertise. It will be essential for enhancing patient's experience in a variety of settings across the healthcare system and to a broader audience for the NOCA reports and website resources.

The work that NOCA is currently undertaking will ensure that the perspectives and experiences of patients are a central focus point for this audit.

Bibiana Savin,
Sage Advocacy
IHFD Public and Patient Interest (PPI) Representative

EXECUTIVE SUMMARY

This report is testament to the commitment of all the participating hospitals to the Irish Hip Fracture Database (IHFD) and the focus on providing hip fracture patients with care that is aligned to international best practice standards. The report also highlights the continuing variability in all standards at hospital level. The IHFD allows hospitals and hospital groups to measure their care at hospital, inter-hospital and national levels. This year, the 2017 IHFD report marks a departure from the Blue Book Standards (British Orthopaedic Association, 2007). As the IHFD has evolved, so too has the way we measure our hip fracture care in Ireland. From now on, the standards of care will be known as the Irish Hip Fracture Standards (IHFS) as determined by the Irish Hip Fracture Database Governance Committee.

KEY FINDINGS

- **Data coverage of 95% was achieved for this report, which represents an increase of 9% since 2016.**
- **There continues to be variation in the standards of care provided at individual hospital level.**
- **Ninety-two percent of patients are being brought directly to the hospital where they will be operated on. The increase in the number of such patients follows the successful implementation of the hip fracture bypass initiative by the Clinical Programme for Trauma and Orthopaedic Surgery in conjunction with the Health Service Executive (HSE) Acute Hospitals Division and the National Ambulance Service.**
- **Compliance with IHFS 1 (percentage of patients admitted to the orthopaedic ward or direct to theatre from ED within four hours) remains low, with only 11% of patients admitted to an orthopaedic ward within four hours.**
- **Fourteen participating hospitals reduced their pressure ulcer incidence (IHFS 3) in 2017; a decrease from 5% in 2016 to 3% in 2017.**
- **In 2017, fewer patients were reviewed by a Geriatrician (50%), fewer had a bone health assessment (73%), and fewer received a specialist falls assessment (47%) compared with the numbers recorded in 2016.**
- **Key indicators associated with patients being discharged home include:**
  - **(i) Having a Lower American Society of Anesthesiologists (ASA) Grade (ASA 1 = Healthy person; ASA 2 = Mild systemic disease; ASA 3 = Severe systemic disease; ASA 4 = Severe systemic disease that is a constant threat to life; ASA 5 = A moribund person who is not expected to survive without the operation)**
  - **(ii) Having a high pre-fracture functional level (defined by new mobility score (NMS).**
  - **(iii) Receiving surgery within 48 hours.**
  - **(iv) Being younger.**

Access to the right hospital for the right care is key for hip fracture patients; however, providing timely equity of access is a challenge for most hospitals in Ireland. This is most relevant for IHFS 1 (admitting patients through the emergency department (ED) to the orthopaedic ward or direct to theatre within four hours). Timely surgery as per IHFS 2 (percentage of patients receiving surgery within 48 hours) and early mobilisation are also proving challenging for many hospitals in Ireland.

The Pressure Ulcers to Zero (PUTZ) Collaborative, which was established by the HSE Quality Improvement Division (QID) in order to reduce the number of pressure ulcers in patients in Ireland, has proved successful, as almost all of the participating hospitals have improved their performance in the implementation of patient pressure ulcer reduction (IHFS 3) measures since 2016.

Managing older patients who are recovering from bone fractures is challenging. These patients have had a substantial pathophysiological insult as a result of their fracture; they also have other medical, psychological, social and functional issues that need to be identified and addressed. The international literature shows clearly that these patients benefit from routine access to an orthogeriatric service and secondary prevention for falls and fractures.

The response to date, shown by IHFS 4 (percentage of patients seen by a geriatrician), has resulted in the development of services in half of the participating hospitals and so a focus on this standard must continue.

KEY RECOMMENDATIONS

HOSPITAL GOVERNANCE

- **Development of a Hip Fracture Governance Committee (HFGC) in each hospital supported by the guidance issued by the National Office of Clinical Audit (NOCA).**
- **The HFGC to have a clear focus on quality improvement to reduce variability in the standards of care.**

CLINICAL CARE

- **HFGC to standardise pathways of care for hip fracture patients to ensure timely access to orthopaedic ward or theatre.**
- **Hospitals to provide surgery and early mobilisation to patients with hip fractures seven days per week.**
- **Hospitals to provide an orthogeriatric service for all hip fracture patients.**

DATA QUALITY

- **Hospitals to submit data in a timely manner to achieve above 90% data coverage quarterly and annually.**
- **NOCA, in collaboration with the Healthcare Pricing Office (HPO), continue to enhance the functionality of the IHFD Portal to include additional data quality checks and reporting.**

IHFD DEVELOPMENT

- **NOCA will progress the development of long-term outcome measures for the IHFD.**

CHAPTER 1
INTRODUCTION

CHAPTER 1: **INTRODUCTION**

Welcome to the Irish Hip Fracture Database (IHFD) National Report 2017.

The IHFD is a clinically led, web-based audit which measures the care and outcomes of patients with hip fractures. The IHFD grew out of a collaboration between the Irish Gerontological Society (IGS) and the Irish Institute for Trauma and Orthopaedic Surgery (IITOS). The National Office of Clinical Audit (NOCA) was established in 2012 and has a specific focus on turning clinical data into quality information through national clinical audits. Since 2013, the IHFD has been under the operational governance of NOCA.

A recently published study on emerging trends in hospitalisation for fragility fractures in Ireland (Kelly et al., 2018) found that the absolute number of all fragility fracture admissions increased by 30% between 2000 and 2014 for both men (40% increase) and women (27% increase). Inpatient bed days for osteoporotic fractures have increased by 51%, with hip fractures dominating these admissions (37%) and accounting for almost half (47%) of all bed days.

This is the fifth IHFD national report produced by NOCA. Since its commencement in 2012, the IHFD has gathered data on over 13,500 hip fracture patients in Ireland. Due to the maturing nature of the audit, it is now possible to publish validated comparisons in care and outcomes at hospital level. The IHFD has also established itself on the international stage as an audit comparable with other national hip fracture audits (Johansen et al., 2017).

The theme for this report is 'from broken bone to walking home', in Chapter 8, a subgroup analysis details the group of hip fracture patients who are discharged directly home from the acute hospital.

In 2016, the IHFD moved to hospital-level reporting across a number of data quality and clinical standards. This represents a significant milestone in the development of the audit and is a testament to the hard work of the local audit coordinators and clinical leads.

To date, all 16 eligible hospitals are regularly uploading data to the IHFD. NOCA feeds back this information to the hospitals and hospital groups quarterly. Each hospital, through the formation of a hospital hip fracture governance committee (HFGC), is encouraged to use these reports for continuous quality improvement.

A pilot programme of a Best Practice Tariff (BPT) for meeting the clinical and data quality standards for hip fracture care is in development in 2018 and will present hospitals with another opportunity to improve care and receive reimbursement for that care. This pilot is being conducted by the Healthcare Pricing Office (HPO), NOCA, and the National Trauma and Orthopaedic Clinical Programme. A second pilot to reform the Health Service Executive (HSE) Key Performance Indicator (KPI) for hip fracture surgery is being undertaken. The data from the IHFD will be used to calculate Irish Hip Fracture Standard two (the percentage of hip fracture patients receiving surgery within 48 hours and within normal working hours). In 2019, it is envisaged that this KPI will solely use the IHFD data.

The IHFD report has evolved from the original Blue Book Standards (British Orthopaedic Association, 2007) to align with the Irish context; therefore, the standards used will now be called the Irish Hip Fracture Standards (IHFS). This report offers the opportunity for patients and carers, patient organisations, healthcare professionals, hospital managers, hospital group CEOs, and policy-makers to reflect on the standard of care being provided to hip fracture patients both locally and nationally. In this report, we also include a survey of HFGCs in the 16 participating hospitals. A summary report of key information, findings, and recommendations will be made available and may be of particular interest to patients, patient organisations, and the public. Each hospital will be issued its own hospital report.

NOCA is dedicated to achieving excellence in healthcare shaped by reliable data. Incorporating the voice of the patient into the IHFD national report has been a key area of progress in 2017 and 2018, with the addition of a PPI representative to the IHFD Governance Committee and a series of workshops focusing on the development of capturing patient stories in collaboration with NOCA and the HSE Quality Improvement Division. This work is ongoing.

The key recommendations from this report provide a focus for what we need to achieve in the short term and in the longer term.

Future work for the IHFD will include a quality improvement workshop in quarter four of 2018, further PPI representative involvement, developing patient-reported outcome measures (PROMs) in the longer term and expanding the research portfolio.

AIM AND OBJECTIVES

In the past two years, the IHFD has matured from being implemented in all 16 participating hospitals to now being operational in all sites. Therefore, the aim and objectives of the audit have evolved. The focus of the audit is now on collecting high-quality data and using this data for quality improvement.

OUR AIM

→ **Maintain a prospective database of all patients in Ireland aged 60 years and over with a hip fracture in order to drive continuous quality improvement for better, safer care.**

OBJECTIVES

1. **Improve and support the collection of high-quality data on all hip fractures in Ireland for local and national reporting using the following dimensions: relevance; accuracy and reliability; timeliness and punctuality; coherence and comparability; accessibility and clarity (Health Information and Quality Authority (HIQA),2018).**
2. **Continue updating the dataset and ensure that the set of measures included remain relevant to the Irish healthcare setting and are meaningful for both clinical staff and service users.**
3. **Disseminate the outputs from the data in a timely manner and report any data or performance concerns back to the relevant stakeholders.**
4. **Support/promote the use of IHFD data for improvement of care at local and national level.**
5. **Benchmark hip fracture care and outcomes nationally and internationally.**
6. **Support high-quality data provision for research.**
7. **To collect longer-term outcome data.**

TABLE 1:

HOSPITALS AND PEOPLE WE WORK WITH

NOTE: Dublin Hospitals have been displayed collectively by hospital group

SAOLTA UNIVERSITY HEALTH CARE GROUP
Letterkenny University Hospital
Mayo University Hospital
Sligo University Hospital
University Hospital Galway

RCSI HOSPITALS
Beaumont Hospital
Connolly Hospital
Our Lady of Lourdes Hospital, Drogheda

DUBLIN MIDLANDS HOSPITAL GROUP
Midland Regional Hospital, Tullamore
St James's Hospital, Dublin
Tallaght University 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

LETTERKENNY UNIVERSITY HOSPITAL
IHFD AUDIT COORDINATOR: Bruce MacGregor
IHFD CLINICAL LEAD: Mr. Peter O'Rourke

SLIGO UNIVERSITY HOSPITAL
IHFD AUDIT COORDINATOR: AnnMarie Mullen
IHFD CLINICAL LEAD: Mr William Gaine

MAYO UNIVERSITY HOSPITAL
IHFD AUDIT COORDINATOR: Francis Power
IHFD AUDIT COORDINATOR: Orla Duggan
IHFD CLINICAL LEAD: Mr. Derek Bennett

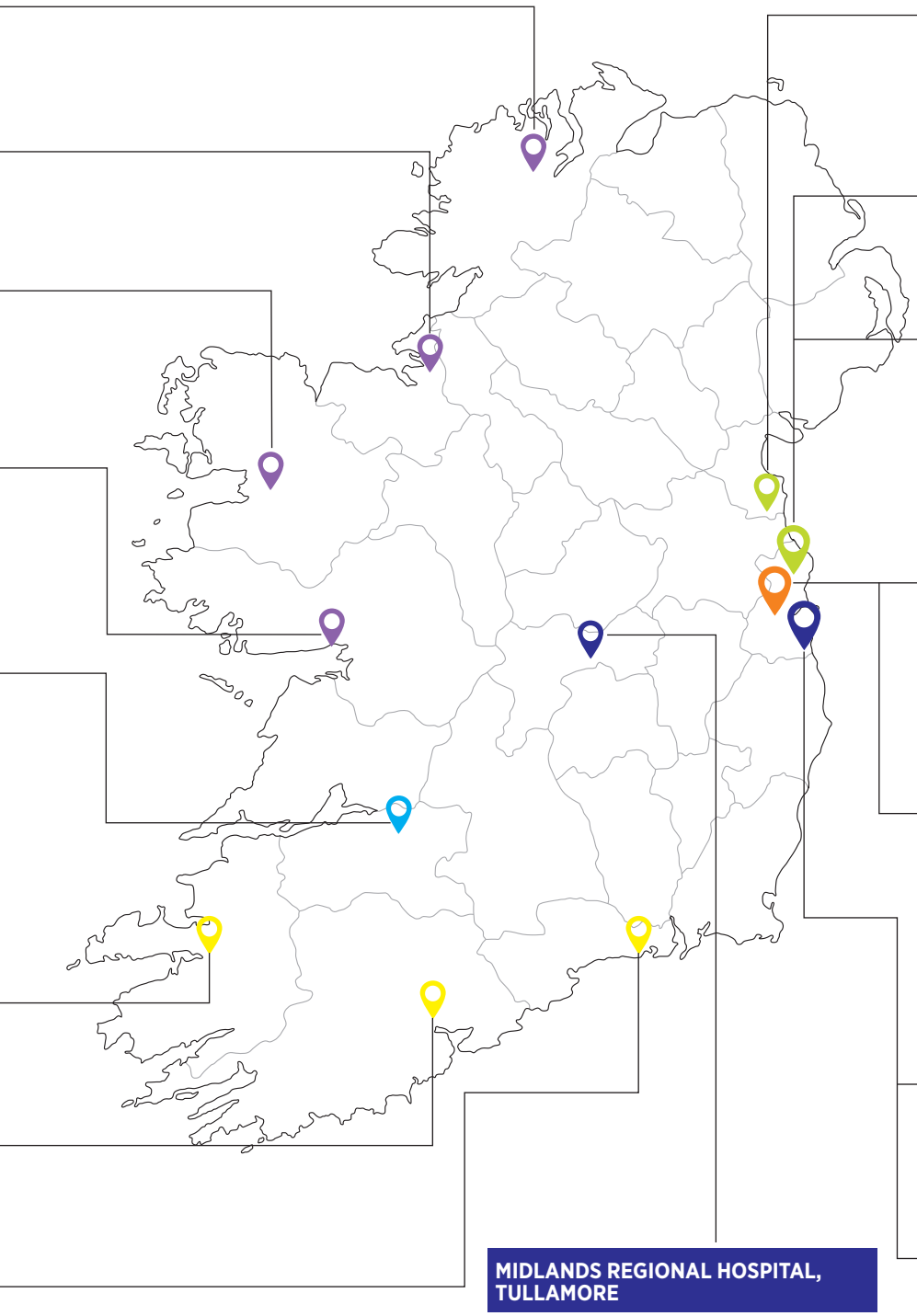
UNIVERSITY HOSPITAL GALWAY
IHFD AUDIT COORDINATOR: Louise Brennan
IHFD CLINICAL LEAD: Mr. Colin Murphy

UNIVERSITY HOSPITAL LIMERICK
IHFD AUDIT COORDINATOR: Pamela Hickey
IHFD AUDIT COORDINATOR: Paula Lynch
IHFD CLINICAL LEAD: Mr Finbarr Condon
IHFD CLINICAL LEAD: Dr Jude Ryan

UNIVERSITY HOSPITAL KERRY
IHFD AUDIT COORDINATOR: Esther O'Mahony
IHFD CLINICAL LEAD: Mr John Rice

CORK UNIVERSITY HOSPITAL
IHFD AUDIT COORDINATOR: Toni O'Keeffe
IHFD CLINICAL LEAD: Mr Shane Guerin

UNIVERSITY HOSPITAL WATERFORD
IHFD AUDIT COORDINATOR: Lorraine Smith
IHFD CLINICAL LEAD: Ms May Cleary



OUR LADY OF LOURDES HOSPITAL, DROGHEDA

IHFD AUDIT COORDINATOR: Pheadra McCleery
IHFD CLINICAL LEAD: Mr Alan Walsh

BEAUMONT HOSPITAL

IHFD AUDIT COORDINATOR: Aisling Murphy
IHFD CLINICAL LEAD: Dr Linda Brewer

CONNOLLY HOSPITAL

IHFD AUDIT COORDINATOR: Jacinta Shields
IHFD CLINICAL LEAD: Mr Paddy Kenny

MATER MISERICORDIAE UNIVERSITY HOSPITAL

IHFD AUDIT COORDINATOR: Ray Gunapala
IHFD CLINICAL LEAD: Mr. James Cashman
IHFD CLINICAL LEAD: Prof Joe Duggan
IHFD CLINICAL LEAD: Dr Joanna McGlynn

ST VINCENT'S UNIVERSITY HOSPITAL

IHFD AUDIT COORDINATOR: Ursula Kelleher
IHFD CLINICAL LEAD: Dr Rachael Doyle
IHFD CLINICAL LEAD: Mr. Conor Hurson

ST JAMES'S HOSPITAL

IHFD AUDIT COORDINATOR: Alison Reynolds
IHFD CLINICAL LEAD: Mr. Tom McCarthy
IHFD CLINICAL LEAD: Dr. Ger McMahon

TALLAGHT UNIVERSITY HOSPITAL

IHFD AUDIT COORDINATOR: David Askin
IHFD CLINICAL LEAD: Dr. Tara Coughlan
IHFD CLINICAL LEAD: Mr. Brendan O'Daly

MIDLANDS REGIONAL HOSPITAL, TULLAMORE

IHFD AUDIT COORDINATOR: Breda Conlon
IHFD CLINICAL LEAD: Ms Dorothy Niall

KEY HIGHLIGHTS 2017

95%

95% of all hip fracture cases captured on IHFD

92%

92% of patients brought direct to the operating hospital

11%

11% of patients admitted to an orthopaedic ward within four hours IHFS 1

69%

69% received surgery within 48 hours IHFS 2

14

Pressure Ulcers to Zero

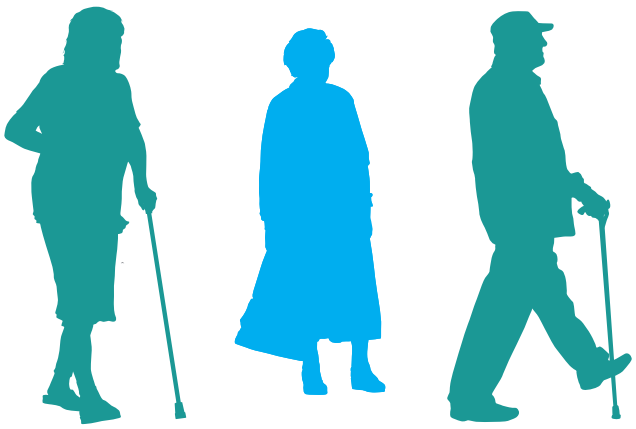
14 hospitals reduced their pressure ulcer incidence IHFS 3

50%

50% of patients reviewed by a geriatrician IHFS 4

73%

73% of patients received a bone health assessment IHFS 5



47%

47% of patients had a specialist falls assessment IHFS 6

77%

77% of patients mobilised day of or day after surgery

13

The median length of stay for all patients was 13 days

CHAPTER 2
METHODOLOGY

CHAPTER 2: **METHODOLOGY**

The IHFD collects data on hip fracture patients through a portal on the Hospital In-Patient Enquiry (HIPE) system in collaboration with the HPO. Data from the HIPE system, such as age, gender, admission source, etc., is merged with additional IHFD data.

INCLUSION CRITERIA

Analysis is based on IHFD records as captured on the HIPE Portal software. It includes cases that were:

(i) Discharged from 1 January 2017 to 31 December 2017 inclusive (the HIPE data file used was 2017_V17)

(ii) Diagnosed on HIPE with either a hip fracture due to injury or with a specified type of fracture, other than periprosthetic, on IHFD add-on screens, and

(iii) Aged 60 years or older.

EXCLUSION CRITERIA

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

DATA COLLECTION

In each of the participating hospitals, the data are entered by local IHFD audit coordinators, with guidance and support from the local IHFD Clinical Lead and NOCA. Currently, all participating hospitals are providing data, but data entry continues to be challenging in some hospitals as very few audit coordinators are being provided with protected time to collect, enter, review, and utilise the data.

The IHFD reports on data coverage, case mix, the patient's pathway, outcomes, and specific hip fracture care standards, which are detailed further in Chapter 3 Data Quality.

IRISH HIP FRACTURE STANDARDS

This year, the *IHFD National Report 2017* marks a departure from the traditional Blue Book Standards (British Orthopaedic Association, 2007). As the IHFD has evolved, so too has the way we measure our hip fracture care in Ireland. From now on, the standards of care will be called the Irish Hip Fracture Standards (IHFS), as determined by the Irish Hip Fracture Database Governance Committee.

This timely change will coincide with the introduction of a pilot Best Practice Tariff (BPT) for hip fractures, the focus of which will be eight core measures, six clinical measures, and two data quality and governance measures. Table 2 describes the current IHFS standards and the new definitions under the BPT.

In 2016, the IHFD moved to hospital-level reporting for the six standards; this is demonstrated again for 2017 in Chapter 4, with the addition of a comparison graph depicting individual hospital performance for 2016 and 2017.

TABLE 2: DEFINITION OF IHFS AND BPT MEASURES

Irish Hip Fracture Standards	Best Practice Tariff measures
IHFS 1: All patients with hip fracture should be admitted to an acute orthopaedic ward within four hours of presentation or brought directly to the theatre from the emergency department (ED) within four hours.	Percentage of patients admitted to an orthopaedic ward within four hours or brought directly to the theatre from the ED within four hours. If patients are admitted to an orthopaedic ward within four hours of presentation, or if they go straight from the ED to the theatre within four hours, they meet IHFS 1.
IHFS 2: All patients with hip fracture who are medically fit should have surgery within 48 hours of admission, and during normal working hours (Monday to Sunday, 08:00–17:59 hours).	Percentage of patients who had surgery within 48 hours and during working hours. If patients receive surgery within 48 hours and during normal working hours, they meet IHFS 2.
IHFS 3: All patients with hip fracture should be assessed and cared for with a view to minimising their risk of developing a pressure ulcer.	Patients recorded as having a Grade 2 or higher pressure ulcer will not meet IHFS 3. If patients do not develop a new Grade 2 or higher pressure ulcer during admission, they meet IHFS 3.
IHFS 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.	Percentage of patients seen at any time during admission by a geriatrician. If patients are reviewed by a geriatrician at any point during their admission, they meet IHFS 4.
IHFS 5: All patients presenting with a fragility fracture should be assessed to determine their need for therapy to prevent future osteoporotic fractures.	Percentage of patients who received a bone health assessment. If patients receive a bone health assessment, they meet IHFS 5.
IHFS 6: 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 a specialist falls assessment. If patients receive a specialist falls assessment, they meet IHFS 6.
	Minimum data coverage of 90% annually is required by individual hospitals.
	Evidence of a local HFGC must be present in each hospital.

CHAPTER 3
DATA QUALITY

CHAPTER 3: **DATA QUALITY**

DATA QUALITY STATEMENT

The purpose of this data quality statement is to highlight the assessment of the quality of the IHFD 2017 data using internationally agreed dimensions of data quality as laid out in the Guidance for a Data Quality Framework (HIQA, 2018). An overview of the aim and objectives of the IHFD data collection is included in Chapter 1 Introduction (Page 15). The IHFD data source description is detailed in Chapter 2 Methodology (Page 22). The data quality statement identifies strengths and areas for improvement e.g. inclusion of new physiotherapy data fields, and the development of a data calendar. An overview of the assessment of IHFD against the dimensions of data quality is presented in Table 3.

TABLE 3: ASSESSMENT OF DATA QUALITY FOR THE IHFD

Dimensions of data quality	Definition (HIQA Guidance, 2018)	Assessment of dimension (IHFD)
Relevance	**Relevant data meets the current and potential future needs of users.**	The IHFD updates the dataset annually to ensure all data fields are relevant to the audit. All data fields are reported on in the national report and local hospital annual reports. At hospital level additional fields that may be relevant to that specific hospital can be added for local use only. Monthly teleconferences with the audit coordinators enable any new data fields to be discussed and piloted. In 2017, we introduced two validated physiotherapy fields the Cumulative Ambulatory Score (CAS) and New Mobility Score (NMS) to the national dataset.
Accuracy and reliability	**The accuracy of data refers to how closely the data correctly describe what they were designed to measure. Reliability refers to whether those data consistently measure, over time, the reality of the metrics that they were designed to represent.**	The coverage is reported by hospital since 2016 in the national report and quarterly to the hospitals and hospital groups. Outliers are identified in the report. NOCA worked with the HPO to highlight entries which are now marked as reviewed on the portal to avoid duplications and in-built warnings appear at the point of data entry to reduce data errors. Validation processes are in place and further work is on-going currently to improve this. The IHFD reports the 'not known' and 'not recorded' percentages to demonstrate the completeness for each data field.
Timeliness and punctuality	**Timely data are collected within a reasonable agreed time period after the activity that they measure. Punctuality refers to whether data are delivered on the dates promised, advertised, or announced.**	NOCA issues data collection targets for each hospital to collect a minimum of 90% submission timeliness. The submission timeliness per quarter for 2017 was as follows Quarter 1- 68%, Quarter 2- 74%, Quarter 3- 80%, Quarter 4- 95% (these are cumulative totals). This data is processed and reported (released) to hospitals within two-three weeks, quarterly, one quarter in arrears. NOCA is currently developing a release calendar. These reports highlight the national coverage versus the individual hospital coverage in relation to the data collection target. The national target of 90% data coverage per quarter is now part of the requirements to meet the Best Practice Tariff. The overall coverage for 2017 was 95%.
Coherence and comparability	**Coherent and comparable data are consistent over time and across providers and can be easily combined with other sources.**	The IHFD dataset follows the patient pathway from the point of first presentation to discharge. The focus of the dataset is on six key hip fracture care standards. These standards have evolved from the Blue Book Standards (BOA, BGS, 2007). To suit the Irish context, amendments have been made to standard 1, 2, 4 and 5 (see Table 2). The definitions of the data fields are available at point of data entry and within the IHFD handbook. Monthly teleconferences and annual workshops and hospital visits ensure that the audit coordinators all interpret the definitions correctly.
Accessibility and clarity	**Data are easily obtainable and clearly presented in a way that can be understood.**	The local IHFD portal has inbuilt definitions for each data field at the point of data entry. There are a number of inbuilt reports that can be run by the clinical lead and audit coordinator. All data can be exported locally into excel for further analysis. The frequency tables for the national report analysis are available in the national report and are also sent with the individual hospital reports annually. These reports highlight the data quality locally including the completeness of each field and coverage levels at individual hospital level. For clarity, NOCA has developed a data dictionary and a handbook and holds an annual workshop for the audit coordinators. Additional supports available include: in built and ad hoc reporting facilities within the IHFD portal and the IHFD data dictionary and handbook which are updated annually.

DATA COVERAGE

The final dataset used for this report includes 3,497 cases from 16 participating hospitals, with the number of cases per hospital ranging from 82 to 456. Coverage is defined as the number of hip fracture cases with appropriate hip fracture diagnosis codes on HIPE which have additional IHFD data added to them and who meet the inclusion criteria detailed in Chapter 2 Methodology. An estimate of what coverage[1] that represented all HIPE hip fracture cases for those 16 hospitals combined was calculated at 95%, an increase of nine percentage points from the 86% reported on in 2016. Individual hospital coverage ranges from 64% to 100%. Mayo University Hospital did not meet the data coverage standard again in 2017, despite significant improvement from 2016. A minimum of 90% data coverage is expected from each hospital annually.

95% coverage of hip fracture patients in 2017

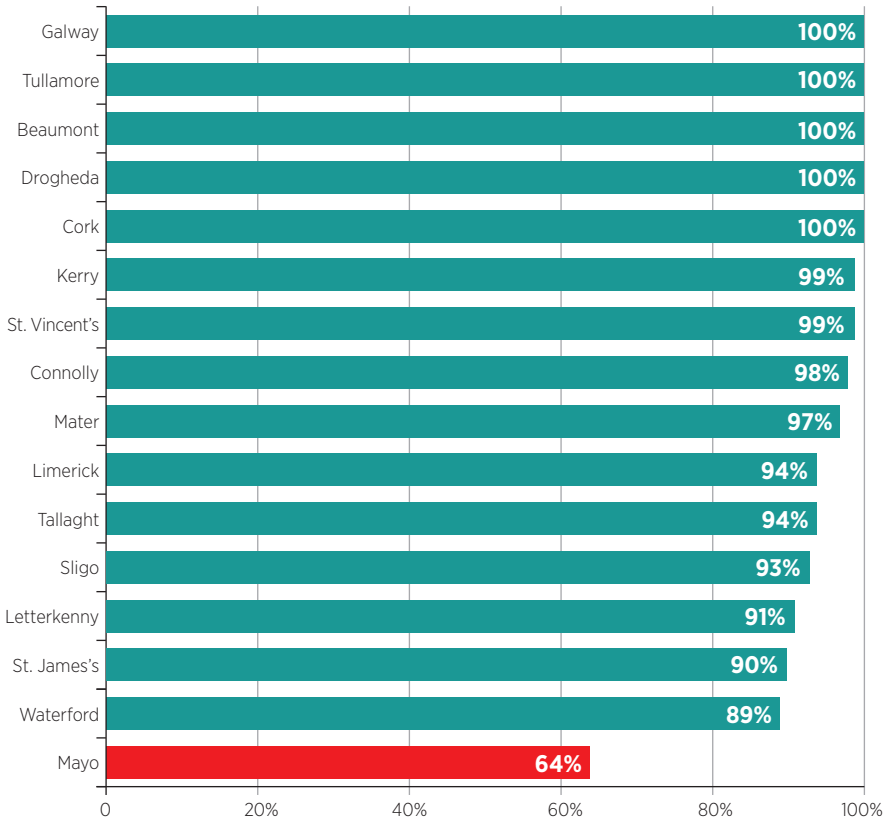


FIGURE 1: COVERAGE PERCENTAGES PER HOSPITAL[1]

[1] Coverage is calculated as the number of IHFD records expressed as a percentage of the total number of hip fracture cases recorded in the HIPE system.

CHAPTER 4
IRISH HIP FRACTURE STANDARDS (IHFS) 2017

IHFS 1:
percentage of patients admitted to an orthopaedic ward within four hours of first presentation or directly to the theatre from the ED within four hours

IHFS 2:
percentage of patients receiving surgery within 48 hours of first presentation (and within normal working hours)

IHFS 6:
percentage of patients receiving a specialist falls assessment

IHFS 3:
percentage of patients developing a pressure ulcer following admission

IHFS 5:
percentage of patients receiving a bone health assessment

IHFS 4:
percentage of patients reviewed by a geriatrician at any point during admission

CHAPTER 4: IRISH HIP FRACTURE STANDARDS (IHFS) 2017

This chapter will focus on the individual hospitals' performance across the six IHFS for clinical care. Each IHFS will include a figure showing the performance for the current reporting year (2017), and the second figure will show the hospitals' performance for 2016 and 2017. This information is intended to allow hospitals to benchmark their individual performance against their previous performance and against other hospitals' performance.

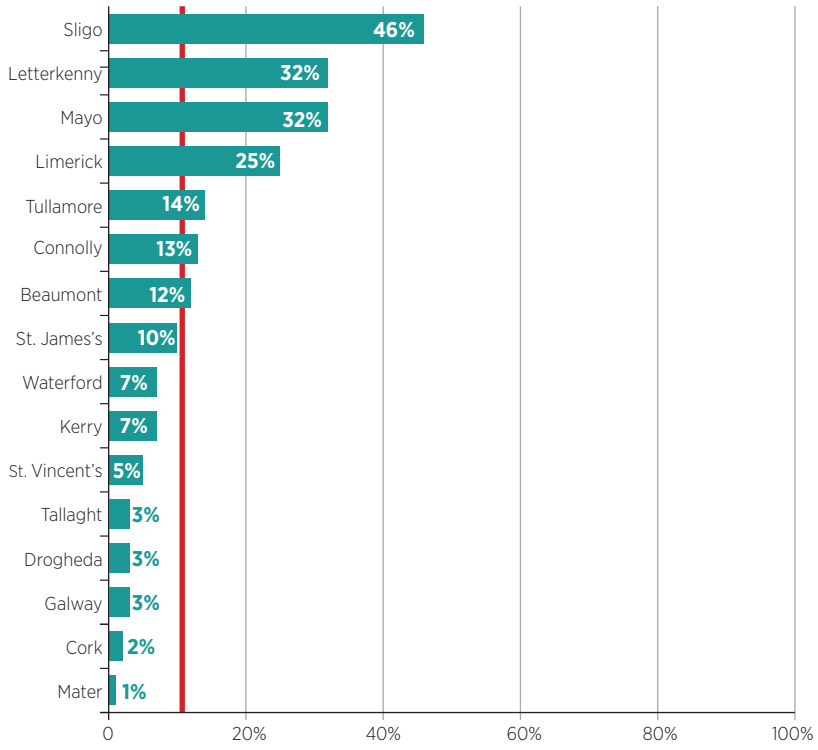
Since 2016, the IHFD has encouraged hospitals, hospital groups, and healthcare staff to use the data locally and nationally for quality improvement. NOCA also continues to strive towards making the data as accessible and relevant for this purpose as possible. This year a hospital story will feature after each IHFS. This hospital was selected as an exemplar in that particular standard due to either performing consistently well or for making a big improvement.

IHFS 1

IHFS 1: PERCENTAGE OF PATIENTS ADMITTED TO AN ORTHOPAEDIC WARD WITHIN FOUR HOURS OF FIRST PRESENTATION OR DIRECTLY TO THE THEATRE FROM THE ED WITHIN FOUR HOURS

Overall, 88% (n=3,062) of patients were admitted to an orthopaedic ward, but only 11% (n=389) were admitted to a ward within four hours or were admitted to the theatre from the ED within four hours (Figure 2). For cases admitted via the ED, the time interval is calculated from time of first arrival at the ED, whether in the first presenting hospital or in the operating hospital. The data published in the 2016 IHFD report was reanalysed for this report to match the new criteria. Compliance with this standard continues to be very low. Very few of the hospitals experienced an improvement in this standard for 2017 (Figure 2A). In hospitals where there is a particular priority or alert assigned to hip fractures, it is clear that more patients are meeting this standard. A lot of work is required in order to address this issue nationally and locally.

The median time for admission to an orthopaedic ward is 8 hours, and the mean is 31 hours.

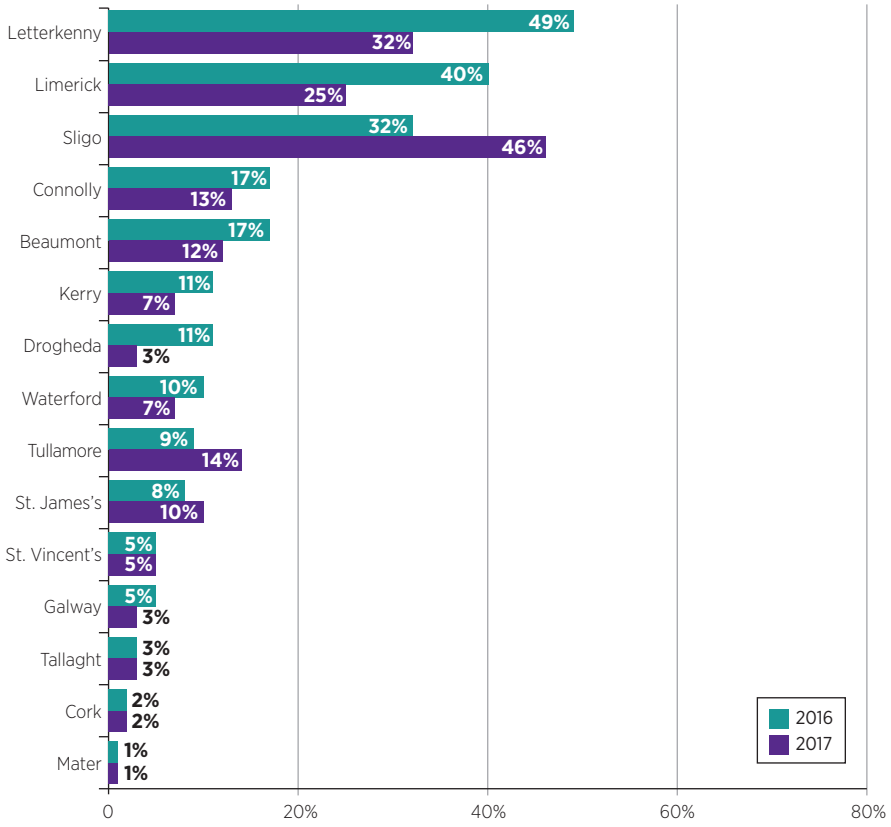


The red line indicates the national average (mean).

Only 11% of patients were admitted to a ward or theatre from ED within four hours

FIGURE 2 IHFS 1: PERCENTAGE ADMITTED TO AN ORTHOPAEDIC WARD WITHIN FOUR HOURS, INCLUDING PATIENTS THAT GO STRAIGHT TO THEATRE FROM THE ED, BY INDIVIDUAL HOSPITAL (N=3,497)*

* Please note: Percentages may not sum to 100% due to rounding.



Mayo University Hospital was excluded from Figure 2A due to low coverage in 2016.

FIGURE 2A IHFS 1: PERCENTAGE ADMITTED TO AN ORTHOPAEDIC WARD WITHIN FOUR HOURS, INCLUDING PATIENTS THAT GO STRAIGHT TO THEATRE FROM THE ED, BY INDIVIDUAL HOSPITAL PERFORMANCE 2016/2017*

* Please note: Percentages may not sum to 100% due to rounding.

SLIGO UNIVERSITY HOSPITAL (SUH)

In order to achieve IHFS 1 at Sligo University Hospital (SUH), the full cooperation of the multidisciplinary team is required. It is essential to have the support of senior nursing management, and at SUH there is total commitment for implementing the necessary procedures and protocols; in addition, they provide the resources that are vital to achieving these targets.

In 2014, SUH were achieving 11.6% success in IHFS 1. It was recognised that this needed to be addressed in order to improve the patient pathway. A local implementation group was formed consisting of members from orthopaedic and ED nursing and medical teams, senior nursing management, bed managers, and the consultant orthopaedic geriatrician. One of the outcomes was the development of the fast-tracking protocol for these patients from the ED to the orthopaedic ward. Within the ring-fenced orthopaedic ward, there are 10 trauma beds, enabling the speedy transfer of patients from the ED and eliminating unnecessary delays. Standards awareness sessions were held with all the team members, and a poster entitled 'Healing Hipsters in Sligo' was developed to show the audit results; this was displayed in all areas of the orthopaedic department and in the ED.

From left to right: *Back row:* Aoife Mc Partland, Osteoporosis Nurse Specialist; Ann Marie Mullen, IHFD Audit Coordinator; Therese Gallagher, Assistant Director of Nursing; Dr Grainne O'Malley, Orthogeriatrician; Helen O Shea, ED CNM 3; Patrick Gilmartin, Physiotherapist; Dorian Gallagher, Occupational Therapist; Charlie Gillespie, Physiotherapist; Bridie Rooney, Osteoporosis Nurse Specialist. *Front row:* Dr Ankit Singhania, Orthopaedic SHO; Ann Judge, CNM 2 orthopaedic ward

Prior to fast-tracking, all patients were assessed by the ED medical doctor. The orthopaedic doctor was then called to assess, accept, and admit the patients. This often meant lengthy waits for the orthopaedic doctor, who may have been in theatre or attending to ward patients. Now, once the patient presents in the ED with a suspected fractured neck of femur, a fractured neck of femur pathway is initiated and the protocol is followed. A hip X-ray is ordered promptly, and if a definite fracture is established, the orthopaedic team is notified immediately.

With the roll-out of National Integrated Medical Imaging System (NIMIS), the orthopaedic doctor can now view X-rays anywhere in the hospital and liaise by phone with the ED to initiate the fast-tracking system. Early communication with bed management is crucial in order to enable the process of allocating a bed promptly. It is at this point that patients are routinely given a fascia iliaca block for pain relief. The patient can then be fast-tracked to the ward, as set out in the protocol. The success of this femur fracture project depends upon the collaboration of a number of diverse staff at various levels.

The ED team takes responsibility for blood workups, and will also manage any medical complications in patients with comorbidities. It is vitally important that patients with comorbidities, who are not suitable for fast-tracking, are stabilised prior to their transfer. For those patients not meeting the fast-tracking criteria, awareness of better outcomes for all patients when admitted promptly to the orthopaedic ward strengthens the team's commitment to achieving this IHFS.

The objective of IHFS 1 is to admit the patient to the orthopaedic ward within four hours from the time they first present in the ED. As demonstrated by the details in the previous paragraphs, there are a myriad interdependent actions to be carried out by various members of a multidisciplinary team. This is a complex process to manage, and every staff member must be aware of their responsibilities and obligations to achieve the desired end result. The work done to date has produced very positive improvements, but continuous monitoring and regular hip fracture meetings to discuss progress are essential to the continued success of this programme.

IHFS 2

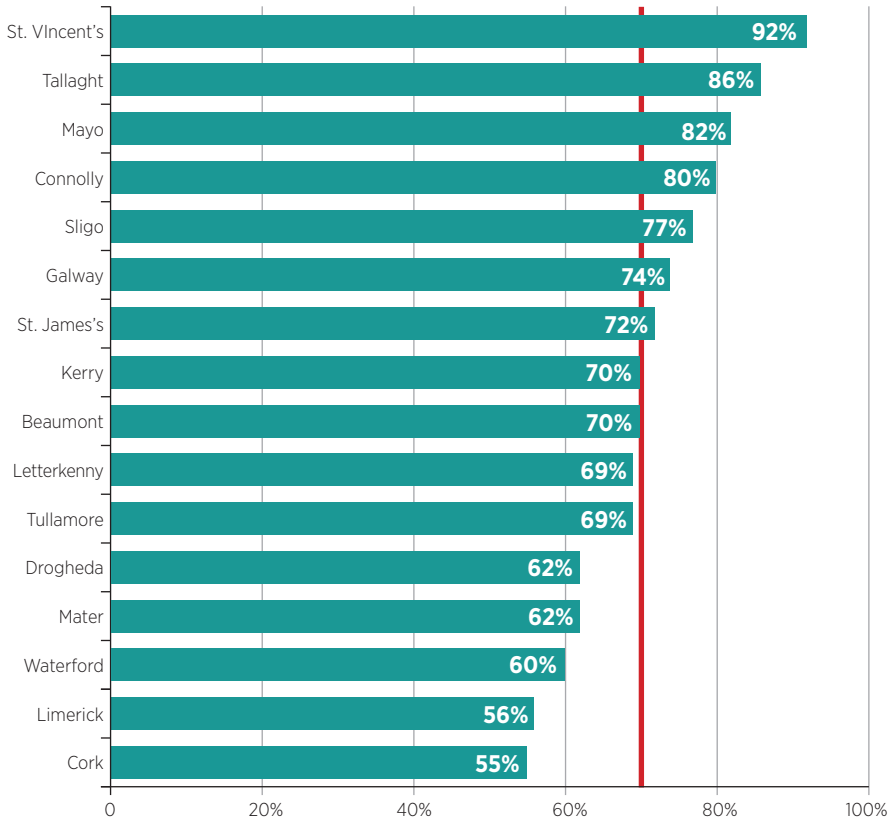
IHFS 2: PERCENTAGE OF PATIENTS RECEIVING SURGERY WITHIN 48 HOURS OF FIRST PRESENTATION (AND WITHIN NORMAL WORKING HOURS)

69% of surgeries were conducted within 48 hours and within normal working hours

In 2017, surgery was carried out on 95% (n=3,336) of patients. Analysis indicates that 69% (n= 2,318) of those surgeries were conducted within 48 hours and during working hours (Monday to Sunday, 08:00–17:59) and 2% (n=61) were conducted outside of working hours (Figure 3). The variance in individual hospital performance is concerning, as surgery for these patients is the single most important intervention.

There was a reduction in the percentage of patients meeting this standard in 10 hospitals between 2016 and 2017, as demonstrated in Figure 3A. Forty-two percent (n=1,395) of surgeries were carried out by a consultant orthopaedic surgeon and 32% (n=1,081) by a specialist registrar (see Appendix 5).

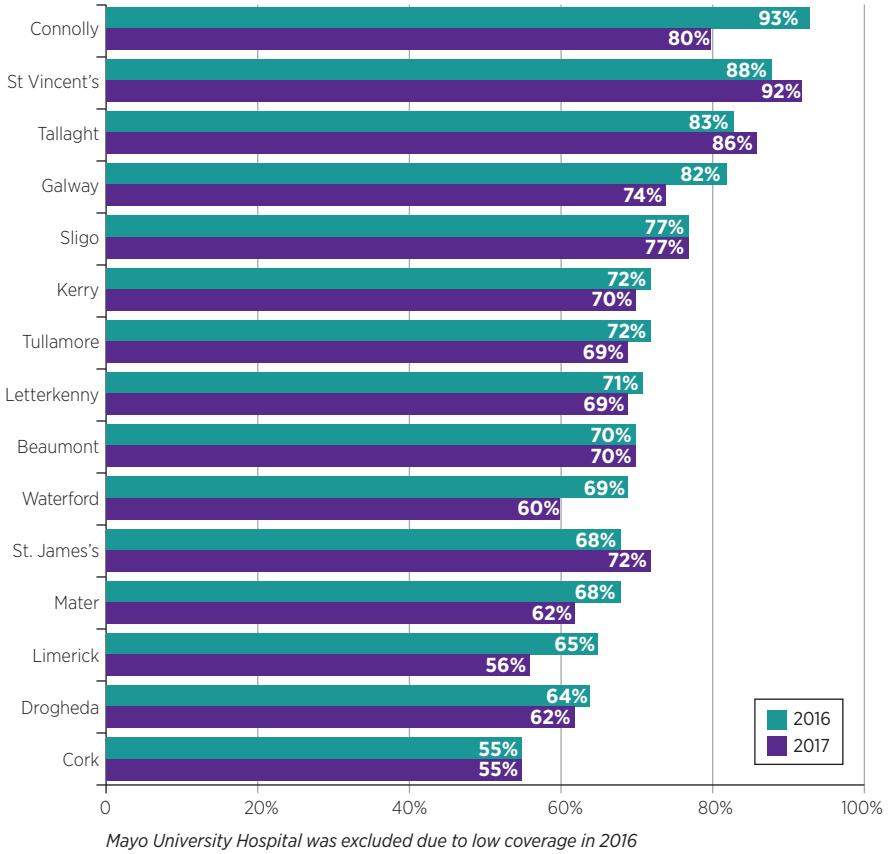
The proportion of patients meeting this standard at the individual hospital level ranges from 55% to 92% (Figure 3). The median time to surgery is 30 hours.



The red line indicates the national average (mean).

FIGURE 3 IHFS 2: PERCENTAGE RECEIVING SURGERY WITHIN 48 HOURS (AND WITHIN NORMAL WORKING HOURS), BY INDIVIDUAL HOSPITAL (n=3,336)[2 *]

[2] 161 patients who did not have surgery were excluded from this analyses
[*] Please note: Percentages may not sum to 100% due to rounding.



Mayo University Hospital was excluded due to low coverage in 2016

FIGURE 3A IHFS 2: PERCENTAGE RECEIVING SURGERY WITHIN 48 HOURS (AND WITHIN NORMAL WORKING HOURS), BY INDIVIDUAL HOSPITAL PERFORMANCE, 2016 AND 2017*

* Please note: Percentages may not sum to 100% due to rounding.

ST. VINCENT'S UNIVERSITY HOSPITAL (SVUH)

St. Vincent's University Hospital (SVUH) is a Dublin-based university-affiliated hospital serving a catchment area of between 350,000 and 450,000 people, with a strong tradition of efficient trauma and hip fracture care. Each year, between 350 and 400 people are admitted with a hip fracture, making it the third-busiest unit for hip fractures in the Republic of Ireland. SVUH is situated in an older catchment area, with nearly 60% of its hip fracture patients aged 80 years and older. A hip fracture group was established in 2012 and has since grown to include all disciplines involved in hip fracture care.

SVUH has consistently performed well in getting patients to theatre within 48 hours of presentation (IHFS 2). In 2017, 92% of patients had surgery within 48 hours (well above the national average of 69%), and 60% had surgery within 24 hours (the national average being 38%). Factors that contribute to this include a seven-day-per-week consultant-led service with trauma theatre access every day, including weekends, as well as direct access to theatre for all trauma patients in the ED, even if an inpatient bed has not been identified.

Recent advances have seen the initiation of a 'Hip Attack' pathway. This pathway starts when an ambulance crew, suspecting a hip fracture, calls ahead to inform the ED. The patient is then brought directly to a 'pitstop' bed (Monday to Friday, 08:00–17:00), where all relevant tests and investigations are carried out prior to transferring the patient to receive X-rays. If the radiographer notes a hip fracture, the patient is transferred to a dedicated hip fracture bed prior to being transferred back to the ED for a nerve block. As part of the pathway, the orthopaedic and orthogeriatric teams are notified early. This enables timely medical reviews, reducing delays to surgery.

The development of a warfarin reversal protocol has reduced approximately 50% of delays to surgery. Protocols for direct oral anticoagulants (DOACs) are under development.

If a hip fracture patient presents early in the day and there is space on the trauma theatre list, theatre staff are informed and the patient is immediately added to the list and surgery is performed that day.

Overall, we feel that these improved efficiencies are a result of the six 'Cs':

- Culture change
- Communication
- Cooperation
- Collaboration
- Commitment, and
- Continuous auditing, monitoring, and feedback.

From left to right: *Front row:* Ursula Kelleher, Orthopaedic Clinical Nurse Specialist; Laura Horan, Falls Prevention Coordinator; Marianne Walsh, ED; Sorcha Burns, ED; Dr Rachael Doyle, Orthogeriatric Consultant; Mini Moby Assistant Director of Nursing; Claire Harnett, CNM1; Prof John Ryan, ED Consultant *Back row:* Mr Conor Hurson, Orthopaedic Consultant; Dr Michael Keyes, Orthogeriatric Registrar; Dr Morgan Crowe, Geriatric Consultant; Breeda Sweeney, Fracture Liaison Service; Dr Lisa Cogan, Rehabilitation Consultant, Karol Byrne, Physiotherapist; Ian Callanan, Clinical Audit Lead; Helen McEnery, Pharmacist. *Missing:* Andrea Marnell, CNM2; Dr Shane O'Hanlon, Orthogeriatric Consultant; Dr Caitriona Tiernan, Rehabilitation Registrar; Naomi Bates, Dietician; Susan van der Kamp, Osteoporosis CNS; Prof Malachi McKenna, Endocrine Consultant; Dr. Nichola Boyle, Community Consultant Physician; Cecily Dawson, Head of Clinical Support; Dr John Cronin, ED Consultant; Susie Downes, Speech and Language Therapy

IHFS 3

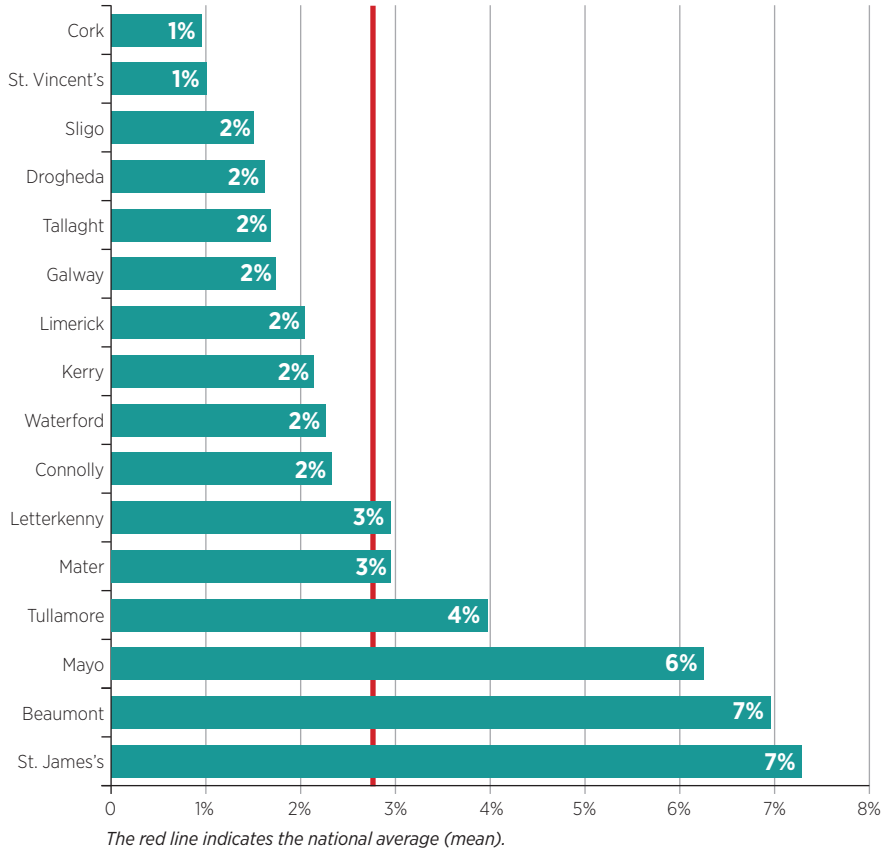
IHFS 3: PERCENTAGE OF PATIENTS DEVELOPING A PRESSURE ULCER FOLLOWING ADMISSION

Of those patients who were discharged alive, 3% (n=85) had pressure ulcers (Figure 4). There has been an improvement in pressure ulcer incidence in fourteen hospitals. For the purpose of this report, pressure ulcers Grade 2 or higher that developed after admission, and no later than 120 days after admission, are included.

There has been an improvement in pressure ulcer incidence in 14 participating hospitals

The Pressure Ulcers to Zero (PUTZ) Collaborative was established and is sponsored by the HSE Quality Improvement Division (QID). The National Quality Improvement Programme has delivered three phases of the PUTZ collaborative that have focused on preventing pressure ulcers within acute, community, and primary care settings. Phase three is based on the Institute for Healthcare Improvement (IHI) (2004) Breakthrough Series Collaborative Model and the Framework for Improving Quality (Health Service Executive Quality Improvement Division, 2016). In phase three, a 68% reduction in newly acquired pressure ulcers was achieved at 12 months period from February 2017 to February 2018 (Health Service Executive, Quality and patient Safety Directorate, 2018). The key safety intervention used within the collaborative is the skin, surface, keep moving, incontinence, nutrition (SSKIN) bundle (Health Service Executive Quality and Quality Improvement Division, 2018).

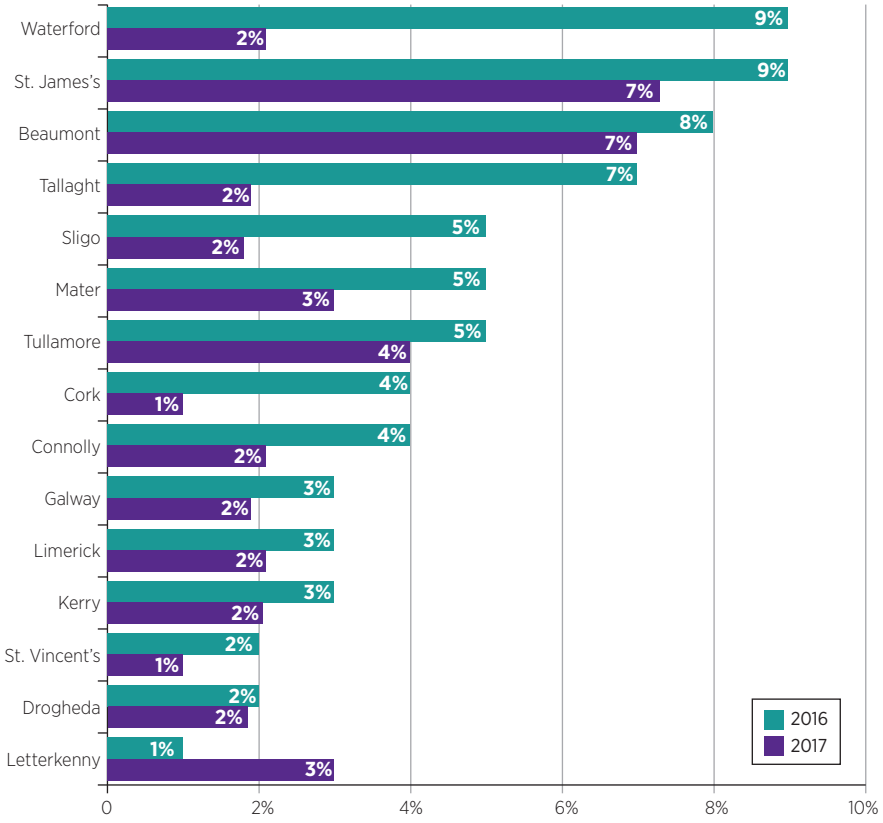
It is encouraging to see that 14 hospitals for who comparative data are available improved their percentage of patient pressure ulcer prevention outcomes in 2017 (Figure 4A). The percentage of pressure ulcers by hospital ranged from 1% to 7%.



The red line indicates the national average (mean).

FIGURE 4 IHFS 3: PERCENTAGE OF PATIENTS WHO DEVELOPED PRESSURE ULCERS FOLLOWING ADMISSION, BY INDIVIDUAL HOSPITAL (n=3,320) [3,*]

[3] 177 patients who died have been excluded from this analyses
[*] Please note: Percentages may not sum to 100% due to rounding.



Mayo University Hospital was excluded from Figure 4A due to low coverage in 2016.

FIGURE 4A IHFS 3: PERCENTAGE OF PATIENTS WHO DEVELOPED PRESSURE ULCERS FOLLOWING ADMISSION, BY INDIVIDUAL HOSPITAL PERFORMANCE, 2016 AND 2017*

* Please note: Percentages may not sum to 100% due to rounding.

UNIVERSITY HOSPITAL WATERFORD (UHW)

From left to right: Martina Rafter Tissue Viability Nurse, Niamh Roche RCSI student physiotherapist, Joanne Long ADON, Rebecca Bown ACNM2, Siobhan Doran SN, Gemma Poole Clinical Placement Coordinator, Nicola Whelton Occupational Therapist, Ruth Butler SN and Lorraine Smith Trauma Coordinator

In the 2016 IHFD report, University Hospital Waterford (UHW) was identified as having the highest incidence of pressure ulcers in patients, and therefore prompt action was taken.

The reduction of pressure ulcer development in patients in the orthopaedic wards with fractured neck of femur has to be attributed to the hard work and dedication of the multidisciplinary team. This work included the ED carrying out early assessment of patients for mattress requirements if there was any delay in providing access to a ward for those patients. The PUTZ Collaborative commenced in March 2017 as part of a quality improvement initiative. Involvement by key stakeholders – encompassing the clinical facilitator (who specialises in orthopaedics), the trauma coordinator, and the orthopaedic team. In addition, the commencement of orthogeriatric ward rounds in June 2017 played a pivotal role in getting patients fit for theatre and discharged in a timely manner; this in turn reduced both the patient's length of stay in hospital and associated risks.

The PUTZ team focused on a holistic approach to patient care, including the introduction of the SSKIN bundle (Gibbons *et al*., 2006) in patients with Waterlow scores greater than 10. As a result, it required the involvement of nursing staff, healthcare assistants, and a wider multidisciplinary team, as well as support from the hospital management team.

The team based on Orthopaedic Ward 2 had three specific objectives:

(i) Reduce the incidence of new pressure ulcer development in our patients
(ii) Educate the multidisciplinary team in the prevention and management of pressure ulcers, and
(iii) Create clearer documentation related to this area.

The roll-out of the PUTZ on the orthopaedic ward involved the adoption of a holistic approach in patient care and, as a team, we raised awareness of areas that required assistance in order to improve pressure area care for patients. Improvement was achieved through feedback from team meetings and regular daily safety pauses. By completing plan, do, study, act (PDSA) cycles, the following changes were highlighted:

(i) Carrying out assessment for appropriate mattress
(ii) Protecting meal times
(iii) Complying with use of appropriate equipment when the patient is off the ward, i.e. pressure-relieving cushions when going for tests such as X-rays
(iv) Changing to a key code sheet for kitchen staff to highlight who needs assistance/monitoring while eating, therefore eliminating missed meals
(v) Introducing SSKIN bundles, and
(vi) Providing patient information leaflets.

The overall quality of patient care was demonstrated on safety crosses and run charts. Feedback from patients and families with regard to the patient information leaflets has also been positive. The effects of a patient getting a pressure ulcer now impact on the whole team, and the vigilance and monitoring of pressure ulcers has enabled UHW to ensure that the SSKIN bundle is completed on appropriate patients and that feedback to staff is provided on a continuous basis. Most importantly, the hospital is doing all it can to protect its patients and to improve and maximise their quality of care within the UHW setting.

IHFS 4

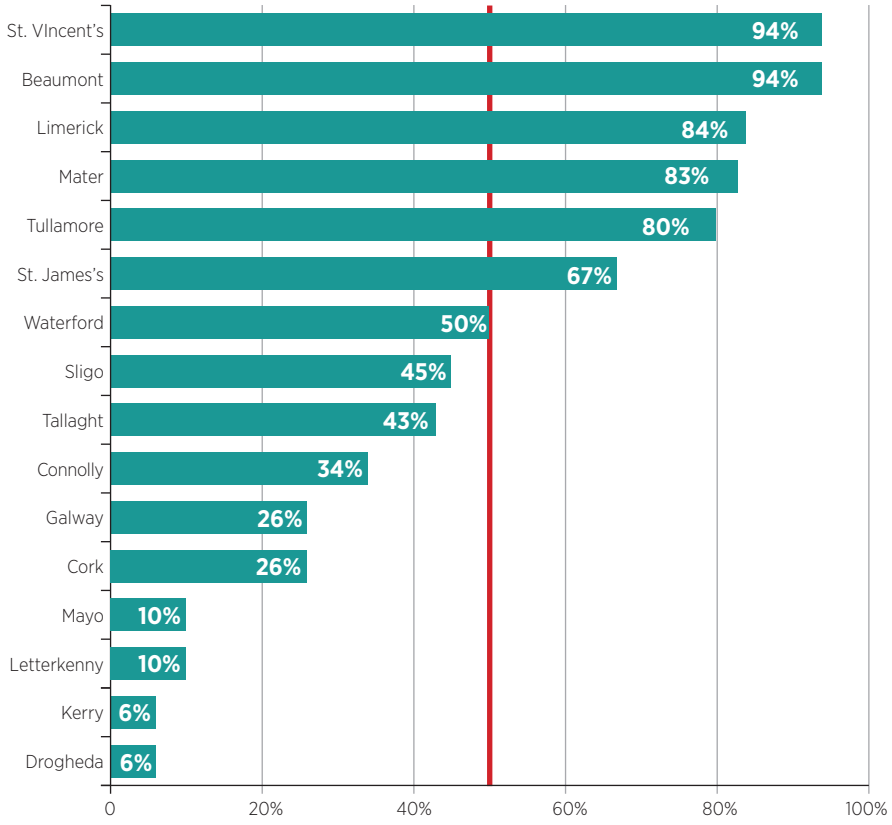
IHFS 4: PERCENTAGE OF PATIENTS REVIEWED BY A GERIATRICIAN AT ANY POINT DURING ADMISSION

50% of patients were reviewed by a geriatrician during their acute hospital stay

Figure 5 shows that nationally, 50% (n=1,754) of patients were reviewed by a geriatrician at some time during their acute stay; and 15% (n=521) were seen pre-operatively. Fifty-six percent (n=987) of these reviews were carried out by a consultant geriatrician (see Appendix 5).

Best practice indicates that a collaborative approach to care, combining Orthopaedics and Geriatrics, is essential for optimal hip fracture care management (National Institute for Health and Care Excellence, 2011). It is associated with a decrease in the acute hospital length of stay, reduced requirement for rehabilitation and duration of same, and fewer patients being discharged into long-term care (Shanahan *et al.*, 2016).

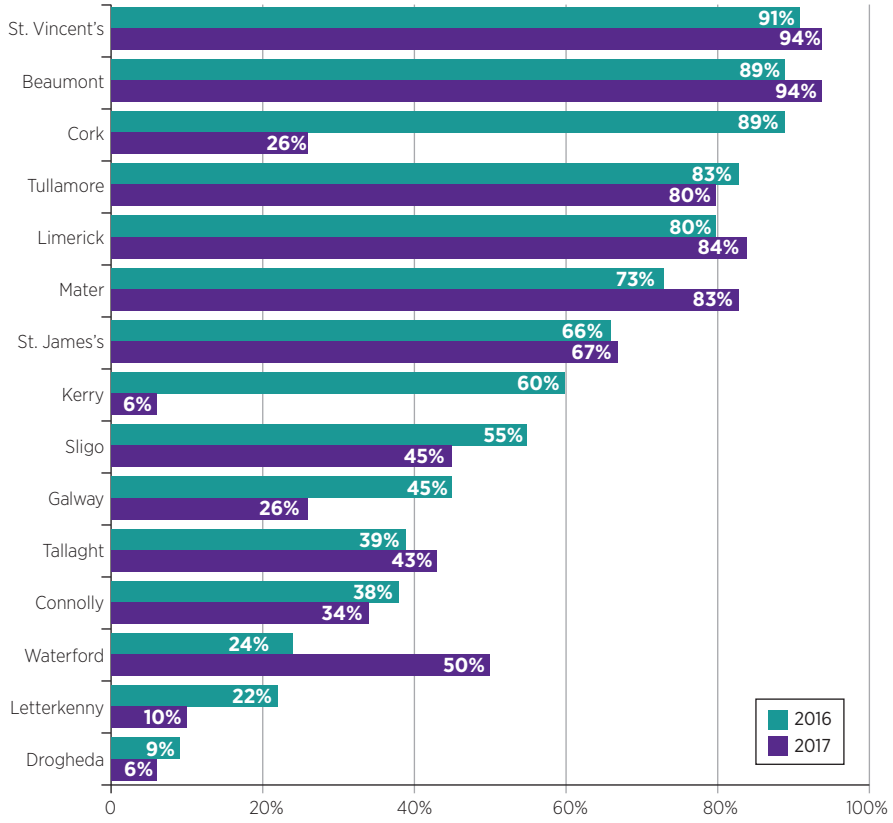
Figure 5A shows that in 2017, seven hospitals experienced an improvement in the percentage of patients being reviewed by a geriatrician, but overall there is still a lot of improvement required for this standard.



The red line indicates the national average (mean).

FIGURE 5 IHFS 4: PERCENTAGE SEEN BY A GERIATRICIAN DURING ADMISSION, BY INDIVIDUAL HOSPITAL (N=3,497)*

* Please note: Percentages may not sum to 100% due to rounding.



Mayo University Hospital was excluded from Figure 5A due to low coverage in 2016.

FIGURE 5A IHFS 4: PERCENTAGE SEEN BY A GERIATRICIAN DURING ADMISSION, BY INDIVIDUAL HOSPITAL PERFORMANCE, 2016 AND 2017*

* Please note: Percentages may not sum to 100% due to rounding.

BEAUMONT HOSPITAL

From left to right: Aoife Gallagher, Senior physiotherapist; Alison McMahon, Medical Social Worker; Dr Avril Beirne, SpR Geriatric Medicine; Dr Linda Brewer, Consultant Geriatrician; Noreen Carolan, Orthopaedic Ward CNM II

The orthogeriatric service at Beaumont Hospital was established in July 2005, at which point the Department of Geriatric Medicine appointed one of their registrars to the orthopaedic ward. This registrar provided a daily presence on the ward, with duties including early review of all newly admitted patients with hip fracture. In addition, there was one weekly ward round led by a consultant geriatrician. Consultant geriatrician governance switched in 2014, shortly after the provision of the Department of Geriatric Medicine's registrar resource became no longer feasible due to staffing challenges within the Department. Beaumont Hospital registered with the IHFD in 2015 and has since been one of the top-performing hospitals for IHFS 4 (the percentage of patients seen by a geriatrician during admission).

Currently, the service is led by one consultant geriatrician with one weekly comprehensive ward round (with orthopaedic interns and the ward Clinical Nurse Manager (CNM), one weekly Multidisciplinary Team (MDT) meeting, and regular liaison with the hospital IHFD audit coordinator. All orthopaedic patients aged over 65 years and any patients aged over 50 years with a fragility fracture are reviewed during this ward round. At Beaumont Hospital, all patients with hip fracture are prioritised for prompt admission to the orthopaedic ward and are reviewed by the consultant geriatrician on the weekly ward round. They are assessed with regard to comorbidities, medications, and any active medical issues. A dedicated IHFD sticker is used to consolidate information on falls history and aetiology, bone therapy, and social/functional baseline. If any patient with hip fracture is on an outlying ward within the hospital, they are highlighted to the geriatrician at the MDT meeting and they are subsequently seen on follow-up consultations.

From July 2018, there will be one additional registrar in the Department of Geriatric Medicine assigned to the orthopaedic ward to provide a daily review of patients where necessary, prioritising those with hip fracture. By national standards, Beaumont Hospital has a very rapidly ageing demographic profile and this is reflected in the orthopaedic non-elective cohort. This ongoing development of the orthogeriatric service will promote efficiency within the service and support ongoing improvements in all six IHFD care standards.

IHFS 5

IHFS 5: PERCENTAGE OF PATIENTS RECEIVING A BONE HEALTH ASSESSMENT

A bone health assessment was carried out on 73% (n=2,407) of patients, with 51% (n=1,701) being commenced or continued on treatment from admission (Figure 6). Twenty-one percent (n=748) of patients were recorded as having a previous fragility fracture (Appendix 5). Ninety-five percent (n=3,328) of all fractures resulted from a low-energy trauma (Appendix 5).

73% of patients had a bone health assessment

Figure 6A shows that nine of the participating hospitals achieved in excess of 80% compliance with this standard in 2017, which is excellent. There is a clear correlation between the level of compliance with this standard and the level of either Orthogeriatric or Fracture Liaison Services (FLS) in the individual hospitals. Figure 6B shows a comparison of individual hospital performance between 2016 and 2017. The data published in the 2016 IHFD report was reanalysed for this report to match the new criteria.

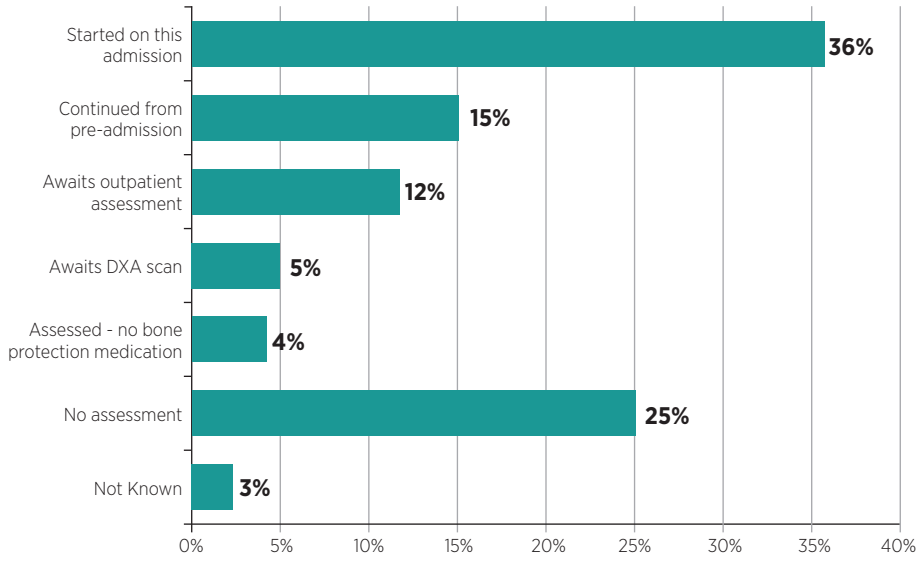
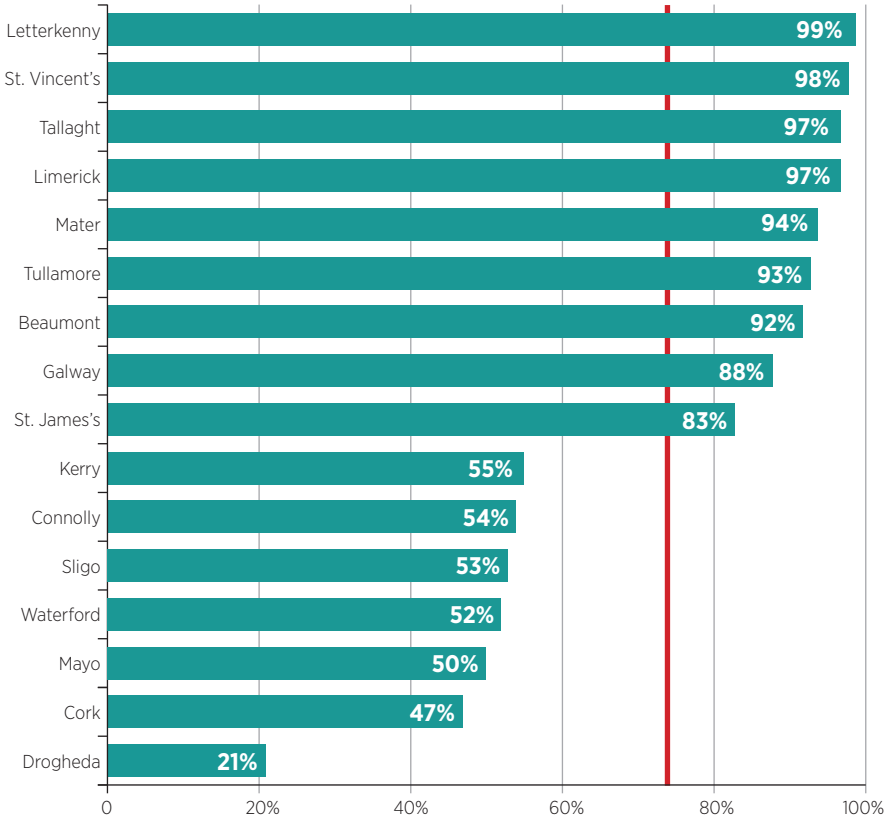


FIGURE 6 IHFS 5: PERCENTAGE OF PATIENTS RECEIVING A BONE HEALTH ASSESSMENT (n=3,320) [4, *]

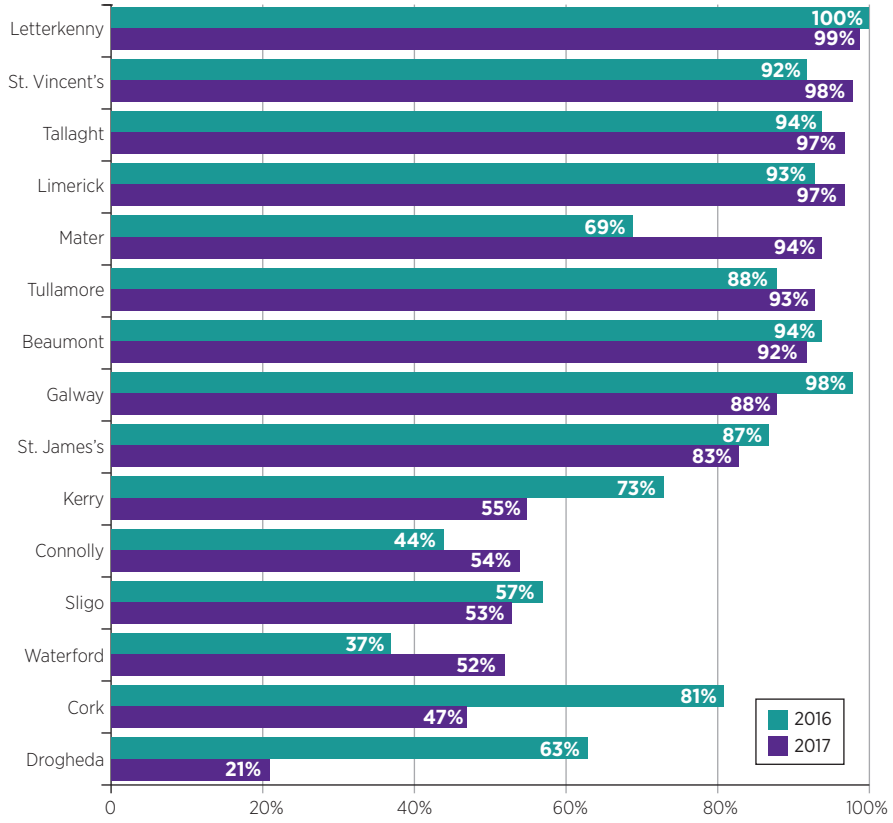
[4] 177 patients who died have been excluded from this analyses
[*] Please note: Percentages may not sum to 100% due to rounding.



The red line indicates the national average (mean).

FIGURE 6A IHFS 5: PERCENTAGE OF PATIENTS RECEIVING A BONE HEALTH ASSESSMENT, BY INDIVIDUAL HOSPITAL (n=3,320) [5, *]

[5] 177 patients who died have been excluded from this analyses
[*] Please note: Percentages may not sum to 100% due to rounding.



Mayo University Hospital was excluded from Figure 6B due to low coverage in 2016.

FIGURE 6B IHFS 5: PERCENTAGE OF PATIENTS RECEIVING A BONE HEALTH ASSESSMENT, BY INDIVIDUAL HOSPITAL PERFORMANCE, 2016 AND 2017*

* Please note: Percentages may not sum to 100% due to rounding.

LETTERKENNY UNIVERSITY HOSPITAL (LUH)

The Fracture Liaison Nurse (FLN) is responsible for assessing bone health in all patients presenting to the orthopaedic service at Letterkenny University Hospital (LUH). The FLN was appointed in 2008 with the aim of identifying patients who present to the orthopaedic service with risk factors for osteoporosis, and referring these patients on for Dual-Energy X-ray Absorptiometry (DXA) scanning.

The benefits of a fracture liaison service (FLS) were cited by McLellan et al. (2004) as being pivotal in the secondary prevention of osteoporotic fractures. The benefit of delegating the responsibility for bone health assessment to the FLN is that this prevents duplication of investigations and means that patients have a single point of contact for issues related to bone health. With regard to hip fracture patients, the FLN assesses these patients following admission and helps to coordinate their care during the acute phase of their admission. The FLN liaises with the orthopaedic and orthogeriatric services, which includes the input of data to the IHFD. The FLN also carries out the DXA scan for patients under the orthopaedic service and has access to the DXA scanner for 1.5 sessions per week. A copy of the scan report and a letter with recommendations for treatment are sent to the patient's general practitioner (GP). By being involved in the assessment and subsequent scanning of the patient, the FLN offers a seamless service for patients under the orthopaedic service. The FLN is also a point of contact for other members of the multidisciplinary team and acts as an advocate for bone health within the hospital.

There are several key elements needed to provide the FLS, which are:

1) Access to orthopaedic inpatients and outpatients
2) Support of the orthopaedic surgeons
3) Access to the DXA scanner
4) Involvement and engagement with local GPs
5) Linkage to and support from physicians with access to referral pathways for complex patients
6) Support of hospital management and funding for the FLN post, and
7) Support from ward and clinic-based staff, and from all members of the multidisciplinary team (MDT).

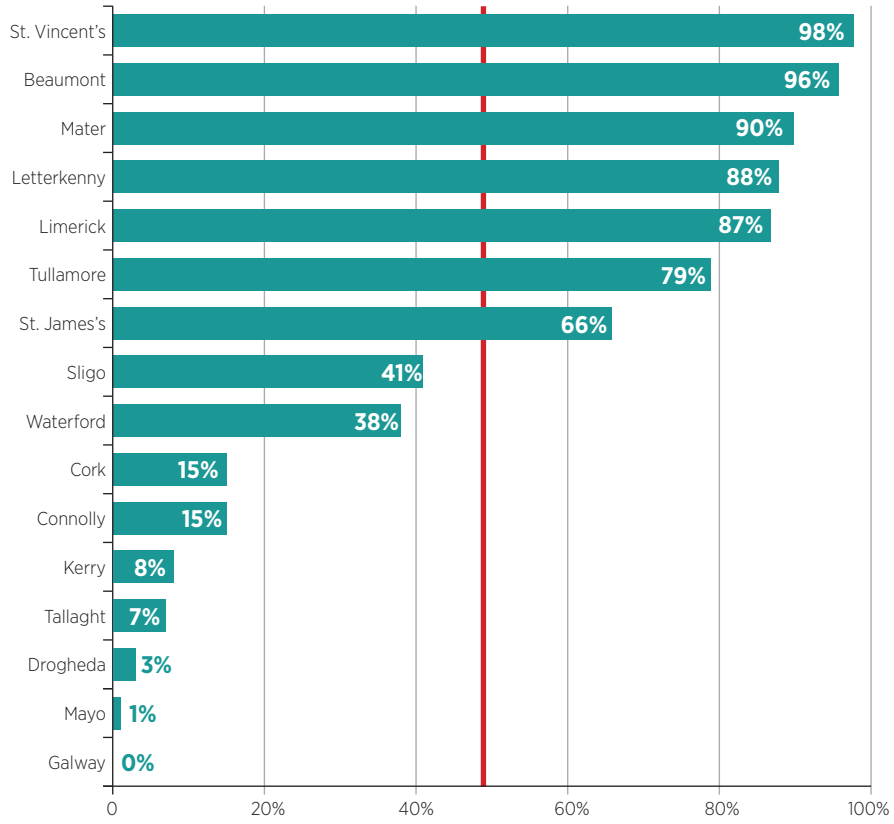
These elements ensure that the fracture liaison nurse is able to function within the orthopaedic service. At LUH, the service is now well-established and has helped to guarantee that all patients who present with a low-trauma fracture have their bone health assessed.

IHFS 6

IHFS 6: PERCENTAGE OF PATIENTS RECEIVING A SPECIALIST FALLS ASSESSMENT

47% of patients had a specialist falls assessment

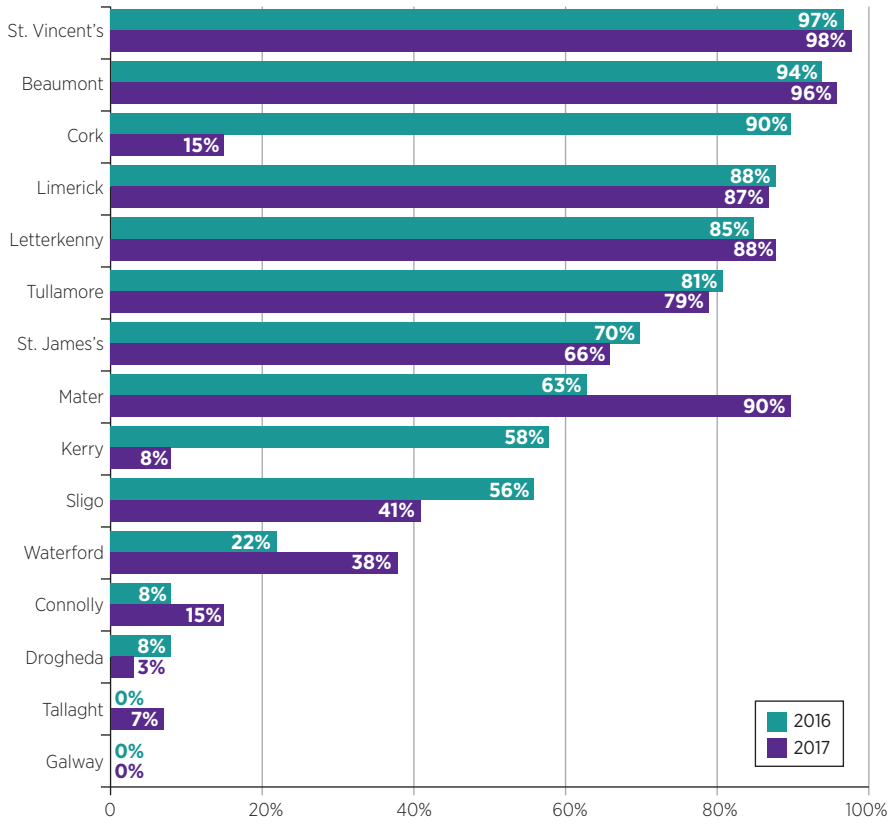
Prior to discharge, 47% (n=1,546) of patients nationally had a specialist falls assessment during their admission (Figure 7). A falls assessment should include a falls history (noting previous falls), cause of index fall (including medication review), and risk factors for falling and injury (including fracture). From this information, a plan of action to prevent further falls should be formulated (see Appendix 2). There continues to be variability in the level of service being provided in the 16 participating trauma hospitals, ranging from 0% to 98%. This is related to the level of Orthogeriatric services and Falls services in the varying hospitals (Figure 7). Figure 7A shows the comparison in individual hospital performance between 2016 and 2017.



The red line indicates the national average (mean).

FIGURE 7 IHFS 6: PERCENTAGE RECEIVING A SPECIALIST FALLS ASSESSMENT, BY INDIVIDUAL HOSPITAL (n=3,320) [6, *]

[6] 177 patients who died have been excluded from this analyses
[*] Please note: Percentages may not sum to 100% due to rounding.



Mayo University Hospital was excluded from Figure 7A due to low coverage in 2016.

FIGURE 7A IHFS 6: PERCENTAGE RECEIVING A SPECIALIST FALLS ASSESSMENT, BY INDIVIDUAL HOSPITAL PERFORMANCE, 2016 AND 2017*

* Please note: Percentages may not sum to 100% due to rounding.

UNIVERSITY HOSPITAL LIMERICK (UHL)

From left to right: Declan McNamara peri-operative director of nursing, Paula Lynch Orthopaedic CNS, Dr Jude Ryan Ortho-geriatrician, Lisa Gubbins CNM II Trauma Ward.

In July 2011, University Hospital Limerick (UHL) conducted a successful collaborative pilot of an orthogeriatric liaison service between the Geriatric and Orthopaedic Departments. All patients admitted with a fractured neck of femur were assessed in the perioperative period by a geriatrics research fellow with consultant geriatrician support. Patients received a geriatric assessment which included optimisation of medical condition, a bone health assessment, and a falls assessment. Patients were offered follow-up support in a dedicated fracture liaison secondary prevention clinic. All patients seen by the service for the one-year period beginning July 2011 were included in the intervention group. A comparative control group was selected from the IHFD and comprised of patients admitted to the same hospital with fractured neck of femur in the one-year period beginning July 2009.

The aim of the pilot was to show the cost-effectiveness of this service, and the impact on length of hospital stay, discharge destination and rehabilitation requirements was analysed. The results showed that the median length of stay was reduced by three days, saving a total of €266,976. There was a 19% reduction in rehabilitation requirements, saving €192,600 in total. Median rehabilitation length of stay was reduced by 6.5 days, saving €171,093 in total. The reductions in long-term care requirements led to savings of €10,934 per week. Costs to establish such a service amounted to €171,564, demonstrating that the introduction of this service led to improved patient outcomes in a cost-effective manner.

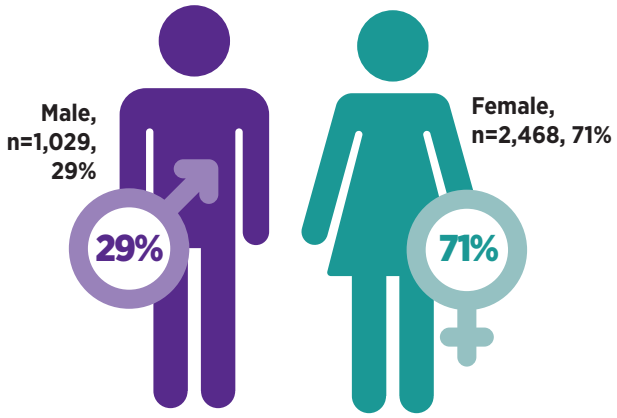
Following on from this work, the orthogeriatric liaison team was able to demonstrate to hospital management the benefits of resourcing this service long term. Now, the service consists of a full-time geriatric registrar who sees the hip fracture patients daily for medical optimisation, in addition to twice weekly consultant-led rounds with the orthopaedic interns, orthogeriatric registrar, an orthopaedic nurse specialist, and a physiotherapist. Liaison with the trauma list anaesthetist aims to reduce cancellations and perioperative complications, and all patients are offered falls and bone health assessments and an outpatient review. Maintenance of a prospective database facilitates ongoing research within the team. Current challenges include physiotherapy recruitment and retention, as well as timely access to rehabilitation beds.

CHAPTER 5
CASE MIX

CHAPTER 5: **CASE MIX**

GENDER AND AGE GROUP

Of the 3,497 hip fracture cases recorded in 2017, 71% (n=2,468) were female and 29% (n=1,029) were male. When examining the age breakdown of male and female patients, the gap becomes even more evident in those aged 90 years and over: almost 80% (n=402) of this cohort was female (Figure 8). The average age for hip fracture patients is 80.



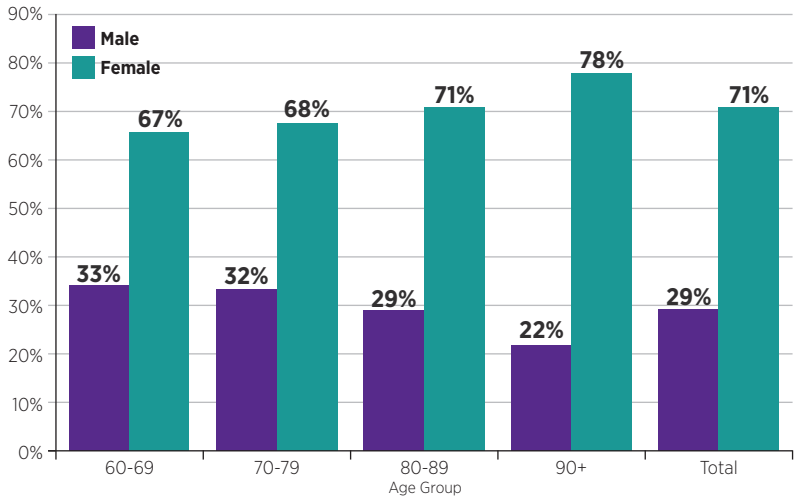


FIGURE 8: PERCENTAGE OF PATIENTS BY GENDER AND AGE GROUP (N=3,497)*

* Please note: Percentages may not sum to 100% due to rounding.

SOURCE OF ADMISSION

The home continues to be the most common source of admission (82%, n=2,859) (Figure 9). Ten percent (n=354) of patients were admitted from a nursing home or other long-stay facility and an additional 8% (n=261) were transferred from another acute hospital/HIPE-reporting hospital. However, this pattern changes as people get older; 20% (n=101) of patients aged 90 years and over were admitted from a nursing home or other long-stay facility.

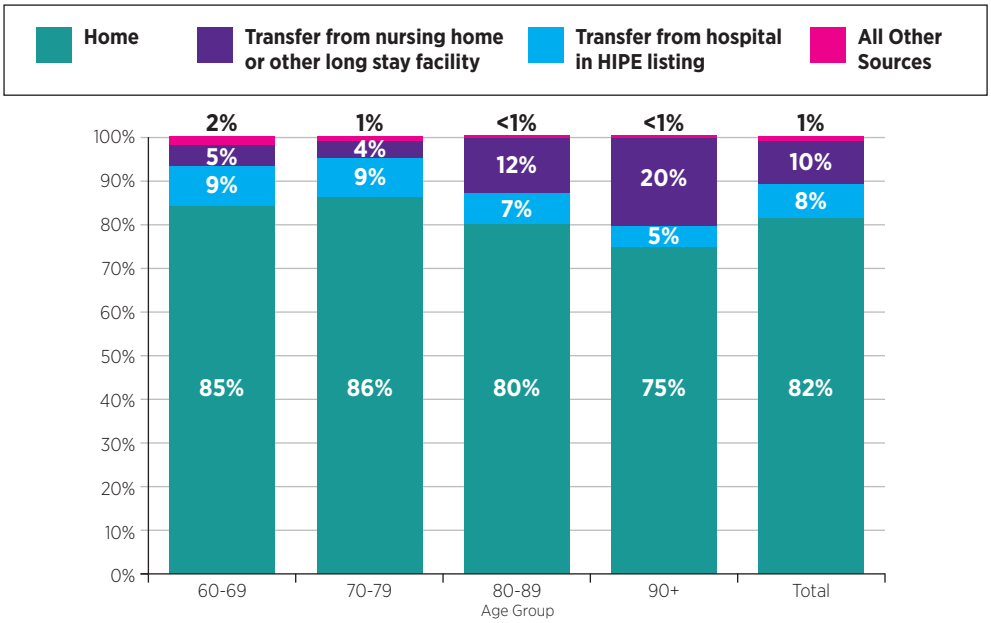


FIGURE 9: PERCENTAGE OF PATIENTS BY AGE GROUP AND SOURCE OF ADMISSION TO HOSPITAL (N=3,497)*

* Please note: Percentages may not sum to 100% due to rounding.

ABBREVIATED MENTAL TEST SCORE

An Abbreviated Mental Test (AMT) Score by Hodkinson (1972) was recorded in just 8% (n=276) of hip fracture cases; this represents a 5% decrease from 2016 and continues to show that the deficit of known AMT Scores is a reflection of this test not being conducted as opposed to data not being recorded. Due to the lack of data available for this field, a pilot of a 4AT – a rapid clinical test for delirium (Bellelli *et al.,* 2014) – is being conducted to see if the data quality improves and could therefore replace the current data field. Of those cases recorded, 68% (n=189) had scores of 7 to 10 inclusive, i.e. they were not likely to have cognitive impairment (Figure 10).

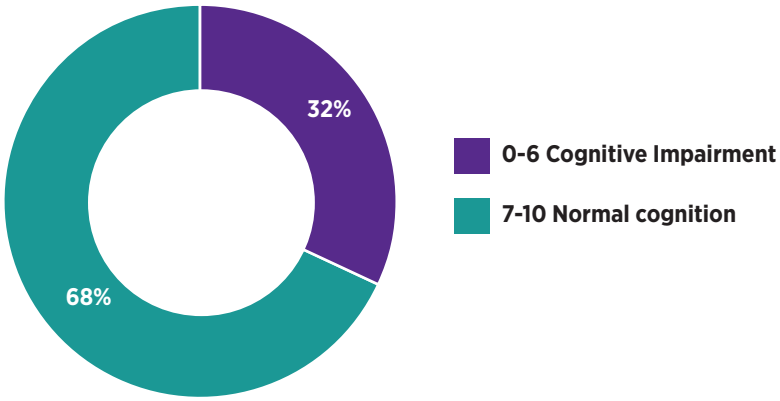


FIGURE 10: LEVEL OF COGNITION OF PATIENTS WITH A RECORDED AMT SCORE (n=276)*

* Please note: Percentages may not sum to 100% due to rounding.

AMERICAN SOCIETY OF ANESTHESIOLOGISTS GRADE

The American Society of Anesthesiologists (ASA) grades (Dripps, 1963) were recorded for 89% (n=3,105) of patients. The highest proportion of cases were graded as ASA Grade 3 – Severe (52%, n=1,618) and Grade 2 – Mild (38%, n=1,191). Grade 4 cases accounted for just 7% (n=216) of hip fracture cases (Figure 11). The ASA classification of 'E' for Emergency is not specifically mentioned, but it is assumed for all hip fractures recorded in the IHFD. The data shows that as patients get older, their ASA grades increase in severity. For example, 34% (n=152) of patients aged 60 to 69 years were assigned an ASA grade of 3, whereas almost 60% (n=270) of patients aged 90 years and over were assigned an ASA grade of 3 (Figure 11).

TABLE 4: AMERICAN SOCIETY OF ANAESTHESIOLOGISTS 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.

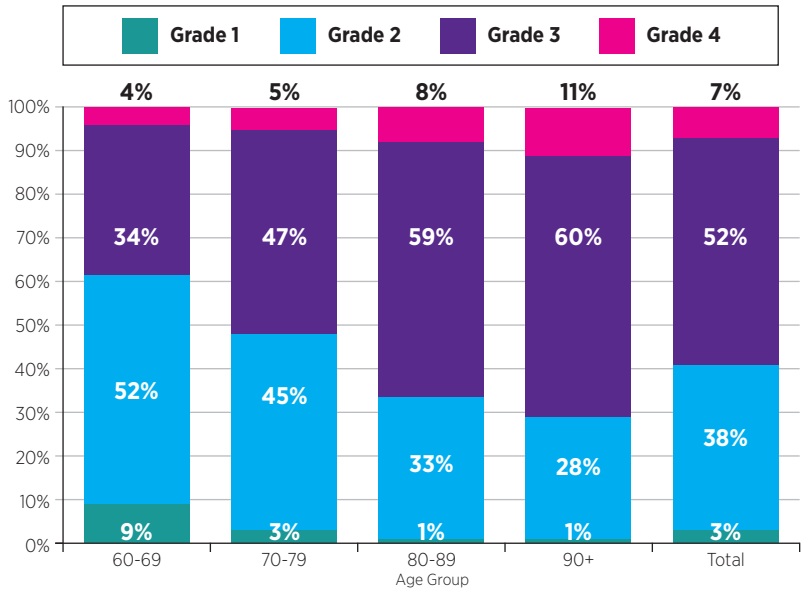


FIGURE 11: ASA GRADE FOR PATIENTS WITH A RECORDED SCORE BY AGE GROUP (n=3,105)*

* Please note: Percentages may not sum to 100% due to rounding.

PRE-FRACTURE MOBILITY, NEW MOBILITY SCORE (NMS)

The NMS was introduced to the IHFD in 2016. This is a validated, self-reported measure used to quantify baseline mobility across three functional activities: indoor walking, outdoor walking, and shopping (Table 5) (Parker and Palmer, 1993; Kristensen *et al.,* 2008; Kristensen *et al.,* 2010). Forty-seven percent (n=1,404) of patients were documented as having high function pre-fracture (NMS 7–9) and 53% (n=1,575) had low functional mobility pre-fracture (NMS 0–6). When NMS is compared by age group, it shows that as age increases, the level of high functional mobility decreases (Figure 12). Further details regarding the different levels of function – defined by NMS as indoor walking, outdoor walking, and shopping – are provided in Figure 12A.

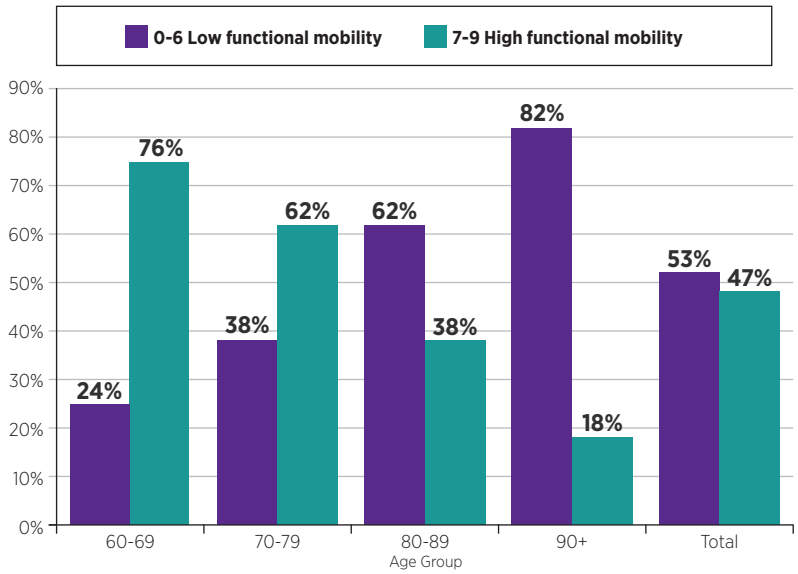
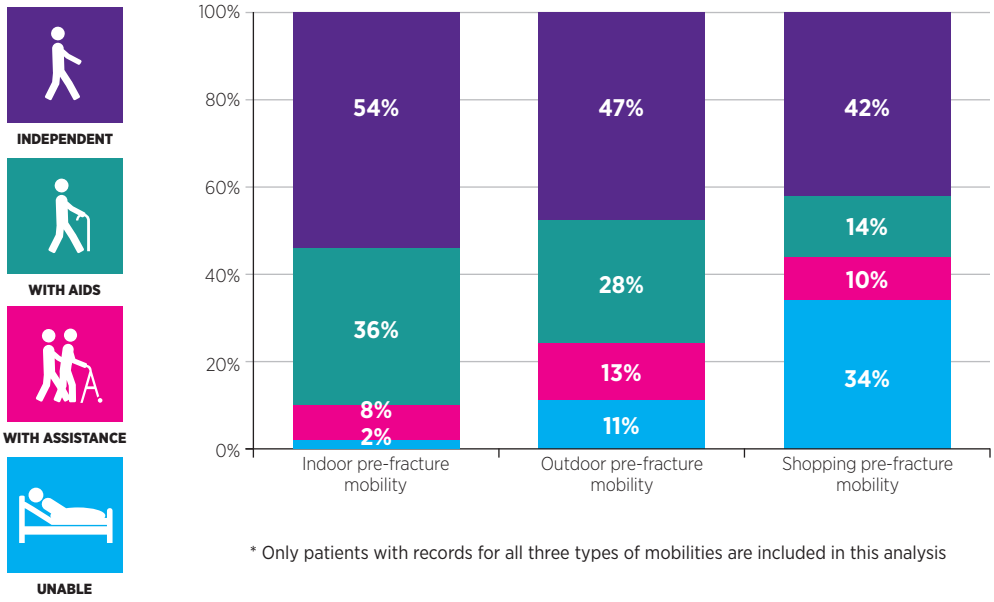


FIGURE 12: PRE-FRACTURE LEVEL OF MOBILITY FOR PATIENTS RECORDED WITH A TOTAL NMS BY AGE GROUP (n=2,979)*

* 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

FIGURE 12A: PRE-FRACTURE LEVEL OF MOBILITY WITHIN THREE FUNCTIONAL ACTIVITIES (NMS) (n= 2,979)*

TABLE 5: 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. **Example:** 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	

* Please note: Percentages may not sum to 100% due to rounding.

TYPE OF FRACTURE

The most common types of fractures recorded continue to be intracapsular (displaced) fractures (41%, n=1,417) and intertrochanteric fractures (36%, n=1,259) (Figure 13, Figure 13A). The type of fracture was recorded as 'not documented' in 2% (n=76) of cases, which signifies a further improvement in data quality for this field.

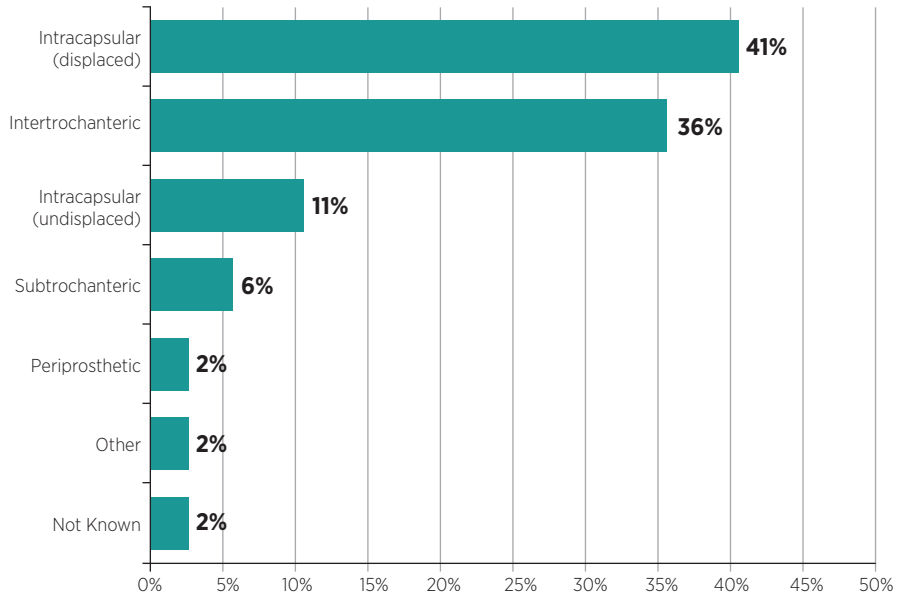


FIGURE 13: PERCENTAGE OF PATIENTS WITH EACH TYPE OF FRACTURE (N=3,497)*

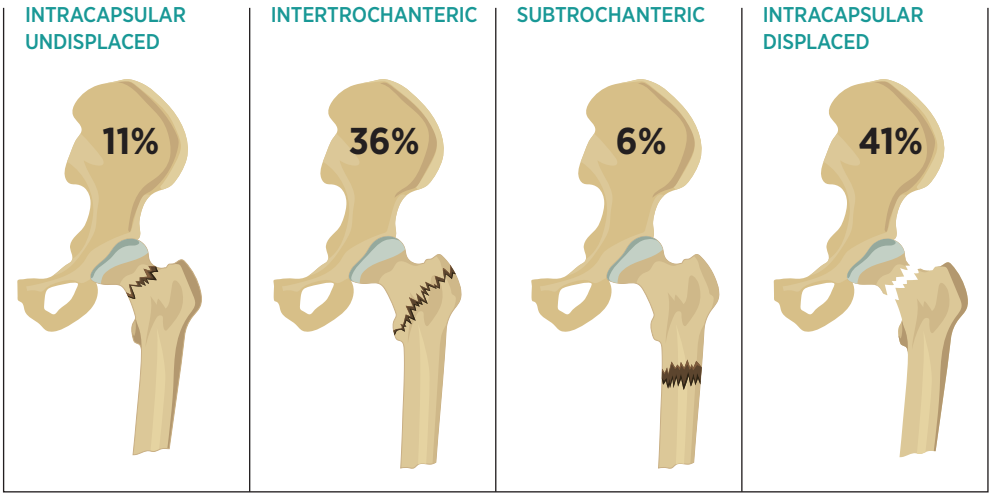


FIGURE 13A: PERCENTAGE OF PATIENTS WITH EACH TYPE OF FRACTURE INTRACAPSULAR UNDISPLACED, INTRACAPSULAR DISPLACED, INTERTROCHANTERIC, SUBTROCHANTERIC (N=3,323)*

* Please note: Percentages may not sum to 100% due to rounding.

CHAPTER 6
PATIENT PATHWAY

CHAPTER 6: **PATIENT PATHWAY**

MODE OF ADMISSION TO HOSPITAL

Figure 14 shows that 92% (n=3,217) of patients presented directly to an ED in an operating hospital, indicating that there has been steady improvement in this pathway with an increase of 5% since 2016. This is a direct result of the introduction of hip fracture bypass by the National Trauma and Orthopaedic Clinical Programme in conjunction with the HSE Acute Hospitals Division and the National Ambulance Service. A further 8% (n=261) of patients were transferred from an ED in a non-operating hospital to a ward in an operating hospital and were seen by the orthopaedic team. Less than 1% of patients experienced a transfer from one ED to a second ED.

92% of patients presented directly to an ED in an operating hospital – a 5% increase since 2016

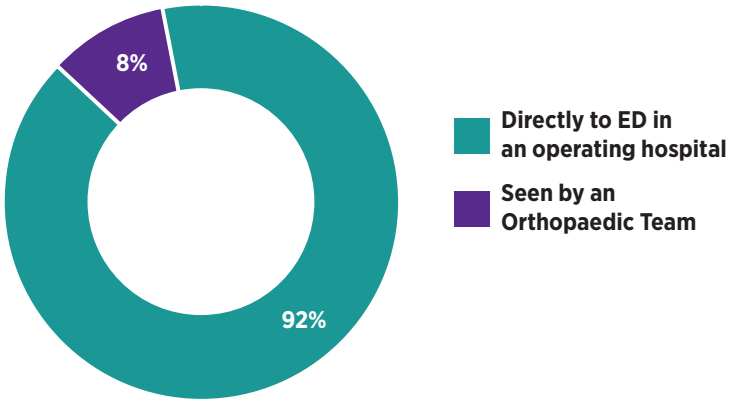
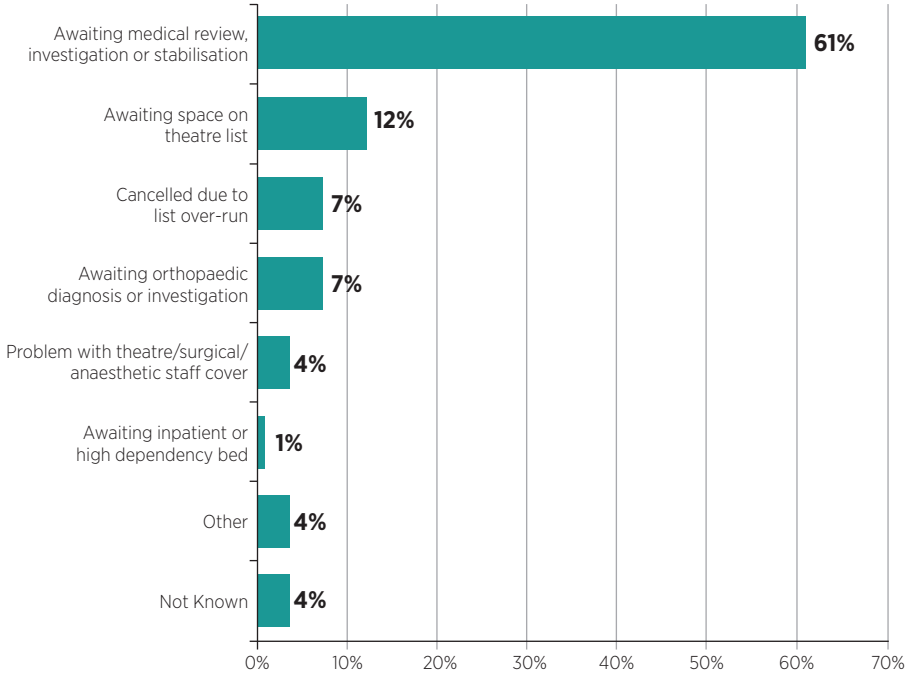


FIGURE 14: MODE OF ADMISSION TO OPERATING HOSPITAL (N=3,497)*

* Please note: Percentages may not sum to 100% due to rounding.

REASON FOR DELAY IF SURGERY AFTER 48 HOURS

Almost 30% (n=946) of patients received surgery after 48 hours of their admission to hospital. For a large number of cases (n=154, 16%), no reason has been given for their delay to surgery (this is mostly likely due to a change in the data entry portal which has been addressed). For the 792 patients who have a recorded reason for delay; awaiting medical review, investigation, and stabilisation (61%, n=483) is the most common reason. To further evaluate the exact medical reason for delay to surgery, a new data field was included in the IHFD dataset in 2018 to capture further detail. This data will be published in the IHFD 2018 report. Awaiting space on the theatre list (12%, n=93) and the surgery being cancelled due to list over-run (7%, n=59) also accounted for a proportion of the delays (Figure 15).



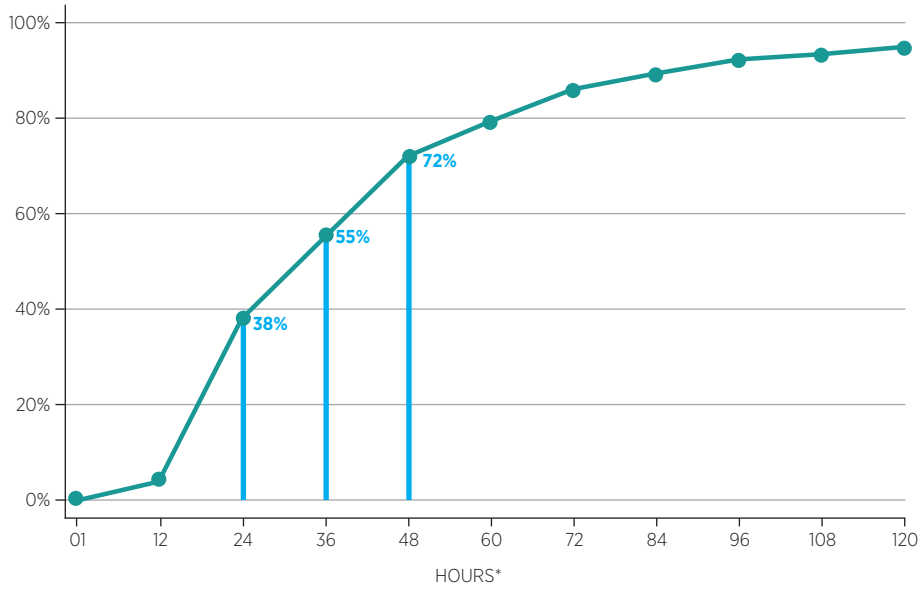
Other includes 'Awaiting inpatient or high dependency bed' and 'Problem with theatre/surgical/anaesthetic staff cover'.

FIGURE 15: PERCENTAGE OF PATIENTS BY REASON FOR DELAY TO SURGERY AFTER 48 HOURS (n=792)[7,*]

[7] No reason for delay has been recorded for 154 cases
[*] Please note: Percentages may not sum to 100% due to rounding.

CUMULATIVE TIME TO SURGERY

Figure 16 shows that 38% (n=1,245) of patients received their surgery within 24 hours, 55% (n=1,825) within 36 hours, and 72% (n=2,379) within 48 hours of presentation. This remains virtually unchanged from the 2016 report.



*Includes cases with valid time records only.

FIGURE 16: CUMULATIVE TIME TO SURGERY (N=3,323)*

* Please note: Percentages may not sum to 100% due to rounding.

TYPE OF ANAESTHESIA

Spinal anaesthetic (SA) continues to be the predominant type of anaesthesia used (53%, n=1,783) (Figure 17). It is also used in combination with general anaesthetic (GA) (2%, n=82) or, increasingly, with a nerve block (22%, n=740).

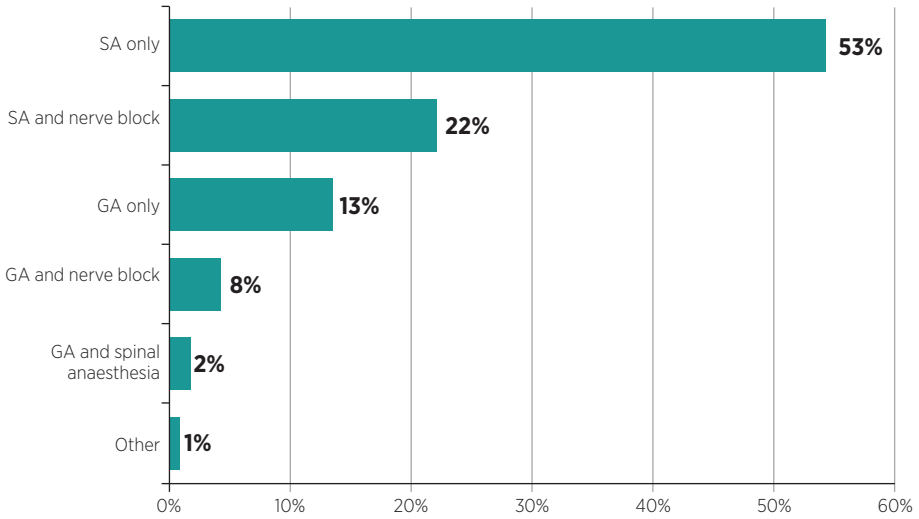


FIGURE 17: PERCENTAGE OF PATIENTS BY TYPE OF ANAESTHESIA (n=3,320)*

* Please note: Percentages may not sum to 100% due to rounding.

TYPE OF SURGERY

Thirty-five percent (n=1,162) of patients underwent a cemented hemiarthroplasty and 21% (n=704) underwent internal fixation by dynamic hip screw (DHS) (Figure 18). Table 6 details the fixation of fractures by fracture type. Ninety-six percent (n=1,329) of patients with an intracapsular fracture (displaced) underwent either a hemiarthroplasty or a total hip replacement (THR), whereas 68% (n=241) of patients with an intracapsular fracture (undisplaced) underwent either a hemiarthroplasty or a THR. Ninety-four percent (n=1,163) of patients with an intertrochanteric fracture underwent internal fixation. Ninety percent (n=184) of patients with a subtrochanteric fracture underwent internal fixation, and 3% (n=6) underwent a hemiarthroplasty; these cases should be identified locally and reviewed.

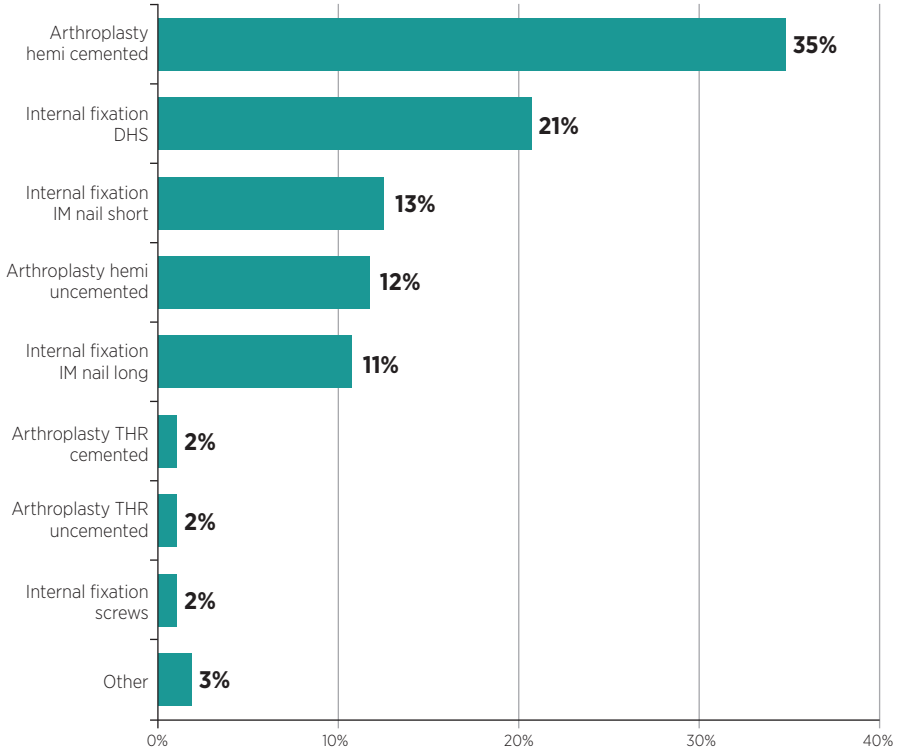


FIGURE 18: PERCENTAGE OF PATIENTS BY TYPE OF SURGERY (n=3,336)*

* Please note: Percentages may not sum to 100% due to rounding.

TABLE 6: TYPE OF SURGERY BY FRACTURE TYPE PERCENTAGES

	Intracapsular (displaced)	Intracapsular (undisplaced)	Intertrochanteric	Subtrochanteric
No operation recorded	0%	0%	0%	0%
Internal fixation DHS	3%	20%	45%	5%
Internal fixation screws	1%	9%	1%	2%
Internal fixation IM nail (long)	0%	0%	16%	69%
Internal fixation IM nail (short)	0%	2%	32%	14%
Arthroplasty hemi cemented	64%	51%	4%	3%
Arthroplasty hemi uncemented	24%	12%	1%	0%
Arthroplasty THR (cemented)	4%	3%	0%	0%
Arthroplasty THR (uncemented)	4%	2%	0%	0%
Other	0%	1%	1%	7%

National Institute for Health and Care Excellence Clinical Guideline 124 (2011) recommends the use of cemented implants in patients undergoing arthroplasty. Seventy-three percent of arthroplasties reported in 2017 were cemented (n=1,232), an increase of 3% from 2016 (Figure 19).

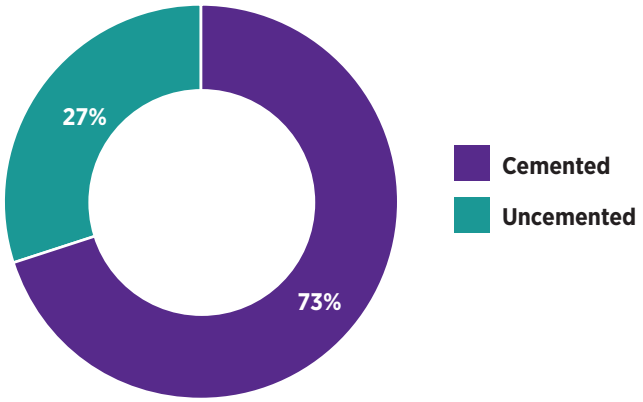


FIGURE 19: PERCENTAGE OF PATIENTS WITH CEMENTED AND UNCEMENTED ARTHROPLASTIES (n=1,694)*

* Please note: Percentages may not sum to 100% due to rounding.

MOBILISATION: DAY OF OR DAY AFTER SURGERY AND MOBILISED BY

Early mobilisation of hip fracture patients is a key measure of the standard of care and is directly linked to better outcomes (Hirose et al., 2010; Dubljanin-Raspopović *et al.,* 2013). Figure 20 shows that 77% of patients were mobilised on the day of or the day after surgery: 73% (n=2,438) of patients were mobilised by a physiotherapist and 4% (n=143) were mobilised by someone else ('other'). However, one in five patients were not mobilised on the day of or the day after surgery. Hospitals should review their data locally to determine the reasons for this. The facilities audit carried out in 2016 demonstrated that there was no weekend physiotherapy service in almost 50% of hospitals. Hospitals should review their service resources to ensure that hip fracture patients have routine access to physiotherapy every day of the week.

77% of patients were mobilised on the day of or day after surgery

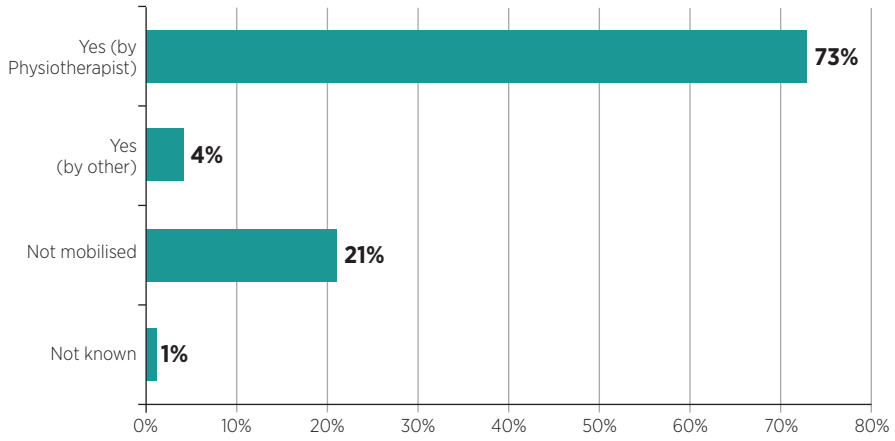


FIGURE 20: PERCENTAGE OF PATIENTS BY MOBILISATION: DAY OF OR DAY AFTER SURGERY AND MOBILISED BY (n=3,336)*

* Please note: Percentages may not sum to 100% due to rounding.

CHAPTER 7

OUTCOMES

CHAPTER 7: **OUTCOMES**

FUNCTIONAL OUTCOMES: CUMULATIVE AMBULATORY SCORE (CAS)

Functional outcomes, measured by the Cumulative Ambulatory Score (CAS), act as an indicator of postoperative outcomes. This measure was introduced to the IHFD in 2016 as a validated measure for hip fracture patients (Kristensen *et al.,* 2009; Kristensen et al., 2012). As seen in the 2016 report, there continues to be a high proportion of missing data for this field. Data for the first postoperative day were missing for 50% (n=1,662) of patients (an improvement of 9% from 2016). Sixty-one percent (n=2,033) of data was missing for the day of discharge, which represents an improvement of 16% from 2016. While the data quality is improving for this score, significant improvement is still required. For the analysis of this variable, only patients with a valid score for both variables were included (n=1,202).

Figure 21 shows that 18% (n=216) of patients with CAS data recorded, achieved independent mobility (CAS=6) by the day on which they were discharged from the acute hospital.

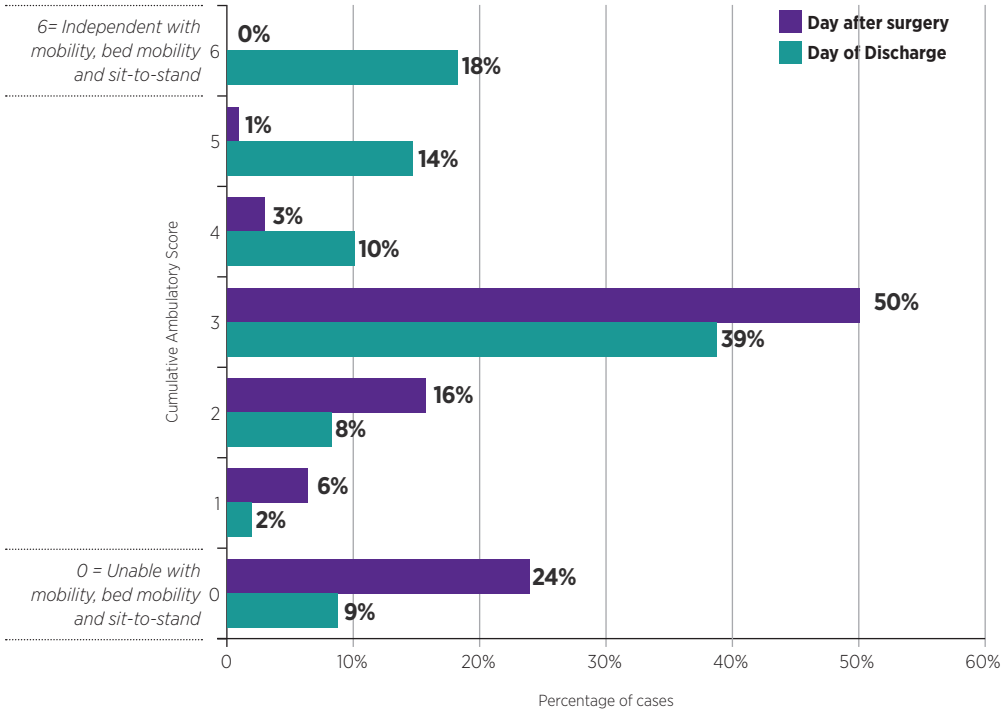


FIGURE 21: PERCENTAGE OF PATIENTS BY FUNCTIONAL OUTCOMES: CUMULATIVE AMBULATORY SCORE (CAS) (N=1,202)*

* Please note: Percentages may not sum to 100% due to rounding.

DESTINATION ON DISCHARGE

Figure 22 shows that 22% (n=760) of patients were discharged directly home from hospital; a further 33% (n=1,147) required rehabilitation either at an on-site or off-site facility. Six percent (n=210) of patients were recorded as new admissions to a nursing home or long-stay care facility. In Chapter 8, the patients who were discharged directly home will be further analysed to determine if there were any identifiable reasons that could indicate why they may have gone home directly.

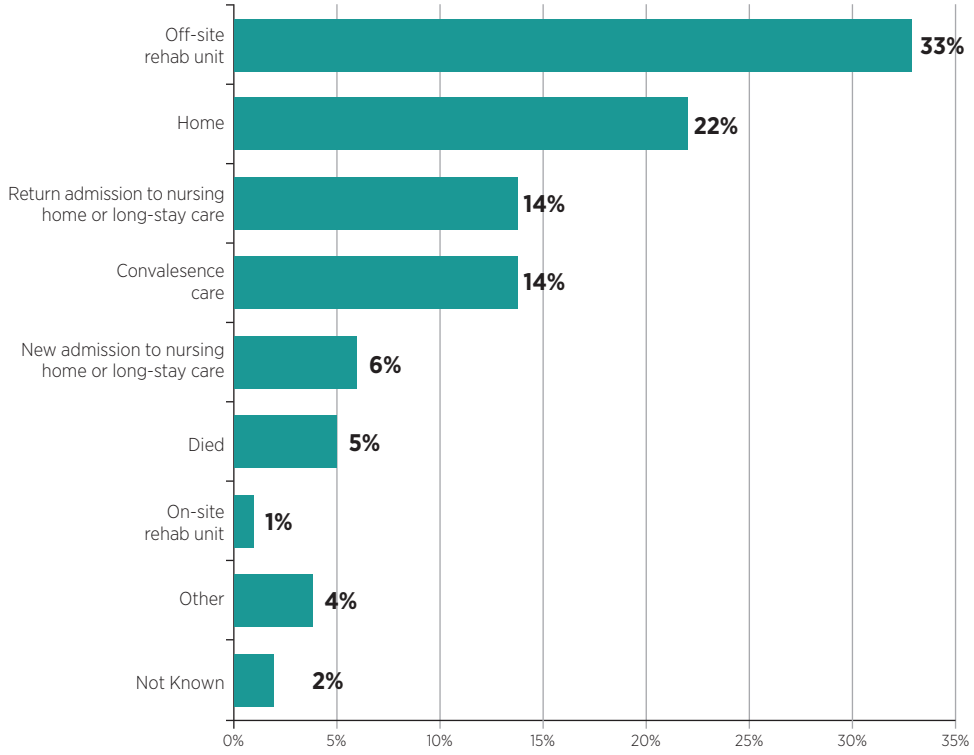


FIGURE 22: PERCENTAGE OF PATIENTS BY DESTINATION ON DISCHARGE (N=3,497)*

* Please note: Percentages may not sum to 100% due to rounding.

CUMULATIVE LENGTH OF STAY (LOS)

Cumulative length of stay is measured on the HIPE system 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 23 shows the cumulative percentages for all lengths of stay; 23% of patients were discharged within a week, and 57% within a fortnight. The mean and median lengths of stay for hip fracture patients were 20 and 13 days, respectively.

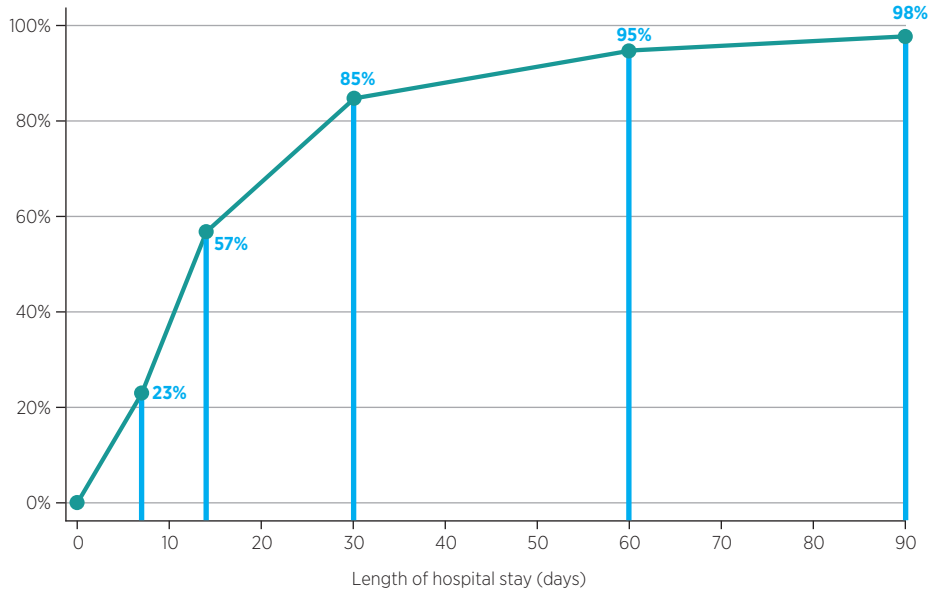


FIGURE 23: PERCENTAGE OF PATIENTS BY CUMULATIVE LENGTH OF STAY (LOS) (N3,497)*

* Please note: Percentages may not sum to 100% due to rounding.

RE-OPERATION WITHIN 30 DAYS

In 2017, there was a large increase in the percentage of 'unknowns' recorded in this field, which will need to be further reviewed. Patients are often discharged before 30 days, and therefore it may not be known if the patient returned to another hospital for surgery. Figure 24 shows that 85% (n=2,845) of patients did not undergo re-operation within 30 days.

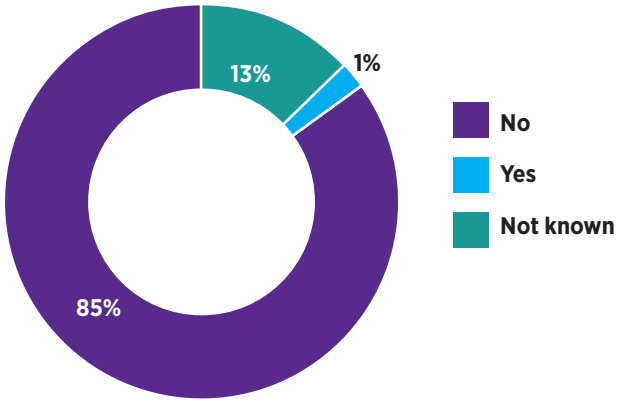
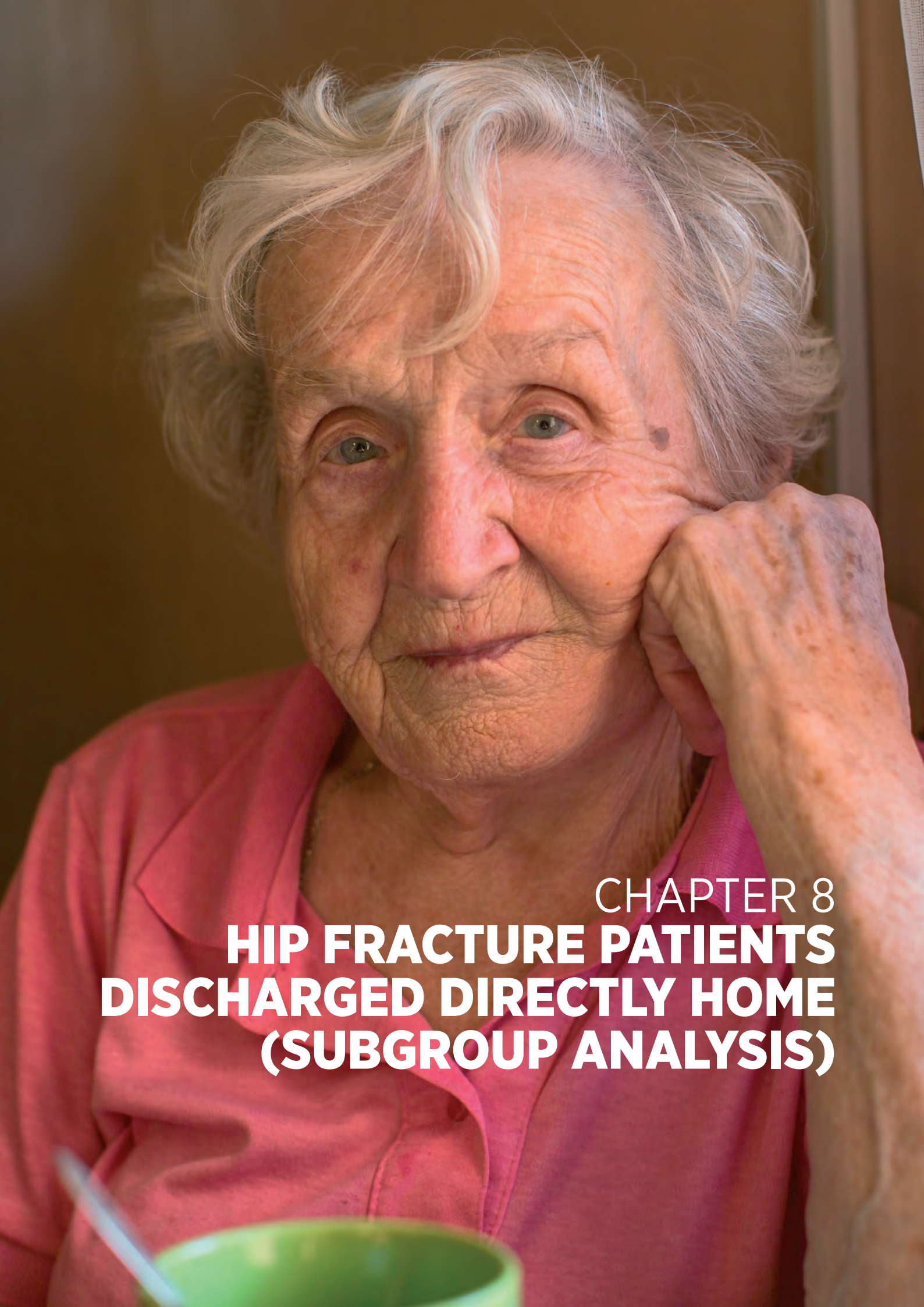


FIGURE 24: PERCENTAGE OF PATIENTS BY RE-OPERATION WITHIN 30 DAYS (n=3,336)*

* Please note: Percentages may not sum to 100% due to rounding.



CHAPTER 8

HIP FRACTURE PATIENTS DISCHARGED DIRECTLY HOME (SUBGROUP ANALYSIS)

CHAPTER 8: HIP FRACTURE PATIENTS DISCHARGED DIRECTLY HOME (SUBGROUP ANALYSIS)

The theme for this report is 'from broken bone to walking home' and for that reason a focus on the group of hip fracture patients who go directly home from the acute hospital will be further explored to determine what characteristics may be influencing this. Just over one in five or 22% (n=760) of hip fracture patients were discharged directly home from the hospital (Figure 25).

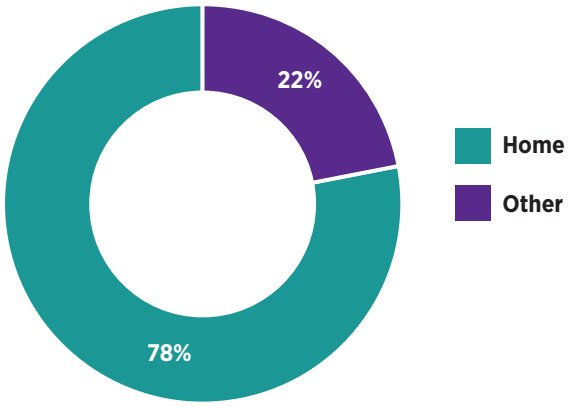


FIGURE 25: PERCENTAGE OF PATIENTS DISCHARGED DIRECTLY HOME (N=3.497)*

GENDER AND AGE GROUP

The age and gender of patients discharged directly home shows that there tends to be a slight trend towards more females being discharged as age increases compared to males (Figure 26). The average age of hip fracture patients discharged directly home is 75 and for hip fracture patients with discharge destination 'Other', the average age is 82.

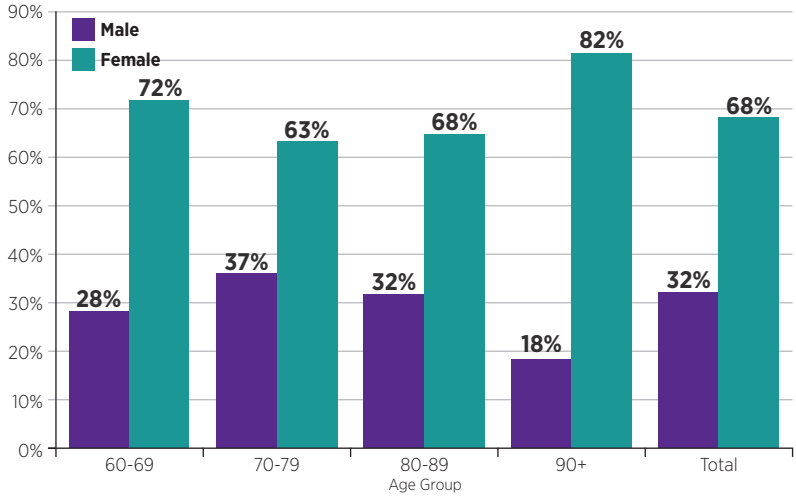


FIGURE 26: PERCENTAGE OF PATIENTS DISCHARGED DIRECTLY HOME BY GENDER AND AGE GROUP (n=760)*

* Please note: Percentages may not sum to 100% due to rounding.

SOURCE OF ADMISSION VERSUS DISCHARGE DESTINATION

Of the 22% (n=760) patients who were discharged directly home, 92% were admitted from home (Figure 27).

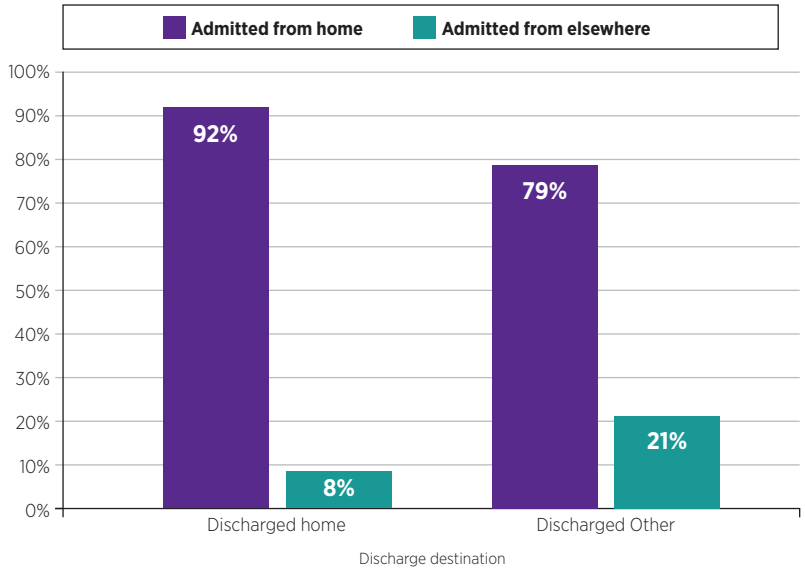


FIGURE 27: PERCENTAGE OF PATIENTS ADMITTED FROM HOME BY DISCHARGE DESTINATION (n=3,497)*

AMERICAN SOCIETY OF ANESTHESIOLOGISTS (ASA) GRADE

ASA Grade may be a significant factor for identifying patients who could go home directly from hospital

Figure 28 shows that the group of patients discharged directly home from hospital have lower ASA grade scores across almost all grades compared to those discharged elsewhere. The graph shows that 39% (n=254) of the discharged home group were ASA Grade 3- Severe compared to 56% (n=1,364) of the those discharged elsewhere. ASA Grade may be a significant factor for identifying patients who could go home directly from hospital.

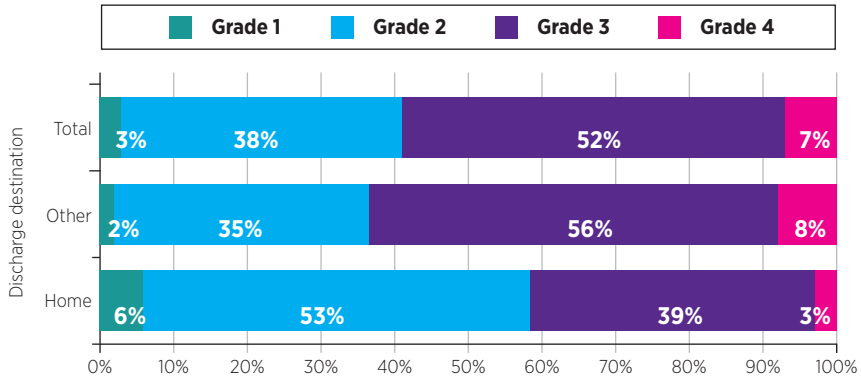


FIGURE 28: PERCENTAGE OF PATIENTS BY ASA GRADE AND DISCHARGE DESTINATION (n=3,105)*

* Please note: Percentages may not sum to 100% due to rounding.

PRE-FRACTURE MOBILITY

Figure 29 shows that the group of patients discharged directly home have a higher functional level recorded pre-fracture, compared to those discharged elsewhere. In the discharged directly home group, 73% (n=463) were recorded as having high functional mobility pre-fracture, compared to 40% (n=941) for those discharged elsewhere. Pre-fracture functional level may play a significant role in determining if patients will be discharged directly home. Potentially these patients could be identified at admission for accelerated discharge. There appears to be a higher proportion of patients deemed independently mobile across the specific functional activities (NMS): indoor walking, outdoor walking and shopping, in the discharge destination home group versus the discharge destination 'other' group (Figure 29A).

Pre-fracture functional level may play a significant role in determining if patients will be discharged directly home

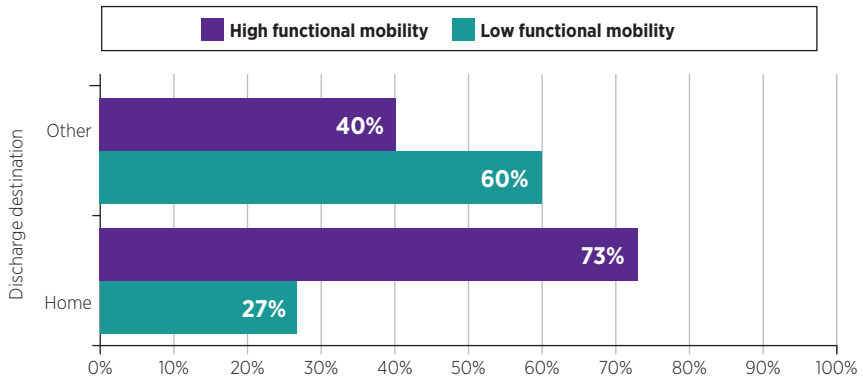


FIGURE 29: PRE-FRACTURE LEVEL OF MOBILITY BY DISCHARGE DESTINATION (n=2,979)*

* Please note: Percentages may not sum to 100% due to rounding.

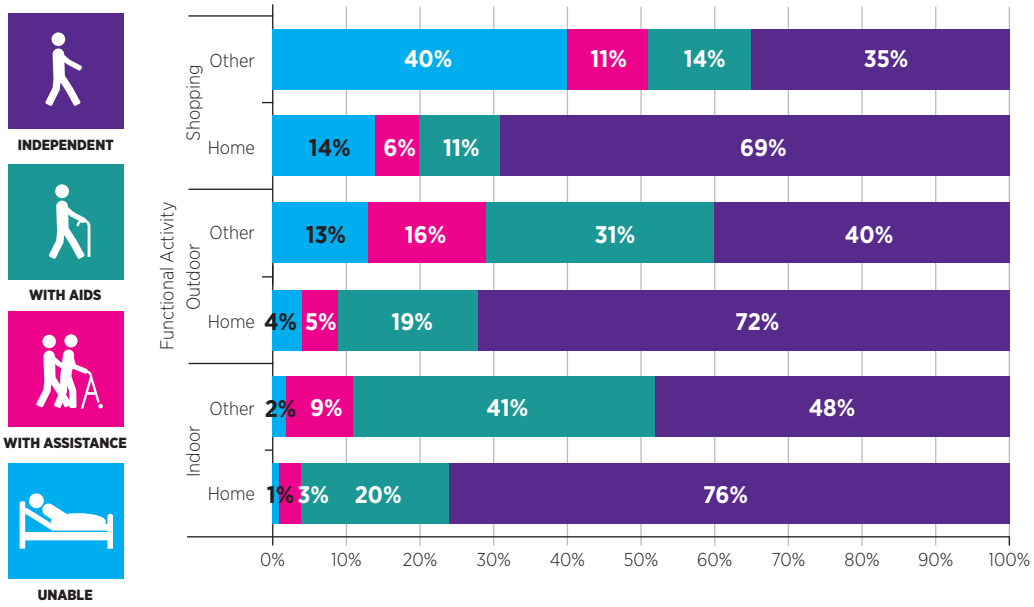


FIGURE 29A: PRE-FRACTURE LEVEL OF MOBILITY BY DISCHARGE DESTINATION, OTHER WITHIN THREE FUNCTIONAL ACTIVITIES (NMS): INDOOR WALKING, OUTDOOR WALKING, SHOPPING (n=2,979)*

* Please note: Percentages may not sum to 100% due to rounding.

TYPE OF FRACTURE

There are similar distributions in fracture type between the patients who were discharged home and those who were discharged elsewhere (Figure 30). This indicates that fracture type is unlikely to be significant for identifying patients who can go home directly.

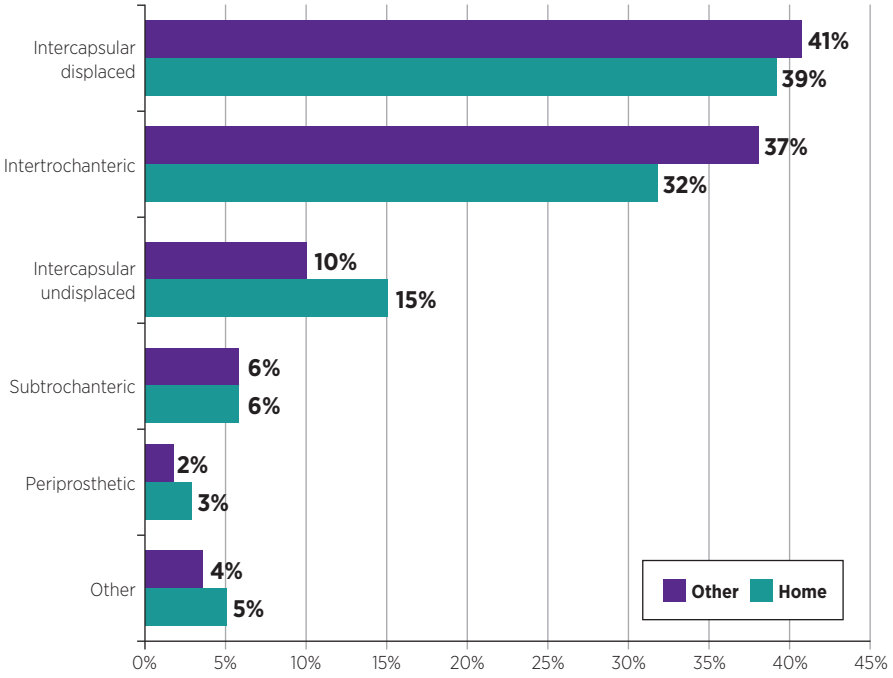


FIGURE 30: PERCENTAGE OF FRACTURE TYPE BY DISCHARGE DESTINATION (N=3,497)*

* Please note: Percentages may not sum to 100% due to rounding.

IRISH HIP FRACTURE STANDARDS (IHFS) BY DISCHARGE DESTINATION HOME OR OTHER

IHFS 1: – percentage of patients admitted to an orthopaedic ward within fours hours of first presentation or direct to theatre from ED within 4 hours

A slightly higher proportion of patients who were discharged directly home (14%, n=106) met standard one compared to hip fracture patients discharged elsewhere (n=283) (Figure 31).

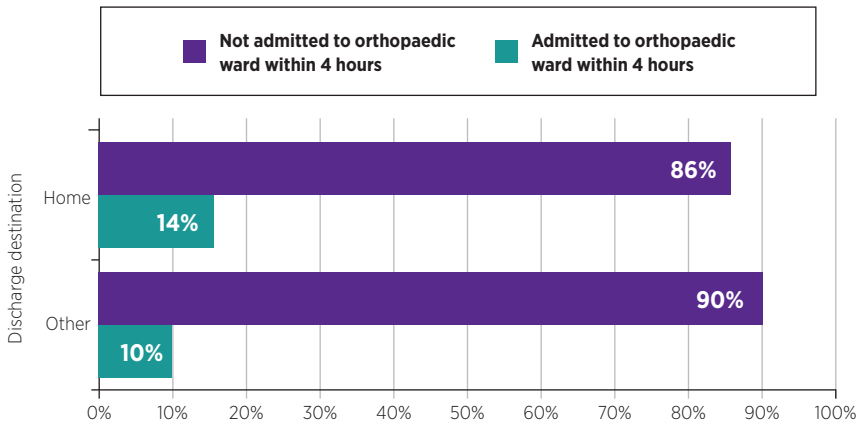


FIGURE 31 IHFS 1: HIP FRACTURE STANDARD 1 PERCENTAGE ADMITTED TO ORTHOPAEDIC WARD WITHIN 4 HOURS (INCLUDING PATIENTS THAT GO STRAIGHT TO THEATRE FROM ED) BY DISCHARGE DESTINATION (N=3,497)*

Earlier surgery improves the patient's ability to get home directly from hospital

IHFS 2: – percentage of patients receiving surgery within 48 hours of first presentation (and within normal working hours)

There is a 10% difference in the proportion of patients in the two discharge groups receiving their surgery within 48 hours as per IHFS 2. Seventy-seven percent (77%, n=554) of patients who were discharged directly home received their surgery within 48 hours compared to 67% (n=1,764) of patients who were discharged elsewhere. This shows that earlier surgery improves the patient's ability to get home directly from hospital (Figure 32).

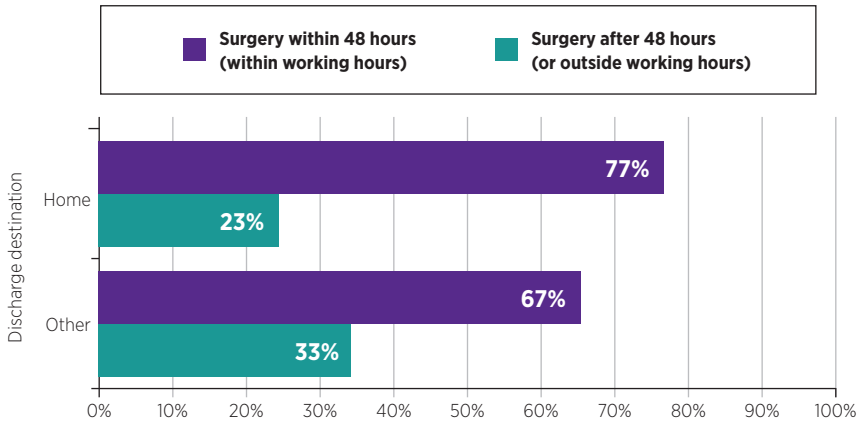


FIGURE 32 IHFS 2: HIP FRACTURE STANDARD 2 PERCENTAGE RECEIVING SURGERY WITHIN 48 HOURS (AND WITHIN NORMAL WORKING HOURS) BY DISCHARGE DESTINATION (n=3,336)*

* Please note: Percentages may not sum to 100% due to rounding.

IHFS 3 – percentage of patients developing a pressure ulcer following admission
Figure 33 shows that 2% (n=12) of hip fracture patients discharged directly home developed pressure ulcers, compared with 3% (n=85) of patients who were discharged elsewhere.

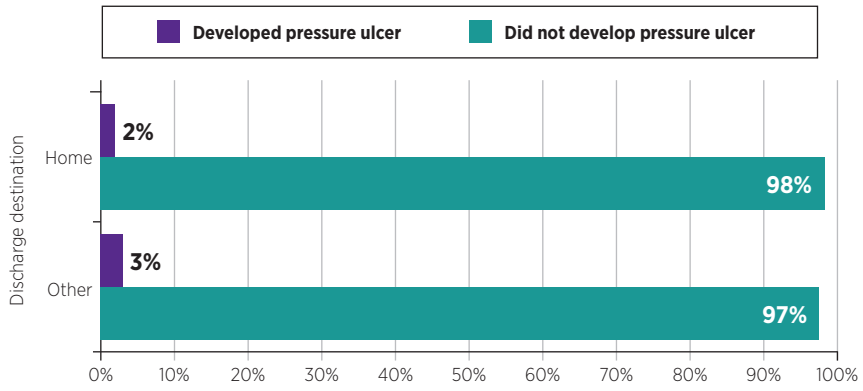


FIGURE 33 IHFS 3: HIP FRACTURE STANDARD 3 PERCENTAGE DEVELOPED PRESSURE ULCER DURING ADMISSION BY DISCHARGE DESTINATION (N=3,497)*

IHFS 4 – percentage of patients reviewed by a geriatrician at any point during admission
Figure 34 shows that less patients discharged directly home were seen by a geriatrician (37%, n=282), in comparison to (54%, n=1,472) of patients who were transferred elsewhere.

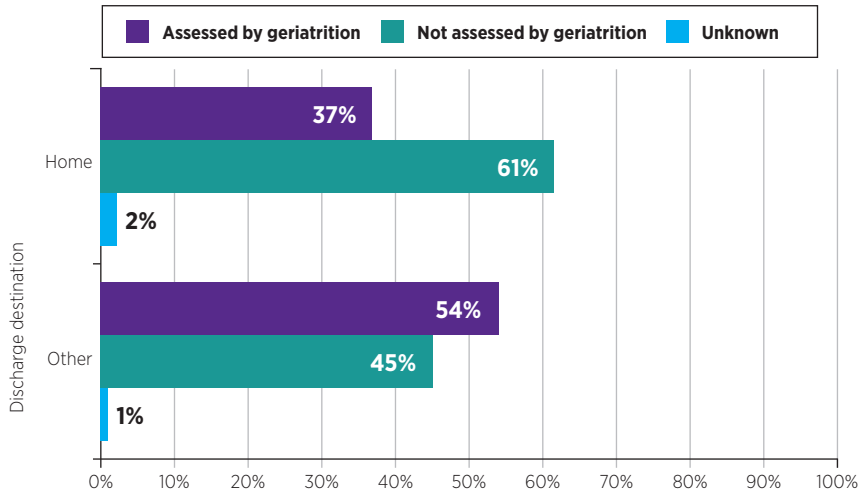


FIGURE 34 IHFS 4: HIP FRACTURE STANDARD 4 PERCENTAGE SEEN BY A GERIATRICIAN DURING ADMISSION BY PATIENTS BY DISCHARGE DESTINATION (N=3,497)*

* Please note: Percentages may not sum to 100% due to rounding.

IHFS 5 – percentage of patients receiving a bone health assessment

Figure 35 shows that the proportion of patients receiving a bone health assessment by discharge destination.

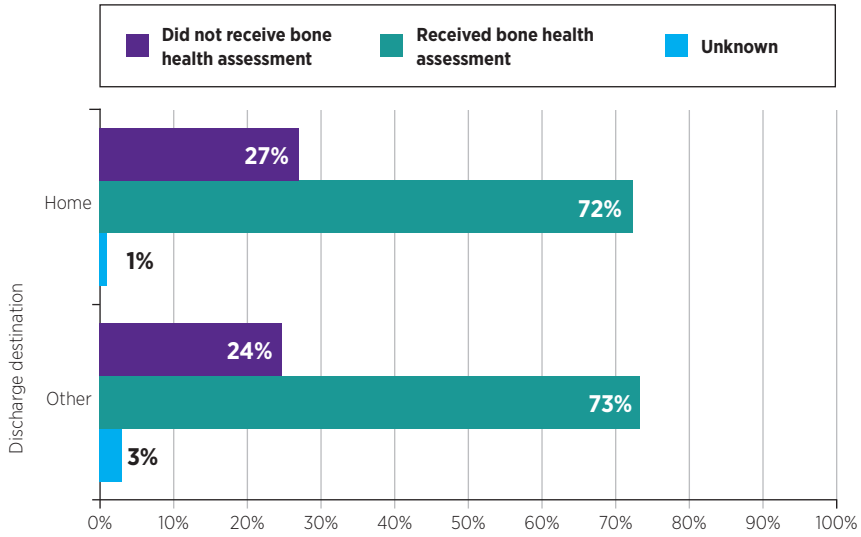


FIGURE 35 IHFS 5: HIP FRACTURE STANDARD 5 PERCENTAGE OF PATIENTS RECEIVING A BONE HEALTH BY DISCHARGE DESTINATION (n=3,320)*

IHFS 6 – percentage of patients receiving a specialist falls assessment

Figure 36 shows that less patients discharged directly home received a specialist falls assessment 41% (n=311) compared to patients discharged elsewhere 48% (n=1,235).

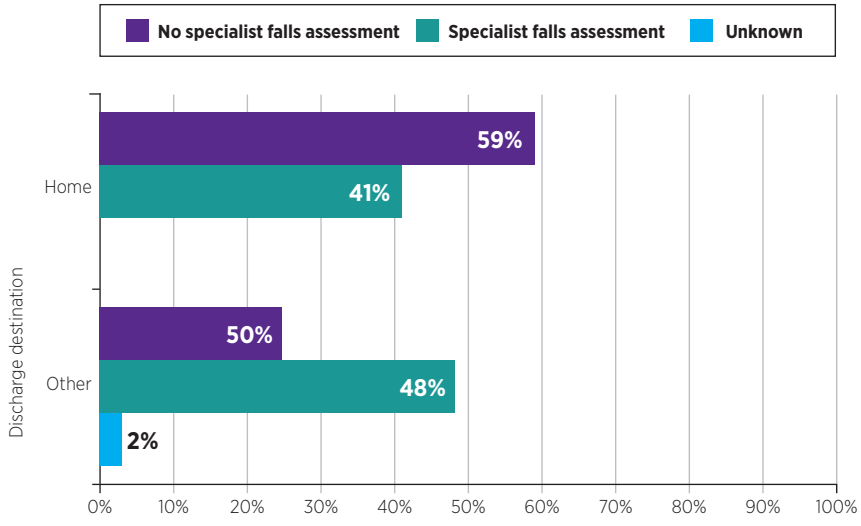


FIGURE 36 IHFS 6: HIP FRACTURE STANDARD SIX PERCENTAGE RECEIVING A SPECIALIST FALLS ASSESSMENT BY DISCHARGE DESTINATION (n=3,320)*

* Please note: Percentages may not sum to 100% due to rounding.

FUNCTIONAL OUTCOMES: CUMULATIVE AMBULATORY SCORE (CAS)

Data for first postoperative day and day of discharge was recorded and compared between the group discharged directly home (n=252) and those discharged elsewhere (n=950). The analysis shows that 46% (n=116) of patients in the discharge directly home group achieved full functional mobility defined as a maximum score of 6 on the CAS, this is in contrast to only 11% (n=100) of those discharged elsewhere. This highlights that functional level on day of discharge is a big factor of those group of patients who are ultimately discharged directly home from hospital.

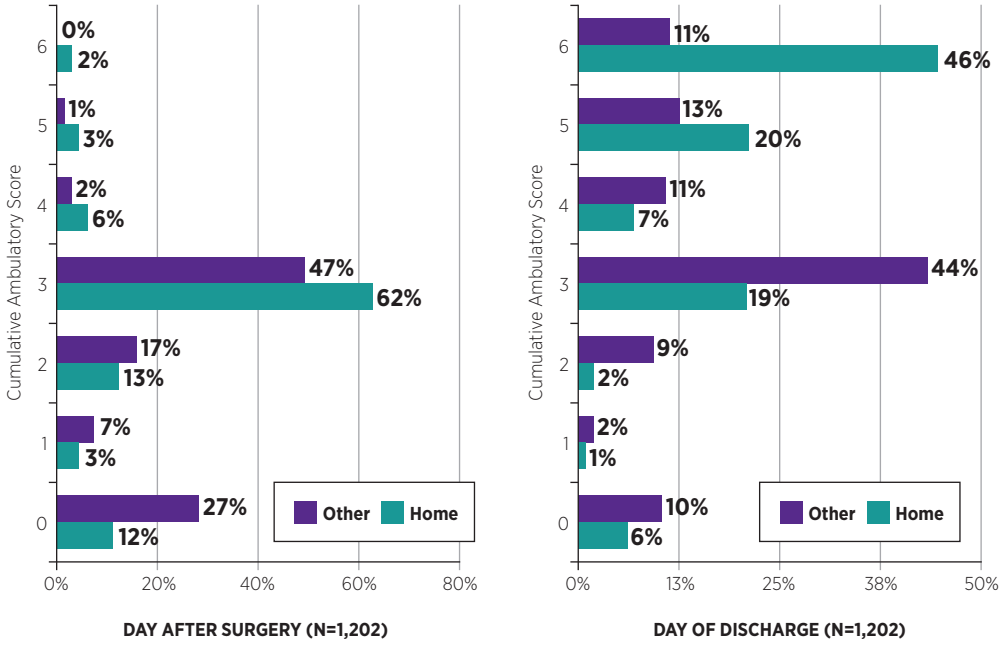


FIGURE 37: FUNCTIONAL OUTCOMES: CUMULATIVE AMBULATORY SCORE (CAS) PERCENTAGES BY DISCHARGE DESTINATION (n=1,202)*

LENGTH OF STAY (LOS)

The median and mean length of stay for the group of patients discharged directly home (n=760) is 12 days and 20 days respectively and for the group with discharge destination other recorded (n=2,737) the median and mean length of stay is 13 days and 20 days respectively.

* Please note: Percentages may not sum to 100% due to rounding.

CHAPTER 9

HOSPITAL HIP FRACTURE GOVERNANCE COMMITTEE SURVEY

CHAPTER 9: **HOSPITAL HIP FRACTURE GOVERNANCE COMMITTEE SURVEY**

This chapter explores the governance structures for hip fracture care within the local reporting hospitals. Robust clinical audit is determined by a cyclical process whereby there is continuous review and feedback of data quality and care standards. NOCA is responsible for the provision of regular, relevant, and timely data and for supporting the hospitals participating in this clinical audit. In the *Irish Hip Fracture Database National Report 2016*, one of the key recommendations was:

NOCA WILL PROVIDE GUIDANCE AND SUPPORT TO ALL OF THE LOCAL HIP FRACTURE GOVERNANCE COMMITTEES

In 2017, the IHFD Governance Committee agreed to survey hospital governance committee arrangements prior to issuing guidance to determine the needs of the hospitals. NOCA conducted an explorative survey of governance structures for hip fracture care in all of the participating hospitals between May and June 2018. Guidance for either the development or enhancement of current governance arrangements in the local hospitals was provided following this (see Appendix 6).

This chapter shows the details of this survey summarised in Table 7 and Table 8. Table 7 describes the membership and structure of the groups in the individual hospitals. One hospital has no hip fracture governance committee in place, and therefore would not be eligible to receive the BPT; NOCA has engaged directly with this hospital to ensure that such structures are developed. A further two hospitals discuss hip fracture care at other hospital meetings but not specifically at a hip fracture governance committee meeting and therefore will also not be eligible to receive the BPT. NOCA will be encouraging hospitals to develop a HFGC as specified in Appendix 6.

Table 8 details quality improvements in the local hospitals and serves as a great learning opportunity for each of the participating hospitals to share their work with one another. This will be further enhanced by a quality improvement workshop which will be held in November 2018 with all participating IHFD hospitals. This table also identifies areas of concern or gaps in care within the current services.

TABLE 7: HOSPITAL HIP FRACTURE GOVERNANCE COMMITTEE SURVEY

HOSPITAL RESOURCES

Hospital Name	Letterkenny	Mayo	Sligo	Galway	Beaumont	Connolly	Drogheda	Tullamore	St James's	Tallaght	Mater	SVUH	Limerick	Cork	Kerry	Waterford
Do you have a hospital HIP fracture governance committee?	YES	NO	YES	OTHER	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	OTHER	YES
When was this established?			APRIL 2018	SEPTEMBER 2017	APRIL 2016	2016	2014	MARCH 2016	2018	2018	2016	2012	MARCH 2017	2017	FEBRUARY 2018	2018
How often did you meet? (Monthly/Quarterly/Other)	Quarterly		Other	Other	Quarterly	Quarterly	Other	Other	Quarterly	Other	Monthly	Monthly	Quarterly	Monthly		Quarterly
Is there a chairperson for the the group?	Yes		Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes
Who is the chairperson?	Mr Peter O'Rourke		Ann Marie Mullen		Dr Linda Brewer	Mr Paddy Kenny	Mr Anant Mahapatra	Ms Dorothy Niall	Dr Ger McMahon & Mr Tom McCarthy	David Askin	Dr McGlynn 2017/ Professor Duggan 2018	Mr Conor Hurson		Tony McNamara		Professor May Cleary
Chairperson's job title	Consultant Orthopaedic Surgeon		IHFD Audit Coordinator		Consultant Geriatrician	Consultant Orthopaedic Surgeon	Orthopaedic Consultant/ Hon Senior Lecturer RCSI	Consultant Orthopaedic Surgeon	Consultants in EM and Orthopaedics	IHFD Audit Coordinator	Consultant Geriatrician	Consultant Orthopaedic Surgeon		CEO		Consultant Orthopaedic Surgeon
Is there an agenda provided for each meeting?	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Are minutes taken at the meeting?	Yes		Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes

TABLE 7: HOSPITAL HIP FRACTURE GOVERNANCE COMMITTEE SURVEY *(CONTINUED)*

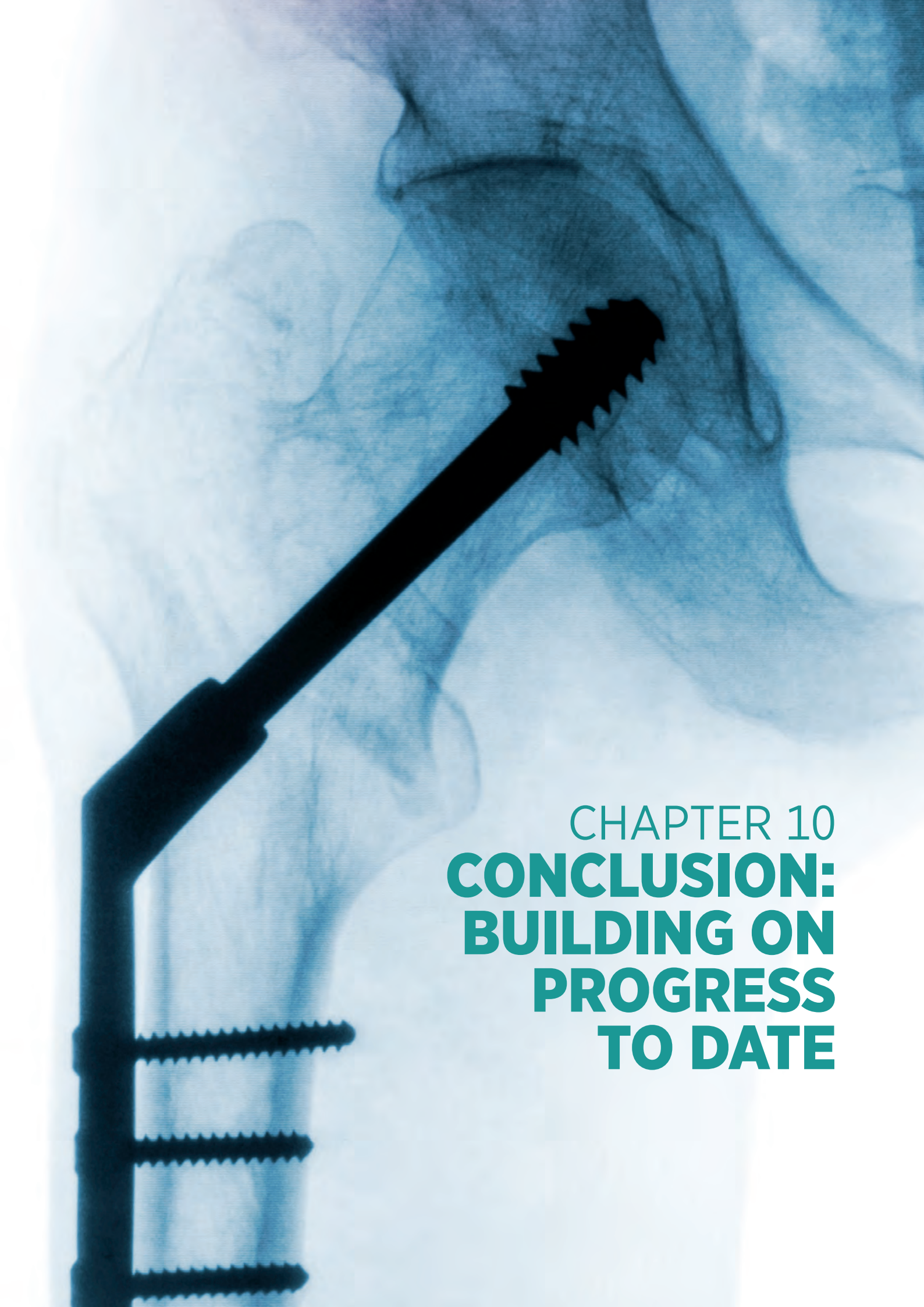
Hospital Name	Letterkenny	Mayo	Sligo	Galway	Beaumont	Connolly	Drogheda	Tullamore	St James's	Tallaght	Mater	SVUH	Limerick	Cork	Kerry	Waterford
Members of the governance committee representing the following specialities are part of this group:																
Orthopaedics	X		X		X	X	X	X	X	X	X	X	X	X		X
Geriatrics	X		X		X	X		X	X	X	X	X	X	X		
Anaesthetics	X		X		X	X	X	X	X		X			X		
Emergency medicine			X		X	X	X	X	X		X	X		X		
Radiology											X			X		
HSCP					X		X		X	X	X	X				
Nursing	X		X		X	X	X	X	X	X	X	X	X			X
Quality and safety									X		X	X		X		
Risk management	X										X					X
Senior hospital management	X		X			X	X	X	X		X	X	X			X
Rehabilitation			X		X			X	X	X	X	X		X		
Administration								X	X			X	X			
Patient/public representative														X		
Ambulance personnel																
HIPE					X			X			X	X	X	X		
Which of the following topics are discussed at the governance committee meeting?																
Irish Hip Fracture Database standards	X		X		X	X	X	X	X	X	X	X	X	X		X
Data quality			X		X	X	X	X	X	X	X	X	X	X		X
Best Practice Tariff			X			X	X	X	X	X	X	X	X			X
Quality improvement	X		X		X	X	X	X	X	X	X	X	X	X		X
Patient safety			X		X	X			X	X	X	X	X	X		X
Early mobility			X		X	X	X	X	X	X	X	X		X		
Inpatient falls						X				X	X			X		X
Length of stay					X	X	X	X	X	X	X	X	X			
Mortality						X			X			X	X	X		X
Delayed discharges						X	X		X	X		X	X			
Staffing					X		X		X	X	X	X		X		
Service needs			X		X	X	X	X	X	X	X	X	X			X
Critical incidents							X				X	X		X		X
Complaints												X				X

TABLE 8: QUALITY IMPROVEMENTS AND AREAS FOR IMPROVEMENT, HIGHLIGHTED BY HOSPITAL

Hospital	Quality improvements	Areas for improvement
Letterkenny University Hospital	• Recent appointment of an orthogeriatrician	• Utilisation of bed capacity (beds blocked by other specialities) • Theatre equipment needs replacement
Sligo University Hospital	• Improvement in IHFS 1 • Improvements in all other IHFS	• Large percentage of patients missing IHFS 1 by just a few minutes
University Hospital Galway	• Establishing a weekly orthogeriatric ward round • Establishing a Quality Improvement group to address IHFS 1 • Establishing a protected/ designated hip fracture bed on the orthopaedic ward	• HIPE coding – difficulty reconciling clinical data with HIPE and with IHFD data points • Need for protected time for the audit coordinator • Insufficient clinical nurse specialists to meet the needs of expanding service
Beaumont Hospital	• Recent orthopaedic ward policy developments • Approval of the orthogeriatric registrar post • Appointment of a fifth orthopaedic consultant • Appointment of a dedicated clinical nurse manager (CNM) for data collection • Improved coordination/attendance at multidisciplinary team (MDT) governance committee ward	• Delayed time to ward/theatre • High rate of pressure ulcer development in hip fracture patients • Lack of medical (geriatric medicine) presence on the orthopaedic ward
Connolly Hospital	• Pressure ulcer improvements quality review • Improvements in Cavan hip fracture bypass protocol	• Delay to operating theatre • Delay from the ED to the orthopaedic ward • Direct admission from Cavan to avoid the ED in Connolly needs a review
Our Lady of Lourdes Hospital, Drogheda	• Development of a 'Suspected neck of femur pathway' for ED • Implementation of a falls assessment tool for hip fracture patients • AMTS implemented	• An orthogeriatrician needs to be appointed. • Implement a bone health assessment
Midland Regional Hospital, Tullamore	• Protected bed in orthopaedic ward (2017) • Fast-track pathway from the ED introduced in December 2017 • Warfarin reversal protocol (2017)	• Delay in transfer to orthopaedic ward • Delay to theatre
Tallaght University Hospital	• Routine geriatrician referral/new delirium assessment test (4AT) • Application for orthogeriatrician submitted • Inpatient falls audit and safer mobility pilot project	• Limited orthogeriatric service • No ring-fencing of beds/outlying patients • Length of time spent in the ED • Access to rehabilitation beds

TABLE 8: QUALITY IMPROVEMENTS AND AREAS FOR IMPROVEMENT, HIGHLIGHTED BY HOSPITAL *(CONTINUED)*

Hospital	Quality improvements	Areas for improvement
Mater Misericordiae University Hospital	• Dedicated and protected bed • Direct pathway to theatre • App for notification of patient attendance in the ED	• Improve time to surgery • Increase the number of orthopaedic beds • Appoint consultant orthogeriatrician
St Vincent's University Hospital	• Ward notification (bleep) to alert ward that there is a hip fracture in the ED • Warfarin reversal protocol implemented • Appointment of a physiotherapy assistant	• Improve compliance with IHFS1 • Improve discharge planning • Increase physiotherapy resource
University Hospital Limerick	• Hip fracture bed availability audit conducted • Review and amendment of hip fracture admission pathway • Audit of the impact that an extra theatre list has on the IHFS	• Compliance with IHFS 1 and 2 needs improvement
Cork University Hospital	• Development of a trauma floor • Improvement in data coverage • Introduction of a paramedic code for hip fractures • Introduction of a new document to fast-track hip fracture patients	• Designated hip fracture bed needed • Orthogeriatrician needed • Need for physiotherapy seven days a week
University Hospital Kerry	• Appointment of candidate orthogeriatric advanced nurse practitioner • Establishing a neck of femur group	• No orthogeriatrician • Not currently meeting all six IHFS due to absence of an orthogeriatrician, and therefore will not qualify for monies allocated from the BPT • Need to establish a HFGC
University Hospital Waterford	• Introduction of hip fracture bypass in the south-east • Introduction of PUTZ Collaborative • Appointment of an orthogeriatrician registrar and advertisement for a consultant	• No office for audit coordinator to enter data in a timely manner • Improve IHFS2- time to surgery • Improve IHFS1- Admission to orthopaedic ward within four hours • Administrative support for IHFD audit coordinator • Need for physiotherapy seven days a week
St James's Hospital	• Increased orthogeriatric input • Introduction of revised ED integrated care pathway (ICP) with regional ultrasound block as standard • Reduction in pressure ulcers in orthopaedic ward due to a patient pathway process review	• Improve IHFS1 • Rising prevalence of decubitus ulceration • Achieving 100% on all six IHFS, with ensuing BPT funding to be assigned to improvements for patient experience on the orthopaedic ward.
Mayo University Hospital	• Improvement in the data coverage from 2016	• Need to establish a HFGC



CHAPTER 10

CONCLUSION: BUILDING ON PROGRESS TO DATE

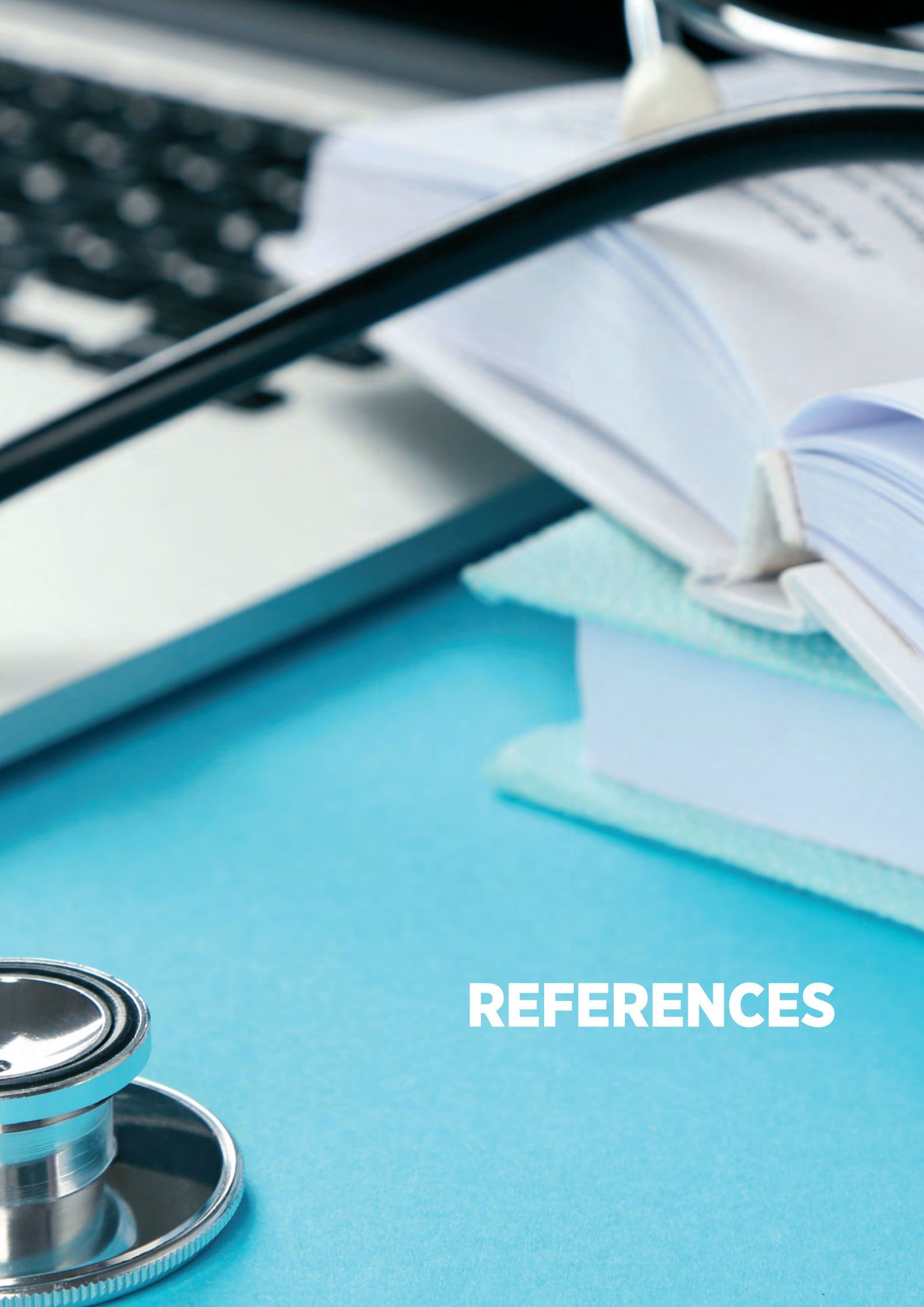
CHAPTER 10: **CONCLUSION: BUILDING ON PROGRESS TO DATE**

Modern healthcare is a complex system that requires reliable measurement to determine the quality of care being provided. All patients presenting with a hip fracture to the sixteen hospitals participanting in the IHFD have a right to expect the highest standard of care. This fifth national IHFD report shows the dedication and commitment of healthcare professionals involved in the management of hip fracture patient care towards this.

One of the main objectives of the IHFD is to provide good quality data that is relevant and reliable to healthcare staff to inform them about the current care delivery in their service and allow them use the data for quality improvement. This report highlights just how far the IHFD has come on that journey.

This report flags the progress of the IHFD:

- Achieving 95% coverage in 2017
- Development of the IHFS
- Reporting hospital level data comparing 2016 and 2017
- Reporting hospital stories as exemplars of good performance or improvement
- Quality improvement summary from each hospital
- Progress of the BPT
- Subgroup analysis of patients discharged directly home.



REFERENCES

REFERENCES

Bellelli, G., Morandi, A., Davis, D.H.J., Mazzola, P., Turco, R., Gentile, S., Ryan, T., Cash, H., Guerini, F., Torpilliesi, T., Del Santo, F., Trabucchi, M., Annoni, G. and MacLullich, A.M.J. (2014). Validation of the 4AT, a new instrument for rapid delirium screening: a study in 234 hospitalised older people. *Age and Ageing,* 43(4), pp. 496-502.

British Orthopaedic Association (2007). *The care of patients with fragility fracture*. [Online]. London: British Orthopaedic Association. Available from: http://www.bgs.org.uk/pdf_cms/pubs/Blue%20Book%20on%20fragility%20fracture%20care.pdf [Accessed 17 July 2018].

Dripps, R. (1963). New classification of physical status. *Anesthesiology,* 24, p. 111.

Dubljanin-Raspopović, E., Marković-Denić, L., Marinković, J., Nedeljković, U. and Bumbaširević, M. (2013). Does early functional outcome predict 1-year mortality in elderly patients with hip fracture? *Clinical Orthopaedics and Related Research,* 471(8), pp. 2703-2710.

Gibbons, W., Shanks, H.T., Kleinhelter, P. and Jones, P. (2006). Eliminating facility-acquired pressure ulcers at Ascension Health. *The Joint Commission Journal on Quality and Patient Safety,* 32(9), pp. 488-496.

Health Information and Quality Authority (2018). *Guidance on a data quality framework for health and social care* Dublin: Health Information and Quality Authority (HIQA).

Health Service Executive Quality and Patient Safety Directorate (2018). *Final report Pressure Ulcers to Zero Collaborative Phase 3 November 2016 – February 2018*. Dublin: Health Service Executive.

Health Service Executive Quality Improvement Division (2016). *Framework for improving quality in our health service: Part 1: introducing the framework*. Dublin: Health Service Executive Quality Improvement Division.

Hirose, J., Ide, J., Yakushiji, T., Abe, Y., Nishida, K., Maeda, S., Anraku, Y., Usuku, K. and Mizuta, H. (2010). Prediction of postoperative ambulatory status 1 year after hip fracture surgery. *Archives of Physical Medicine and Rehabilitation,* 91(1), pp. 67-72.

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

Institute for Healthcare Improvement (2004). The breakthrough series: IHI's collaborative model for achieving breakthrough improvement. *Diabetes Spectrum*, 17(2), pp. 97-101.

Johansen, A., Golding, D., Brent, L., Close, J., Gjertsen, J.-E., Holt, G., Hommel, A., Pedersen, A.B., Röck, N.D. and Thorngren, K.-G. (2017). Using national hip fracture registries and audit databases to develop an international perspective. *Injury,* 48(10), pp. 2174-2179.

Kelly, M.A., McGowan, B., McKenna, M.J., Bennett, K., Carey, J.J., Whelan, B. and Silke, C. (2018). Emerging trends in hospitalisation for fragility fractures in Ireland. *Irish Journal of Medical Science*, pp. 1-8.

Kristensen, M.T., Bandholm, T., Foss, N.B., Ekdahl, C. and Kehlet, H. (2008). High inter-tester reliability of the new mobility score in patients with hip fracture. *Journal of Rehabilitation Medicine,* 40(7), pp. 589-591.

Kristensen, M.T., Bandholm, T., Holm, B., Ekdahl, C. and Kehlet, H. (2009). Timed up & go test score in patients with hip fracture is related to the type of walking aid. *Archives of Physical Medicine and Rehabilitation,* 90(10), pp. 1760-1765.

Kristensen, M.T., Ekdahl, C., Kehlet, H. and Bandholm, T. (2010). How many trials are needed to achieve performance stability of the timed up & go test in patients with hip fracture? *Archives of Physical Medicine and Rehabilitation,* 91(6), pp. 885-889.

Kristensen, M.T., Jakobsen, T.L., Nielsen, J.W., Jørgensen, L.M., Nienhuis, R.J. and Jønsson, L.R. (2012). Cumulated Ambulation Score to evaluate mobility is feasible in geriatric patients and in patients with hip fracture. *Danish Medical Journal,* 59(7), A4464.

McLellan, A.R., Reid, D.M., Forbes, K., Reid, R., Campbell, C., Gregori, A., Raby, N. and Simpson, A. (2004). *Effectiveness of strategies for the secondary prevention of osteoporotic fractures in Scotland*. CEPS: 99/03. Edinburgh: NHS Quality Improvement Scotland.

National Clinical effectiveness Committee. *Prioritisation and Quality Assurance for National Clinical Audit* (2015) [online]. Available from: http://health.gov.ie/wp-content/uploads/2015/12/prioritisation-and-Quality-assurancefor-National-Clinical-audit.pdf [Accessed 18 July 2017].

National Institute for Health and Care Excellence (2011) *Hip fracture: management*. [CG124]. [Online]. London: National Institute for Health and Care Excellence. Available from: https://www.nice.org.uk/guidance/cg124/resources/hipfracture-management-pdf-35109449902789 [Accessed 17 July 2018].

O'Hare, J.A. (2008). Anatomy of the ward round. *European Journal of Internal Medicine,* 19(5), pp. 309-313.

Parker, M.J. and Palmer, C.R. (1993). A new mobility score for predicting mortality after hip fracture. *The Bone & Joint Journal,* 75-B(5), pp. 797-798.

Shanahan, E., Henderson, C., Butler, A., Lenehan, B., Sheehy, T., Costelloe, A., Carew, S., Peters, C., O'Connor, M., Lyons, D. and Ryan, J. (2016). Dedicated orthogeriatric service saves the HSE a million euro. *Irish Medical Journal,* 109(4), p. 385.

APPENDICES

APPENDIX 1: IHFD DATASET

HIPE Portal Data Entry/Hip Fracture Admission (V6.0.1) 19 December 2017

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: IHFD DATASET

HIPE Portal Data Entry/Hip Fracture Admission (V6.0.1) 19 December 2017

Question	Options
6C. Pre-fracture shopping	0 Unable, 1 Assistance of one person, 2 With an aid, 3 independent
6D. Pre-fracture new mobility score (sum A+B+C)	
7. AMT Performed	1 Yes, 2 No, 3 Patient Refused, 9 Not Documented
7A. AMTS	00 - 10
8. Side of fracture	1 Left, 2 Right, 3 Both
8A. Type of fracture	1 Intracapsular – displaced 2 Intracapsular – undisplaced 3 Intertrochanteric 4 Subtrochanteric 5 Periprosthetic 8 Other 9 Not documented
8B. Type of fracture (Other, please specify)	
8C. Type of fracture (right)	See Question 8A
8D. Type of fracture (right, other, please specify)	
9. Pathological	1 Atypical, 2 Malignancy, 3 No, 9 Not documented
10. History of previous fragility fracture(s)	1 Yes, 2 No, 9 Not documented
11. 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
11A. Assessed by geriatrician during this acute admission	1 Yes, 2 No, 9 Not documented
11B. Geriatrician assessment date	
11C. Geriatrician assessment time	
11D. Geriatrician grade	1 Consultant 2 SpR 3 Registrar 8 Other 9 Not documented

APPENDIX 1: IHFD DATASET

HIPE Portal Data Entry/Hip Fracture Admission (V6.0.1) 19 December 2017

Question	Options
12. Nutritional risk assessment performed on admission	0 No 1 Indicates malnourished 2 Indicates risk of malnutrition 3 Indicates normal
13. Nerve block in ED or ward before arrival in theatre suite	1 Yes, 2 No 9 Not documented
14. Operation	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
14A1. Type of implant (fx type = intracapsular)	1 ETS 2 Bipolar Exeter 3 Corail 4 Austin Moore 5 C Stem 6 Thompsons 7 Charley Bipolar 8 Trilliance 9 Pinnacle
14A2. Type of implant (fx type = intertrochanter)	1 Screws 2 DHS 3 Gamma nail long 4 Gamma nail short 5 Intertan
14A3. Type of implant (fx type = periprosthetic)	1 ORIF 2 Revision
14A. ASA grade	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

APPENDIX 1: IHFD DATASET

HIPE Portal Data Entry/Hip Fracture Admission (V6.0.1) 19 December 2017

Question	Options
14B. Type of anaesthesia	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
14C. Surgeon Grade	1 Consultant 2 Specialist registrar 3 Registrar 4 SHO 8 Other 9 Not documented
14C2. Was consultant orthopaedic surgeon present in the operating room?	1 Yes, 2 No 9 Not documented
14D. Anaesthetist grade	1 Consultant 2 Specialist registrar 3 Registrar 4 SHO 8 Other 9 Not documented
14D2. Was consultant anaesthetist present in the operating room?	1 Yes, 2 No 9 Not documented
14E. Date of primary surgery	
14F. Time of primary surgery	
14H. 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
14H2. Other reason if delay >48 hours	
14J. Mobilised on day of or day after surgery	1 Yes, 2 No, 9 Not documented
14J2. Mobilised by	1 Physiotherapist, 8 Other, 9 Not documented
14K. Physiotherapy assessment on day of or day after surgery	1 Yes, 2 No, 9 Not documented

APPENDIX 1: IHFD DATASET

HIPE Portal Data Entry/Hip Fracture Admission (V6.0.1) 19 December 2017

Question	Options
14L. Cumulative Ambulatory Score – day after surgery (0–6)	
14M. 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
15. Operation (Right)	See Q12
16. Pressure ulcers	1 Yes, 3 No, 9 Not documented
17. Specialist falls assessment	0 No, 1 Yes - performed on this admission 2 Yes - awaits further out-patient assessment
18. Bone protection medication	0 No assessment 1 Started on this admission 2 Continued from pre-admission 3 Awaits DEXA scan 4 Awaits outpatient assessment 5 Assessed – no bone protection medication needed/appropriate
18A. If medication type changed during admission, please document	1 Yes, 3 No, 9 Not documented
19. Multidisciplinary rehabilitation team assessment	1 Yes, 3 No, 9 Not documented
20. Cumulative Ambulatory Score – day of acute hospital discharge (0–6)	
21. 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
21A. Discharged to (other, please specify)	
22. Is admission data entry complete?	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?	See page 2 of this report
How do I get access to the IHFD?	The clinical lead for each hospital must approve access and email the Irish Hip Fracture Database Manager (Louisebrent@noca.ie), who will then arrange access via the HPO.
What do I do if I forget my username and password?	Contact ihfd@noca.ie.
Can I view anyone else's data?	No; each hospital is registered separately and can only view its 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; however, the request must come from the clinical lead.
How long will it take to enter data?	Entering the data takes less than 15 minutes per patient entry, but time must be factored in for the collection of the data (i.e. sourcing notes, access to IT systems, and administrative duties). There are two options for data entry, which will vary according to experience, but will usually consist of the following: **1. Pre-Discharge** a. Type in the Medical Record Number, e.g. 1234567. b. Click on 'New Case'. c. Enter the hip fracture data. d. Click on 'Store'. Note: Only select the option 'Store as Non-Admitted Episode' if you are sure the patient was not admitted during this episode of care. 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. **2. Post-discharge** a. Type in the Medical Record Number, e.g. 1234567. b. Click on the relevant discharge date. c. Enter the hip fracture data under the 'Optional' tab. d. Click on 'Store'.

APPENDIX 2: IHFD FREQUENTLY ASKED QUESTIONS

Question	Answer
Once submitted, can I retrieve records to edit content?	Yes, at any time.
What if data for any question is not documented?	If unknown, enter '99-99-9999' for date and time fields only; otherwise, select the option 'Not documented'.
What if the patient is transferred from another hospital?	Document the hospital the patient first presents at, for example if 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 it is a transfer from within a hospital with no orthopaedic service to an operating hospital, enter the date and time the patient was seen by an orthopaedic team, as this was most likely the time when a diagnosis was 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 while already in hospital or may require acute medical management (i.e. they are not admitted primarily due to a fractured hip). A new field has been added to the dataset, as follows: **Q 4H. Did patient fall during an existing inpatient admission in operating hospital 1= Yes 2 = No**
Admission to orthopaedic ward	Includes dedicated geriatrician-staffed hip fracture wards as well as conventional orthopaedic/trauma wards. Enter 'orthopaedic ward' if the patient was an inpatient on an orthopaedic ward at any time during the acute hip fracture spell.
AMT Score (Abbreviated Mental Test Score)	This 10-item version is a simple and robust screening tool for 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 the IHFD?	Hip fracture cases identified as either a HIPE Injury Diagnosis Code S72.00 to S72.2 OR with a specified type of fracture (e.g. intracapsular – displaced, intracapsular – undisplaced, intertrochanteric, or subtrochanteric) are recorded in the IHFD.
Arthroplasty	Any replacement of the upper femur, including unipolar and bipolar hemiarthroplasties and THRs.
What is a pathological fracture?	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 'malignancy' only if a primary or secondary malignancy is present at the fracture site.

APPENDIX 2: IHFD FREQUENTLY ASKED QUESTIONS

Question	Answer
What is an atypical fracture?	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 in the database). They follow low-trauma injuries and patients may report pre-injury pain.
What are normal working hours?	The National Confidential Enquiry into Perioperative Deaths (NCEPOD) reports from 1997 and 2003 define 'out of hours' as any time outside of 08:00 to 17:59 on weekdays, and any time on a Saturday or Sunday.
When is considered the time of primary surgery?	The time of primary surgery is taken from the time of induction of anaesthesia. The time is shown in hours to two decimal places, e.g. 1.25 = 1 hour 15 minutes, 3.5 = 3 hours 30 minutes, and 2.67 = 2 hours 40 minutes.
When does the clock start ticking?	As soon as the patient arrives in an ED or is seen by the orthopaedic team in the operating hospital.
What is an ASA grade?	The American Society of Anesthesiologists (ASA) devised a pre-operative risk grade based on the presence of comorbidities at the time of surgery. The ASA's (1963) physical status classification is: 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'.
What is meant by 'Routine by medical physician'?	Review by a medical physician at the registrar level or above, i.e. not an orthopaedic surgeon.
What is meant by 'Routine by geriatrician'?	Review by a geriatrician at the registrar level or above.
What is meant by 'Medical review following request'?	Review by a member of the medical team at the registrar level or above following a request from the orthopaedic service or ED.
Reasons for delay to surgery	Please document only the **main** reason for delay. Options are: • Medically unfit – awaiting orthopaedic diagnosis/investigation: this means waiting for an MRI scan or other confirmation of diagnosis. • Medically unfit – awaiting medical review, investigation, or stability: this means waiting for a medical review, as the patient remains medically unfit for surgery/anaesthetic. • Administrative/logistic – awaiting inpatient or high-dependency bed. • Administrative/logistic – awaiting space on theatre list. • Administrative/logistic – problem with theatre/equipment. • Administrative/logistic – problem with theatre/surgical/anaesthetic staff cover. • 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. • Other: any reason other than those given in the list above. • No operation performed.

APPENDIX 2: IHFD FREQUENTLY ASKED QUESTIONS

Question	Answer
Definition of pressure ulcer for IHFD	Did the patient acquire a new pressure ulcer (Grade 2 or above) during the acute admission? • This should be answered as 'yes' **only** if the patient has developed a Grade 2 pressure ulcer or above during their acute orthopaedic admission. • Ignore ulcers acquired during an acute stay but that were acquired more than 120 days after admission. • If nothing is documented and the patient has left the hospital, 'not documented' must be recorded.
Definition of a ward round	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 or her 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).
Specialist falls assessment	A systematic assessment by a suitably trained person, e.g. a geriatrician or a specialist assessment trained nurse, which must cover the following domains: • Falls history (noting previous falls) • Cause of index fall (including medication review) • Risk factors for falling and injury (including fracture) • Medication review From this information, the assessor must formulate and document a plan of action to prevent further falls.
Definition of multidisciplinary rehabilitation assessment team	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 via a virtual ward round) regularly (and at least weekly) to discuss patient treatment and care and to plan shared clinical care goals.

APPENDIX 2: IHFD FREQUENTLY ASKED QUESTIONS

Question	Answer
What drugs constitute bone protection therapy?	Calcium and vitamin D in isolation do not constitute bone protection therapy. **1. Bisphosphonates** (oral, combined with calcium/vitamin D, intravenously) • Etidronate • Alendronate • Risedronate • Ibandronate • Zoledronate • Pamidronate **2. Denosumab** **3. HRT and SERMS** • HRT (various) • Tibolone • Raloxifene **4. Parathyroid hormone** • PTH 1-34 • PTH 1-84 **5. Strontium** • Strontium ranelate **6. Calcium and vitamin D** • Calcitriol • Calcium and vitamin D – various • Alpha-calcidol (or one alpha) **7. Calcitonin**
What is the minimum age for entering patient data onto the IHFD?	The IHFD collects data on all patients over the age of 30, but we only report data on those aged 60 and over.

APPENDIX 3: © ABBREVIATED MENTAL TEST SCORE

PATIENT'S DETAILS: **DATE OF TEST:**		
Scoring *Each correctly answered question scores 1 point.*		
Interpretation *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
TOTAL SCORE		

APPENDIX 4: FREQUENCY TABLES

See Appendix 1: Dataset V6.0.1 for Question (Q) references

Figure 2 and 2A IHFS 1: Admission to orthopaedic ward within four hours or admission to theatre from ED within four hours, by hospital 2016/2017

IHFS1	2017 n	N	%	2016 n	N	%
Mater Misericordiae University Hospital	<5	153	1%	<5	139	1%
Cork University Hospital	10	456	2%	5	240	2%
Tallaght University Hospital	6	185	3%	5	176	3%
Galway University Hospitals	7	236	3%	11	234	5%
St Vincent's University Hospital	15	324	5%	16	294	5%
St James's Hospital, Dublin	15	146	10%	13	169	8%
Midland Regional Hospital, Tullamore	31	215	14%	19	221	9%
University Hospital Waterford	25	356	7%	39	389	10%
Our Lady of Lourdes Hospital, Drogheda	6	202	3%	28	266	11%
University Hospital Kerry	10	146	7%	14	126	11%
Beaumont Hospital	24	205	12%	31	184	17%
Connolly Hospital	27	212	13%	26	151	17%
Sligo University Hospital	62	134	46%	40	125	32%
University Hospital Limerick	75	297	25%	119	300	40%
Letterkenny University Hospital	48	148	32%	63	129	49%
Mayo University Hospital	26	82	32%			
Total	389	3,497	11%	431	3,143	14%

Figures 3 and 3A IHFS 2: Time to surgery within 48 hours (and within normal working hours) by hospital, 2016 and 2017

IHFS2	2017 n	N	%	2016 n	N	%
Cork University Hospital	233	422	55%	132	238	55%
University Hospital Limerick	158	283	56%	185	283	65%
University Hospital Waterford	211	351	60%	261	380	69%
Mater Misericordiae University Hospital	85	138	62%	94	139	68%
Our Lady of Lourdes Hospital, Drogheda	116	187	62%	156	245	64%
Midland Regional Hospital, Tullamore	145	209	69%	150	208	72%
Letterkenny University Hospital	100	144	69%	88	124	71%
Beaumont Hospital	134	192	70%	120	171	70%
University Hospital Kerry	97	138	70%	85	118	72%
St James's Hospital	101	141	72%	108	158	68%
University Hospital Galway	164	223	74%	177	217	82%
Sligo University Hospital	102	133	77%	96	125	77%
Connolly Hospital	168	209	80%	135	146	92%
Mayo University Hospital	65	79	82%			
Tallaght University Hospital	149	173	86%	143	172	83%
St Vincent's University Hospital	290	314	92%	246	279	88%
Total	2,318	3,336	69%	2,176	3,003	72%

APPENDIX 4: FREQUENCY TABLES

See Appendix 1: Dataset V6.0.1 for Question (Q) references

Figures 4 and 4A IHFS 3: Pressure ulcer incidence by hospital, 2016 and 2017

IHFS3	2017 n	N	%	2016 n	N	%
Cork University Hospital	<5	424	1%	8	206	4%
St Vincent's University Hospital	<5	312	1%	6	271	2%
Sligo University Hospital	<5	133	2%	6	115	5%
Our Lady of Lourdes Hospital, Drogheda	<5	192	2%	6	257	2%
Tallaght University Hospital	<5	175	2%	11	161	7%
University Hospital Galway	<5	222	2%	6	215	3%
University Hospital Limerick	6	285	2%	9	277	3%
University Hospital Kerry	<5	137	2%			
University Hospital Waterford	8	343	2%	32	366	9%
Connolly Hospital	5	207	2%	5	144	3%
Letterkenny University Hospital	<5	140	3%			
Mater Misericordiae University Hospital	<5	139	3%	5	95	5%
Midland Regional Hospital, Tullamore	8	207	4%	10	207	5%
Mayo University Hospital	5	80	6%			
Beaumont Hospital	13	189	7%	13	173	8%
St James's Hospital	10	135	7%	13	151	9%
Total	85	3,320	3%	134	2,882	5%

Figures 5 and 5A IHFS 4: Assessment by a geriatrician by hospital, 2016 and 2017

IHFS4	2017 n	N	%	2016 n	N	%
Our Lady of Lourdes Hospital Drogheda	12	202	6%	25	266	9%
University Hospital Kerry	9	146	6%	75	126	60%
Letterkenny University Hospital	14	148	10%	28	129	22%
Mayo University Hospital	8	82	10%			
University Hospital Galway	61	236	26%	106	234	45%
Cork University Hospital	119	456	26%	213	239	89%
Connolly Hospital	72	212	34%	57	151	38%
Tallaght University Hospital	80	185	43%	68	176	39%
Sligo University Hospital	60	134	45%	70	125	56%
University Hospital Waterford	178	356	50%	92	389	24%
St James's Hospital	98	146	67%	107	162	66%
Midland Regional Hospital, Tullamore	171	215	80%	184	221	83%
Mater Misericordiae University Hospital	127	153	83%	102	139	73%
University Hospital Limerick	248	297	84%	241	300	80%
Beaumont Hospital	192	205	94%	161	182	89%
St Vincent's University Hospital	305	324	94%	266	294	91%
Total	1,754	3,497	50%	1,795	3,133	57%

APPENDIX 4: FREQUENCY TABLES

See Appendix 1: Dataset V6.0.1 for Question (Q) references

Figure 6 Bone health assessment/bone protection medication

	n	N
Not known	89	3%
No assessment	824	25%
Assessed – no bone protection medication needed/appropriate	142	4%
Awaits DEXA scan	163	5%
Awaits outpatient assessment	401	12%
Continued from pre-admission	509	15%
Started on this admission	1,192	36%
	3,320	100%

Figures 6A and 6B IHFS 5: Bone health assessment by hospital, 2016 and 2017

IHFS5	2017 n	N	%	2016 n	N	%
Our Lady of Lourdes Hospital, Drogheda	40	192	21%	163	257	63%
Cork University Hospital	201	424	47%	189	233	81%
Mayo University Hospital	40	80	50%			
University Hospital Waterford	179	343	52%	137	368	37%
Sligo University Hospital	70	133	53%	68	119	57%
Connolly Hospital	111	207	54%	63	144	44%
University Hospital Kerry	75	137	55%	88	120	73%
St James's Hospital	112	135	83%	137	158	87%
University Hospital Galway	195	222	88%	215	219	98%
Beaumont Hospital	173	189	92%	166	177	94%
Midland Regional Hospital, Tullamore	192	207	93%	183	207	88%
Mater Misericordiae University Hospital	130	139	94%	94	136	69%
University Hospital Limerick	275	285	97%	259	280	93%
Tallaght University Hospital	170	175	97%	151	161	94%
St Vincent's University Hospital	305	312	98%	252	273	92%
Letterkenny University Hospital	139	140	99%	124	124	100%
Total	2,407	3,320	73%	2,289	2,976	77%

APPENDIX 4: FREQUENCY TABLES

See Appendix 1: Dataset V6.0.1 for Question (Q) references

Figures 7 and 7A IHFS 6: Specialist falls assessment by hospital, 2016 and 2017

IHFS6	2017 n	N	%	2016 n	N	%
University Hospital Galway	0	222	0%			
Mayo University Hospital	1	80	1%			
Our Lady of Lourdes Hospital, Drogheda	6	192	3%	20	257	8%
Tallaght University Hospital	13	175	7%			
University Hospital Kerry	11	137	8%	70	120	58%
Connolly Hospital	31	207	15%	11	144	8%
Cork University Hospital	62	424	15%	209	233	90%
University Hospital Waterford	129	343	38%	79	368	22%
Sligo University Hospital	55	133	41%	66	119	56%
St James's Hospital	89	135	66%	111	158	70%
Midland Regional Hospital, Tullamore	163	207	79%	168	207	81%
University Hospital Limerick	249	285	87%	245	280	88%
Letterkenny University Hospital	123	140	88%	105	124	85%
Mater Misericordiae University Hospital	125	139	90%	85	136	63%
Beaumont Hospital	182	189	96%	167	177	94%
St Vincent's University Hospital	307	312	98%	266	273	97%
Total	1,546	3,320	47%	1,606	2,976	54%

Figure 8 Gender and age group

AGE GROUP	60-69		70-79		80-89		90+		Total	
	N	%	N	%	N	%	N	%	N	%
Male	162	33%	309	32%	445	29%	113	22%	1,029	29%
Female	327	67%	655	68%	1,084	71%	402	78%	2,468	71%
Total	489	100%	964	100%	1,529	100%	515	100%	3,497	100%

Figure 9 Source of admission by age group

AGE GROUP	60-69		70-79		80-89		90+		Total	
	N	%	N	%	N	%	N	%	N	%
Home	413	85%	831	86%	1,227	80%	388	75%	2,859	82%
Transfer from nursing home or other long-stay facility	25	5%	40	4%	188	12%	101	20%	354	10%
Transfer from hospital in HIPE listing	43	9%	84	9%	110	7%	24	5%	261	8%
Other	8	2%	9	1%	4	0%	2	0%	23	1%
Total	489	100%	964	100%	1,529	100%	515	100%	3,497	100%

APPENDIX 4: FREQUENCY TABLES

See Appendix 1: Dataset V6.0.1 for Question (Q) references

Figure 10 Level of cognition of patients with a recorded AMT Score

	n	%
0–6: cognitive impairment	87	32%
7–10: normal cognition	189	68%
Total	276	100%

Figure 11 ASA grade by age group

AGE GROUP	60-69		70-79		80-89		90+		Total	
	N	%	N	%	N	%	N	%	N	%
Grade 1	42	9%	26	3%	7	1%	5	1%	80	3%
Grade 2	233	52%	379	45%	451	33%	128	28%	1,191	38%
Grade 3	152	34%	401	47%	795	59%	270	60%	1,618	52%
Grade 4	18	4%	46	5%	103	8%	49	11%	216	7%
Total	445	100%	852	100%	1,356	100%	452	100%	3,105	100%

Figure 12 New mobility score by age group

AGE GROUP	60-69		70-79		80-89		90+		Total	
	N	%	N	%	N	%	N	%	N	%
Low functional mobility	99	24%	318	38%	804	62%	354	82%	1,575	53%
High functional mobility	315	76%	508	62%	501	38%	80	18%	1,404	47%
Total	414	100%	826	100%	1,305	100%	434	100%	2,979	100%

Figure 12A Pre-fracture level of mobility within three functional activities (NMS) (missing data are excluded from this table)

		n	%
Indoor walking	0	44	1%
	1	241	8%
	2	1,084	36%
	3	1,610	54%
Total		2,979	100%
Outdoor walking	0	335	11%
	1	400	13%
	2	842	28%
	3	1,402	47%
Total		2,979	100%
Shopping	0	1,029	34%
	1	287	10%
	2	408	14%
	3	1,255	42%
Total		2,979	100%

APPENDIX 4: FREQUENCY TABLES

See Appendix 1: Dataset V6.0.1 for Question (Q) references

Figure 13 Fracture type

Type of fracture	N	%
Intracapsular (displaced)	1,417	41%
Intracapsular (undisplaced)	388	11%
Intertrochanteric	1,259	36%
Subtrochanteric	209	6%
Periprosthetic	85	2%
Other	63	2%
Not known	76	2%
Total	3,497	100%

Figure 14 Mode of admission

Mode of admission to ED	N	%
Directly to ED in an operating hospital	3,217	92%
Via ED in first presenting hospital	10	<1%
Seen by an orthopaedic team	261	8%
Not known	9	<1%
Total	3,497	100%

Figure 15 Reason for delay to surgery after 48 hours

Reason for delay	N	%
Awaiting orthopaedic diagnosis or investigation	52	7%
Awaiting medical review, investigation, or stabilisation	483	61%
Awaiting inpatient or high-dependency bed	9	1%
Awaiting space on theatre list	93	12%
Problem with theatre/equipment	3	0%
Problem with theatre/surgical/anaesthetic staff cover	32	4%
Cancelled due to list over-run	59	7%
Other	31	4%
Not known	30	4%
Total	792	100%

Figure 17 Type of anaesthesia

Type of anaesthesia	N	%
GA only	420	13%
GA and nerve block	263	8%
GA and spinal anaesthesia	82	2%
GA and epidural anaesthesia	8	<1%
SA only	1,783	53%
SA and nerve block	740	22%
SA and epidural (CSE)	9	<1%
Other	9	<1%
Not known	6	<1%
Total	3,320	100%

APPENDIX 4: FREQUENCY TABLES

See Appendix 1: Dataset V6.0.1 for Question (Q) references

Figure 18 Type of surgery

Type of surgery	N	%
Other	86	3%
Internal fixation screws	61	2%
Arthroplasty THR uncemented	71	2%
Arthroplasty THR cemented	70	2%
Internal fixation IM nail (long)	355	11%
Arthroplasty hemi uncemented	391	12%
Internal fixation IM nail (short)	436	13%
Internal fixation DHS	704	21%
Arthroplasty hemi cemented	1,162	35%
Total	3,336	100%

Figure 19 Cementing of arthroplasties

Cemented/uncemented	N	%
Cemented	1,232	73%
Uncemented	462	27%
Total	1,694	

Figure 20 Mobilised on day of or day after surgery and mobilised by

Mobilised by	N	%
Yes (by physiotherapist)	2,438	73%
Yes (by other)	143	4%
Yes (by whom not known)	12	<1%
Not mobilised	703	21%
Not known	40	1%
Total	3,336	100%
No surgery	161	

Figure 21 Functional outcomes: CAS

CAS	N	Day after Surgery %	CAS	N	Day after Surgery %
0	284	24%	0	109	9%
1	74	6%	1	25	2%
2	192	16%	2	94	8%
3	600	50%	3	469	39%
4	32	3%	4	118	10%
5	15	1%	5	171	14%
6	5	0%	6	216	18%
Total	1202	100%	Total	1202	100%
Missing	2,134		Missing	2,134	
	3,336			3,336	

APPENDIX 4: FREQUENCY TABLES

See Appendix 1: Dataset V6.0.1 for Question (Q) references

Figure 22 Destination on discharge

Destination on discharge	N	%
Not known	73	2%
Other	149	4%
On-site rehab unit	42	1%
Died	156	5%
New admission to nursing home or long-stay care	210	6%
Convalescence care	475	14%
Return admission to nursing home or long-stay care	485	14%
Home	760	22%
Off-site rehab unit	1,147	33%
Total	3,497	100%

Figure 24 Re-operation within 30 days

Re-operation within 30 days	N	%
Unknown	441	13%
Yes	50	2%
No	2,845	85%
Total	3,336	

Figure 25 Percentage of patients discharged directly home

	N	%
Home	760	21.7
Other	2737	78.3
Total	3497	100

Figure 26 Percentages of patients discharged directly home by gender and age group

AGE GROUP	60-69		70-79		80-89		90+		Total	
	n	%	n	%	n	%	n	%	n	%
Male	62	28%	100	37%	69	32%	9	18%	240	32%
Female	162	72%	173	63%	144	68%	41	82%	520	68%
Total	224	100%	273	100%	213	100%	50	100%	760	100%

Figures 27 Percentage of patients admitted from home by discharge destination

	Discharged Home		Discharged Other		Total	
	N	%	N	%	N	%
Admitted from home	701	92%	2158	79%	2859	82%
Admitted from elsewhere	59	8%	579	21%	638	18%
Total	760	100%	2737	100%	3497	100%

APPENDIX 4: FREQUENCY TABLES

See Appendix 1: Dataset V6.0.1 for Question (Q) references

Figure 28 Percentages of patients by ASA Grade by discharge destination

	Grade 1		Grade 2		Grade 3		Grade 4		Total	
Home	37	6%	345	53%	254	39%	17	3%	653	100%
Other	43	2%	846	35%	1364	56%	199	8%	2452	100%
Total	80	3%	1191	38%	1618	52%	216	7%	3105	100%

Figure 29 Pre-fracture level of mobility by discharge destination

	Low functional Mobility		High functional Mobility		
Home	172	27%	463	73%	635
Other	1403	60%	941	40%	2344
Total	1575	53%	1404	47%	2979

Figure 29A Pre-fracture level of mobility by discharge destination within three functional activities (NMS): indoor walking, outdoor walking, shopping

		Home		Other		Total	
Indoor Walking	0	7	1%	37	2%	44	1%
	1	18	3%	223	9%	241	8%
	2	130	20%	954	41%	1084	36%
	3	480	76%	1130	48%	1610	54%
		635	100%	2344	100%	2979	100%
Outdoor Walking	0	23	4%	312	13%	335	11%
	1	34	5%	366	16%	400	13%
	2	120	19%	722	31%	842	28%
	3	458	72%	944	40%	1402	47%
		635	100%	2344	100%	2979	100%
Shopping	0	87	14%	942	40%	1029	34%
	1	37	6%	250	11%	287	10%
	2	69	11%	339	14%	408	14%
	3	442	69%	813	35%	1255	42%
		635	100%	2344	100%	2979	100%

Figure 30 Fracture type of patients by discharge destination

	Home N	%	Other N	%
Other	41	5%	98	4%
Periprosthetic	20	3%	65	2%
Subtrochanteric	47	6%	162	6%
Intracapsular - undisplaced	111	15%	277	10%
Intertrochanteric	245	32%	1014	37%
Intracapsular - displaced	296	39%	1121	41%
Total	760	100%	2737	100%

APPENDIX 4: FREQUENCY TABLES

See Appendix 1: Dataset V6.0.1 for Question (Q) references

Figure 31 Hip fracture standard 1 percentage admitted to orthopaedic ward within 4 hours including patients that go straight to theatre from by discharge destination

	Home		Other		Total	
	N	%	N	%	N	%
Not admitted to orthopaedic ward within 4 hours	654	86%	2454	90%	3108	89%
Admitted to orthopaedic ward within 4 hours	106	14%	283	10%	389	11%
Total	760	100%	2737	100%	3497	100%

Figure 32 Hip fracture standard 2 percentage receiving surgery within 48 hours (and within normal working hours) by discharge destination

	Home		Other		Total	
	N	%	N	%	N	%
Surgery within 48 hours (within working hours)	554	77%	1764	67%	2318	69%
Surgery after 48 hours (or outside working hours)	167	23%	851	33%	1018	31%
Total	721	100%	2615	100%	3336	100%

Figure 33 Hip fracture standard 3 percentage developed pressure ulcer during admission by discharge destination

	Home		Other		Total	
	N	%	N	%	N	%
Developed pressure ulcer	12	2%	85	3%	97	3%
Did not develop pressure ulcer	748	98%	2652	97%	3400	97%
Total	760	100%	2737	100%	3497	100%

Figure 34 Hip fracture standard 4 percentage seen by a geriatrician during admission by patients by discharge destination

	Home		Other		Total	
	N	%	N	%	N	%
Assessed by geriatrition	282	37%	1472	54%	1754	50%
Not assessed by geriatrition	462	61%	1237	45%	1699	49%
Unknown	16	2%	28	1%	44	1%
Total	760	100%	2737	100%	3497	100%

APPENDIX 4: FREQUENCY TABLES

See Appendix 1: Dataset V6.0.1 for Question (Q) references

Figure 35 Hip fracture standard 5 percentage of patients receiving a bone health assessment by discharge destination

	Home		Other		Total	
	N	%	N	%	N	%
No	210	28%	614	24%	824	25%
Yes	542	72%	1865	73%	2407	73%
Unknown	6	1%	83	3%	89	3%
Total	758	100%	2562	100%	3320	100%

Figure 36 Hip fracture standard six percentage receiving a specialist falls assessment by discharge destination

	Home		Other		Total	
	N	%	N	%	N	%
No specialist falls assessment	446	59%	1290	50%	1736	52%
Specialist falls assessment	311	41%	1235	48%	1546	47%
Unknown	1	0%	37	2%	38	1%
Total	758	100%	2562	100%	3320	100%

Figure 37 Percentage of patients by functional outcomes: Cumulative Ambulatory Score (CAS) by discharge destination

		Home		Other		Total	
		N	%	N	%	N	%
Day after surgery	0	29	12%	255	27%	284	24%
	1	8	3%	66	7%	74	6%
	2	33	13%	159	17%	192	16%
	3	155	62%	445	47%	600	50%
	4	14	6%	18	2%	32	3%
	5	8	3%	7	1%	15	1%
	6	5	2%	0	0%	5	0%
	Total	252	100%	950	100%	1202	100%
Day of discharge	0	14	6%	95	10%	109	9%
	1	2	1%	23	2%	25	2%
	2	5	2%	89	9%	94	8%
	3	48	19%	421	44%	469	39%
	4	17	7%	101	11%	118	10%
	5	50	20%	121	13%	171	14%
	6	116	46%	100	11%	216	18%
	Total	252	100%	950	100%	1202	100%

APPENDIX 5: ADDITIONAL INFORMATION

See Appendix 1: Dataset V6.0.1 for Question (Q) references.

TYPE OF TRAUMA	N	%
High-energy fall	72	2%
Low-energy fall	3,328	95%
Not known	76	2%
Not documented	3	0%
Missing value	18	1%
Total	3,497	100%

PATHOLOGICAL	N	%
Atypical	27	1%
Malignancy	60	2%
No	3,327	95%
Not documented	68	2%
Missing value	15	0%
Total	3,497	100%

HISTORY OF PREVIOUS FRAGILITY FRACTURE	N	%
Yes	748	21%
No	2,503	72%
Not documented	240	7%
Missing value	6	0%
Total	3,497	100%

GERIATRICIAN GRADE [a]	N	%
Consultant	987	56%
Specialist Registrar	202	12%
Registrar	464	27%
Other	5	0%
Not documented	54	3%
Missing value	42	2%
Total	1,754	100%

SURGEON GRADE [b]	N	%
Consultant	1,395	42%
Specialist registrar	1,081	32%
Registrar	590	18%
Senior House Officer (SHO)	36	1%
Other	0	0%
Not documented	5	0%
Missing value	229	7%
Total	3,336	100%

ANAESTHETIST GRADE [b]	N	%
Consultant	2,196	72.50
Specialist Registrar	151	4.99
Registrar	224	7.40
SHO	46	1.52
Not Documented	87	2.87
Missing Value	325	10.73
Total	3,029	100.00

MULTIDISCIPLINARY REHABILITATION TEAM ASSESSMENT [c]	N	%
Yes	3,073	93%
No	191	6%
Not documented	11	0%
Missing value	45	1%
Total	3,320	100%

(a) 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.
(b) Relates to surgical cases only i.e. those with values 1-88 recorded f or Q12.
(c) Excludes patients who died in hospital.

APPENDIX 6: HIP FRACTURE GOVERNANCE COMMITTEE (HFGC) GUIDANCE

WHAT IS GOVERNANCE?

The system through which healthcare teams are accountable for the quality, safety and experience of patients in the care they have delivered (HSE, 2014). What this means to healthcare staff- Specifying the clinical standards you are going to deliver and showing everyone the measurements you have made to demonstrate that you have done what you set out to do (HSE, 2014).

The IHFD National Report 2016 recommends that: 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 (NOCA, 2017).

Health Service Executive, Quality Improvement Division (2016)

RESOURCES

https://www.noca.ie/publications
Template for agenda, minutes & PowerPoint of IHFD standards.

MEETING ETIQUETTE

- Terms of reference developed for group
- Frequency of meetings: Quarterly minimum
- Agenda to be circulated one week in advance
- Minutes to be circulated one week later
- Key actions identified and allocated to specific members at each meeting.

SUGGESTED MEMBERSHIP OF HFGC

- Chair - Clinician
- Vice-Chair (from other professional group)
- IHFD clinical lead and audit coordinator

Members representing: Orthopaedics, Geriatric medicine, Anaesthetics, Emergency medicine, Radiology, HSCP, Nursing, Quality & Safety, Risk management, Senior Hospital Management, Rehabilitation, Administration, Ambulance service, HIPE personnel, Public/ Patient Representative, Bed Manager, Theatre Manager

TOPICS FOR DISCUSSION

- Irish hip fracture standards
- Data quality
- Best practice tariff
- Quality improvement
- Patient safety
- Service needs
- Critical incidents
- Complaints
- Early mobility
- Inpatient falls
- Length of stay
- Mortality
- Delayed discharges
- Staffing.

APPENDIX 7: SPECIFICATIONS FOR COMPOSITE VARIABLES

As illustrated in Figures 2, 3, 5, 14 and 20. See Appendix 1: Dataset V6.0.1 for Question references

FIGURE 2: ADMISSION TO ORTHOPAEDIC WARD

2.1. 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

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

(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 admitted to orthopaedic ward (Q5A-Q5B).

(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 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.

2.3. 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)

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

APPENDIX 7: SPECIFICATIONS FOR COMPOSITE VARIABLES

As illustrated in Figures 2, 3, 5, 14 and 20. See Appendix 1: Dataset V6.0.1 for Question references

FIGURE 3: TIME TO SURGERY – 48 HOURS/WORKING HOURS

3.1. 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

3.2. 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.

3.3. 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)

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

APPENDIX 7: SPECIFICATIONS FOR COMPOSITE VARIABLES

As illustrated in Figures 2, 3, 5, 14 and 20. See Appendix 1: Dataset V6.0.1 for Question references

FIGURE 5: 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 14: 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 20: 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

NOTES

NOTES

National Office of Clinical Audit

Phone: **+353 1 4028577**
Email: **ihfd@noca.ie**
Twitter: **@noca_irl**
www.noca.ie