National Office of Clinical Audit

Irish Hip Fracture Database IHFD

IRISH HIP FRACTURE DATABASE
NATIONAL REPORT 2018

RIGHT CARE,
RIGHT PLACE,
RIGHT TIME,
RIGHT TEAM.

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

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

NOCA supports hospitals to learn from their audit cycles.

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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.

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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.

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NOCA National Office of Clinical Audit

Irish Hip Fracture Database IHFD

Irish Hip Fracture Database

National Report 2018

Right care, Right place, Right time, Right team.

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NOCA National Office of Clinical Audit

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13th September, 2019

IRISH HIP FRACTURE DATABASE NATIONAL REPORT 2018

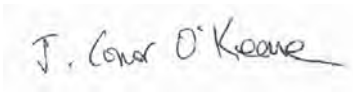
Dear Dr Ahern/Mr Hurson,

I acknowledge receipt of the Irish Hip Fracture Database National Report 2018. Following presentation by Dr Ahern to the NOCA Governance Board on the 13th of September and feedback garnered from our membership, we are delighted to endorse this report.

I wish to congratulate you both, Ms Louise Brent and your colleagues continued efforts in developing and progressing this valuable quality improvement initiative. Much of your work will serve as an exemplar for quality improvement in the context of all NOCA audits.

Please accept this as formal endorsement from the NOCA Governance Board of the Irish Hip Fracture Database National Report 2018

Yours sincerely,



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FOREWORD

The publication of this year's Irish Hip Fracture Database National Report 2018 continues to demonstrate the ongoing improvements that are being made in the care of these patients. Presentation with hip fracture continues to be one of the most potentially disabling acute health-events for older people. The progress and gaps identified within the Irish Hip Fracture Database National Report 2018 merit attention and action locally and nationally.

The report clearly demonstrates the great efforts being made at many sites through local governance groups in addressing identified gaps in care. The significant improvement in access to orthogeriatric services highlights the collaboration being undertaken to manage the needs of this older, vulnerable group. The recommendations clearly point the way towards improving outcomes in the six standards of clinical care. The audit also highlights the large numbers of patients in need of rehabilitation post fracture with low levels of patients being able to discharge directly home post fracture. Meeting these needs as the numbers of older people within our population continue to rise will continue to be an important component of health and social care service development if the gains made heretofore are to be sustained and built on.

I commend, congratulate and thank the team who have produced this analysis. Their ongoing efforts have meant real and substantial improvements to patient care in this area. To those involved in the larger healthcare workforce in their daily efforts to provide care to these patients, the contents of this report should give further motivation and acknowledge efforts to date.

"Ar scáth a chéile a mhaireann na daoine"

Dr Siobhán Kennelly
National Clinical Advisory Group Lead, Older Persons
HSE

ACRONYMS / ABBREVIATIONS

TABLE 1: ACRONYMS / ABBREVIATIONS

ACRONYM	FULL TERM
4AT	rapid clinical test for delirium
AAGBI	Association of Anaesthetists of Great Britain and Ireland
ADON	assistant director of nursing
AFFINITY	National Falls and Bone Health Project (2018–2023)
AMT	Abbreviated Mental Test
ANP	advanced nurse practitioner
APTA	American Physical Therapy Association
ASA	American Society of Anesthesiologists
BCIS	bone cement implantation syndrome
BGS	British Geriatric Society
BIU	Business Intelligence Unit
BOA	British Orthopaedic Association
BPT	Best Practice Tariff
CAS	Cumulative Ambulatory Score
CNM	clinical nurse manager
CNS	clinical nurse specialist
CSE	combined spinal epidural
CUH	Cork University Hospital
DFB	Dublin Fire Brigade
DHS	dynamic hip screw
DOH	Department of Health
DVR	data validation report
DXA	Dual-energy X-ray absorptiometry
ED	emergency department
FFN	Fragility Fracture Network
GA	general anaesthetic
HFGC	hip fracture governance committee
HIPE	Hospital In-Patient Enquiry
HIQA	Health Information and Quality Authority
HPO	Healthcare Pricing Office
HSCP	health and social care professional
HSE	Health Service Executive
IAEM	Irish Association for Emergency Medicine

ACRONYM	FULL TERM
ICD 10	International Classification of Diseases, Tenth Revision
IGS	Irish Gerontological Society
IHFD	Irish Hip Fracture Database
IHFS	Irish Hip Fracture Standards
IITOS	Irish Institute for Trauma and Orthopaedic Surgery
IOA	Irish Orthopaedic Association
ISCP	Irish Society of Chartered Physiotherapists
KPI	key performance indicator
LOS	length of stay
LUH	Letterkenny University Hospital
MISCP	Member of the Irish Society of Chartered Physiotherapists
MMUH	Mater Misericordiae University Hospital
MUH	Mayo University Hospital
MUST	Malnutrition Universal Screening Tool
NAS	National Ambulance Service
NCHD	non-consultant hospital doctor
NICE	National Institute for Health and Care Excellence
NMS	New Mobility Score
NOCA	National Office of Clinical Audit
NQAIS	National Quality Assurance information System
PPI	Public and Patient Interest
PUTZ	Pressure Ulcers to Zero
QIP	Quality Improvement Plan
RCSI	Royal College of Surgeons in Ireland
SA	spinal anaesthetic
SHO	senior house officer
SPSS	Statistical Package for the Social Sciences
SSKIN	Surface, Skin condition, Keep moving, Incontinence, Nutrition
SUH	Sligo University Hospital
THR	total hip replacement
UHW	University Hospital Waterford
UK	United Kingdom

EXECUTIVE SUMMARY

The Irish Hip Fracture Database (IHFD) is a clinically led, web-based audit that measures the best practice standards of care, known as the Irish Hip Fracture Standards (IHFS) (Table 2), and outcomes of patients with hip fractures. The IHFD started as 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.

The data are collected in local hospitals by audit coordinators who enter the data retrospectively from patient medical records. The data are entered into the Hospital In-Patient Enquiry (HIPE) IHFD Portal and linked with a hospital episode of inpatient care. Audit coordinators and clinical leads can generate local reports. The Healthcare Pricing Office (HPO) issues monthly coverage reports to the IHFD Audit Manager, as well as extracts of data on a quarterly basis to NOCA for analysis. These data are analysed and quarterly reports are issued to hospitals and Hospital Groups. In 2018, the Best Practice Tariff (BPT) for hip fracture was introduced. This is a financial payment awarded to hospitals for each case that meets the eight standards highlighted in Table 2. The BPT payments are reported quarterly to hospitals.

The theme for this report is “Right care, Right place, Right time, Right team” in line with the *Sláintecare Implementation Strategy* (Department of Health, 2018). This aligns the IHFD with the current focus of the Health Service Executive (HSE) on delivering the right care to the right patient, in the right setting, and by the right person.

All 16 eligible hospitals are regularly uploading data to the IHFD. Each hospital, through its hip fracture governance committee (HFGC), is encouraged to use these reports for continuous quality improvement. Without the constant leadership provided by the hospital clinical leads and the dedication and hard work of the audit coordinators, this audit would not be possible. The NOCA Executive Team and the IHFD Governance Committee wish to thank the clinical leads, audit coordinators, and staff in the participating hospitals for their continued commitment to, and engagement with, this audit.

TABLE 2: IRISH HIP FRACTURE STANDARDS AND BEST PRACTICE TARIFF MEASURES

IRISH HIP FRACTURE STANDARDS		BEST PRACTICE TARIFF MEASURES
Standard 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.		**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 Standard 1.**
Standard 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).		**If patients receive surgery within 48 hours and during normal working hours, they meet Standard 2.**
Standard 3: All patients with hip fracture should be assessed and cared for with a view to minimising their risk of developing a pressure ulcer.		**If patients do not develop a new Grade 2 or higher pressure ulcer during admission, they meet Standard 3.**
Standard 4: All patients presenting with a fragility fracture should be managed on an orthopaedic ward, with routine access to acute orthogeriatric medical support from the time of admission.		**If patients are reviewed by a geriatrician at any point during their admission, they meet Standard 4.**
Standard 5: All patients presenting with a fragility fracture should be assessed to determine their need for therapy to prevent future osteoporotic fractures.		**If patients receive a bone health assessment, they meet Standard 5.**
Standard 6: All patients presenting with a fragility fracture following a fall should be offered multidisciplinary assessment and intervention to prevent future falls.		**If patients receive a specialist falls assessment, they meet Standard 6.**
		**Minimum quarterly data coverage of 90% is required by individual hospitals.**
		**Evidence of a local HFGC must be present in each hospital.**

KEY FINDINGS

KEY FINDINGS

Overall data coverage of 99% was achieved for 2018, with 10 hospitals achieving 100% data coverage.

In 2018, 17% of patients were admitted to an orthopaedic ward or theatre from the ED within four hours, compared with only 11% of patients in 2017. Although improvements have been made, further progress is required.

In 2018, 72% of surgeries were conducted within 48 hours and within normal working hours. This has improved slightly since 2017.

In 2018, 3% of hip fracture patients developed a pressure ulcer after admission to hospital. This has remained unchanged since 2017.

A geriatrician reviewed more than two-thirds (69%) of patients at some point during their acute hospital stay in 2018. This represents a considerable improvement over 2017, when only 50% of patients were reviewed by a geriatrician.

In 2018, a bone health assessment was carried out on 84% of patients nationally (compared with 73% in 2017). Eleven of the participating hospitals achieved in excess of 90% compliance with this standard in 2018.

Prior to discharge, 70% of patients nationally had a specialist falls assessment in 2018 compared with only 47% in 2017. This marks a significant improvement in the past year.

Although improvements have been made nationally with regard to the IHFS, there continues to be variability in the level of service being provided in the 16 participating hospitals.

In 2018, the BPT was introduced, with hospitals receiving a total of €278,000; this represents 7% of hip fracture patients meeting all eight BPT measures. Sligo University Hospital demonstrated the best performance, with 25% of its patients meeting the BPT measures.

Of the 3,751 hip fracture cases recorded in 2018, 69% were female (n=2586).

The home continues to be the place from which patients are most likely to be admitted (83%, n=3115).

KEY FINDINGS

Only 40% (n=171) of patients aged 60–69 years were assigned an American Society of Anesthesiologists (ASA) Grade of 3 or 4, compared with almost three-quarters (n=381) of patients aged 90 or over, indicating that as age increases, so does medical morbidity.

The most common types of fractures recorded in 2018 were intracapsular (displaced) fractures (38%, n=1408) and intertrochanteric fractures (35%, n=1330).

Ninety-two percent (n=3468) of patients presented directly to an ED in an operating hospital.

Over one-quarter (n=898) of patients received surgery more than 48 hours after their admission to hospital. The recording of the reason for delay in performing surgery needs to be improved.

Forty-two percent (n=1489) of patients received their surgery within 24 hours of admission to hospital.

Seventy-two percent (n=1312) of arthroplasties reported in 2018 were cemented. However, a large proportion of patients received uncemented implants in several hospitals.

There continues to be a low rate of total hip replacements (THRs) performed in Ireland (4%) compared with other international hip fracture registers. The number of orthopaedic surgeons with arthroplasty surgery skills should be examined at a hospital level, and theatre rosters should be planned to maximise the availability of that skill set for patients.

Eighteen percent of patients did not receive a physiotherapy assessment on the first postoperative day. Hospitals not achieving this standard must review their physiotherapy services in order to enable this assessment to take place on the first postoperative day for all hip fracture patients.

One in five patients (n=735) were discharged directly home from hospital; a further 31% (n=1168) required rehabilitation either at an on-site or off-site facility. Six percent (n=214) of patients were recorded as new admissions to a nursing home or long-stay care facility following discharge.

The mean and median lengths of stay for hip fracture patients were 18.7 and 12 days, respectively, a reduction of approximately 900 acute bed days from 2017.

KEY RECOMMENDATIONS

IHFD STRATEGIC FOCUS

- The IHFD team will further align our focus, recommendations and work to the Sláintecare programme to improve the quality of hip fracture care for people from home to home, promote health to prevent further falls and fractures, and provide timely access to care: "Right care, Right place, Right time, Right team". We will continue to measure and publish our performance in order to inform and create a system that works for patients and the changing needs of the population.

HOSPITAL GOVERNANCE

- Each hospital HFGC will engage in quality improvement, using the quarterly IHFD hospital and BPT reports to increase compliance with the IHFS.

CLINICAL CARE

- Hospital HFGCs will focus on admitting patients to an orthopaedic ward or for surgery within four hours of presentation.
- Hospital HFGCs will continue to develop multidisciplinary orthogeriatric services.
- All hospitals will focus on increasing the number of patients assessed and mobilised by a physiotherapist on day one after surgery.
- All healthcare staff should promote a culture of activity and functional independence among hip fracture patients and their carers.
- Hospital HFGCs will focus on increasing the number of patients going home after a hip fracture and reducing the number of patients going into long-term care.
- The IITOS will review the level of variation in types of implants, including cemented/uncemented prostheses and THRs being undertaken in the hip fracture population.

DATA QUALITY

- Hospitals will submit data in a timely manner to achieve 90% data coverage quarterly and annually.
- NOCA will build robust data validation reports and provide improved quarterly reports for the IHFD to the participating hospitals.

IHFD DEVELOPMENTS

- NOCA will continue to progress the development of long-term outcome measures for the IHFD.
- NOCA should increase the level of patient and public involvement in the development and progress of the IHFD.

TABLE 3: IMPACT OF THE IHFD TO DATE

NATIONAL

- Increase in timely admission to orthopaedic ward
- Increase in timely surgery
- Increase of geriatrician assessment
- Increase in secondary prevention for bone health and falls assessment
- Reduction of pressure ulcer incidence

LOCAL

- Quality Improvement hospital projects featured in the national report and at the annual hip fracture conference
- An IHFD workshop tailored to support audit coordinators' needs

IMPACT OF THE IHFD

SYSTEM

- Introduction of national bypass for hip fractures led by the Clinical Programme for Trauma and Orthopaedic Surgery, National Ambulance Service (NAS)/ Dublin Fire Brigade (DFB), and the Health Service Executive (HSE)
- Development of orthogeriatric services in more than 80% of hospitals participating in the IHFD
- Introduction of the BPT
- Support for the trauma system reconfiguration
- In 2019, IHFD data to become the primary source of information for the national key performance indicator (KPI) for hip fractures

PUBLIC

- IHFD summary reports
- Increase social media presence i.e. Twitter
- Launch of new NOCA website with IHFD resources

CAPTURING PATIENT PERSPECTIVES

In 2017, I became a member of the IHFD Governance Committee as the Public and Patient Interest (PPI) Representative. As an advocate, I work with people who require additional independent advocacy support in addressing issues encountered across a variety of health and social care settings. As the PPI Representative on the IHFD Governance Committee, I strive to contribute to this audit by highlighting aspects of the patient's experience which are important for the patients and which sometimes get lost when the focus is primarily on the clinical outcomes.

Patients with hip fracture should be supported when possible to understand their clinical condition while in hospital, but raising awareness must go even beyond their hospital stay by encouraging patients and carers to participate in the patient's care and to think about aspects of their situation such as bone health, falls and fracture prevention, treatment/surgery options, and rehabilitation and follow-up care. This is part of delivering the right care to the patients by the right team, at the right time, and in the right setting.

Data collected for this audit are not only of relevance to hospital professionals, but also to patients and the wider public. Every positive aspect captured by this report reflects an improvement in the care received by patients across the 16 participating hospitals nationwide. The key findings show the notable progress made from previous reports, and also signal the areas where improvement is still needed; every one of us has a role to play in this process of hospital culture change.

This next section explains what a hip fracture is and tells the public and patients the causes and who may be at risk of having a hip fracture. It also explains what types of treatment usually happen, and is intended to keep patients and the public more informed and empowered in their care.

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

"Beyond the competition between hospitals in achieving all standards set by this audit and obtaining the financial rewards associated with best practice, what matters most for public & patients is the healthcare professional's efforts, determination & commitment towards delivering "the right care, in the right place, at the right time by the right team"

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

WHAT IS A HIP FRACTURE?

'Hip fracture' is a term used to describe a break or fracture in the upper portion of the thigh bone (femur) where the bone meets the pelvis (Figure 1). It is commonly referred to as a 'fractured neck of femur' or a 'proximal femur fracture'.

ABOUT THE PATIENT

Our skeleton is constantly remodelling itself throughout our lifetime. As we age, our bones can become weaker (osteoporosis). This means that a simple fall from standing height or lower can result in a fracture. A number of factors influence this increased risk of fracture as people age.

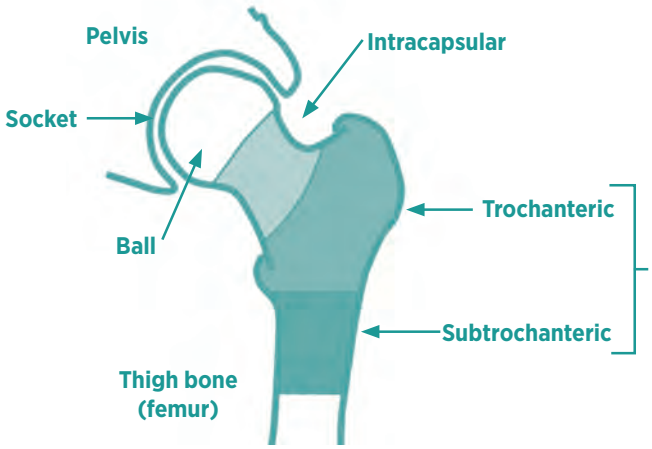
- The leading cause of hip fracture is falls.
- A factor that influences risk of falls is slowing reflexes, meaning that people cannot protect themselves quickly enough to break the fall. This often means that the hip takes the full force of the fall.
- A fracture may be the first sign that bones are weak (osteoporosis) or that a person may be frail. Frailty is a clinical syndrome in older adults that leads to an increased risk of poor health outcomes, including falls, incident disability, hospital admission, and death (Bandeen-Roche et al., 2006).
- Many people who fracture their hips are older, have multiple medical conditions, and have psychological and social problems, making recovery from the operation and rehabilitation a big challenge.

ABOUT THE HIP

The hip joint is made up of a ball and socket joint. The ball (head of the femur) is located on top of the thigh bone and the socket sits within the pelvis. The joint is contained within a fibrous capsule and much of the ball receives its blood supply through blood vessels in the capsule.

- If the fracture occurs within the capsule (intracapsular fracture), the blood supply can be disrupted and fracture healing may be delayed, or the head of the femur may die.
- Fractures outside the capsule (extracapsular fractures) do not have this problem. Fractures outside the capsule can be classified, depending on their location, as intertrochanteric or subtrochanteric fractures.
- The type of operation to fix the fracture will depend on the location of the fracture.

FIGURE 1: ANATOMY OF THE HIP

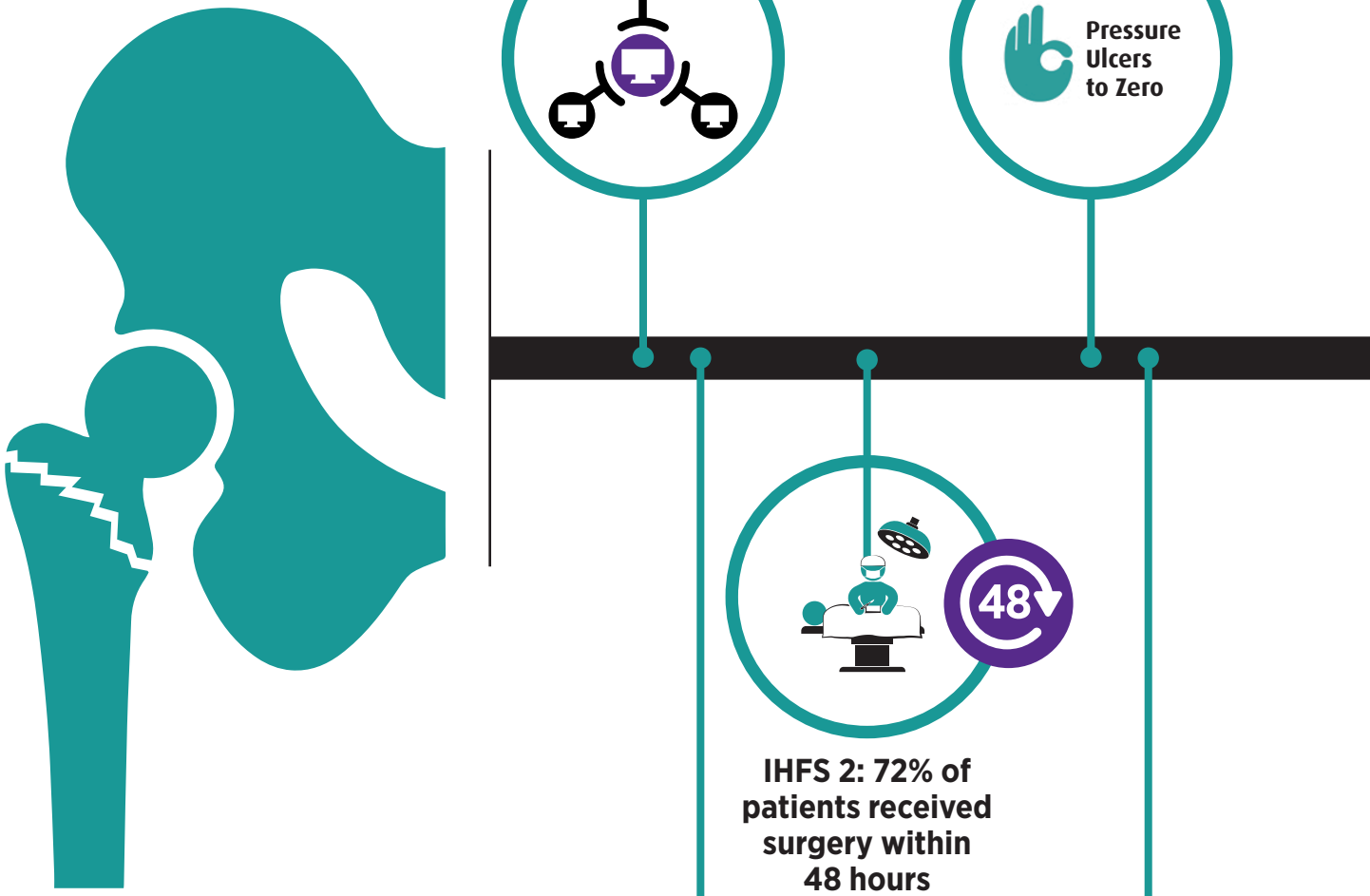


ABOUT THE OPERATION

The pain caused by a hip fracture can be managed with painkillers or injections of local anaesthetic around the nerves in the front of the hip joint, but undoubtedly the best form of pain relief is to fix the fracture as promptly and as safely as possible. In a very small proportion of patients, surgery will not be required if the fracture will heal on its own. Occasionally, a patient may be too medically unwell to operate on. The vast majority of patients will need an operation to allow them to move, walk and regain their independence.

- The most common operation involves removing the broken part of the ball joint and replacing it with a prosthesis (hemiarthroplasty – partial hip replacement), although some people may need a total hip replacement (THR). This is usually performed for intracapsular hip fractures if the bones have separated.
- Extracapsular hip fractures are repaired with a plate screwed to the upper thigh bone, through which a sliding screw is placed into the head of the femur.
- For more complex fractures, and those farther down the thigh bone, a long nail (intramedullary nail) is passed down the inside of the thigh bone.
- The operation can be performed with the patient asleep using a general anaesthetic (GA), or with their pain blocked by an spinal anaesthetic (SA) or an epidural anaesthetic, known as a combined spinal epidural (CSE).

KEY HIGHLIGHTS 2018



Data coverage of 99%

IHFS 3: 3% of patients developed a pressure ulcer after admission

Pressure Ulcers to Zero

48

IHFS 2: 72% of patients received surgery within 48 hours

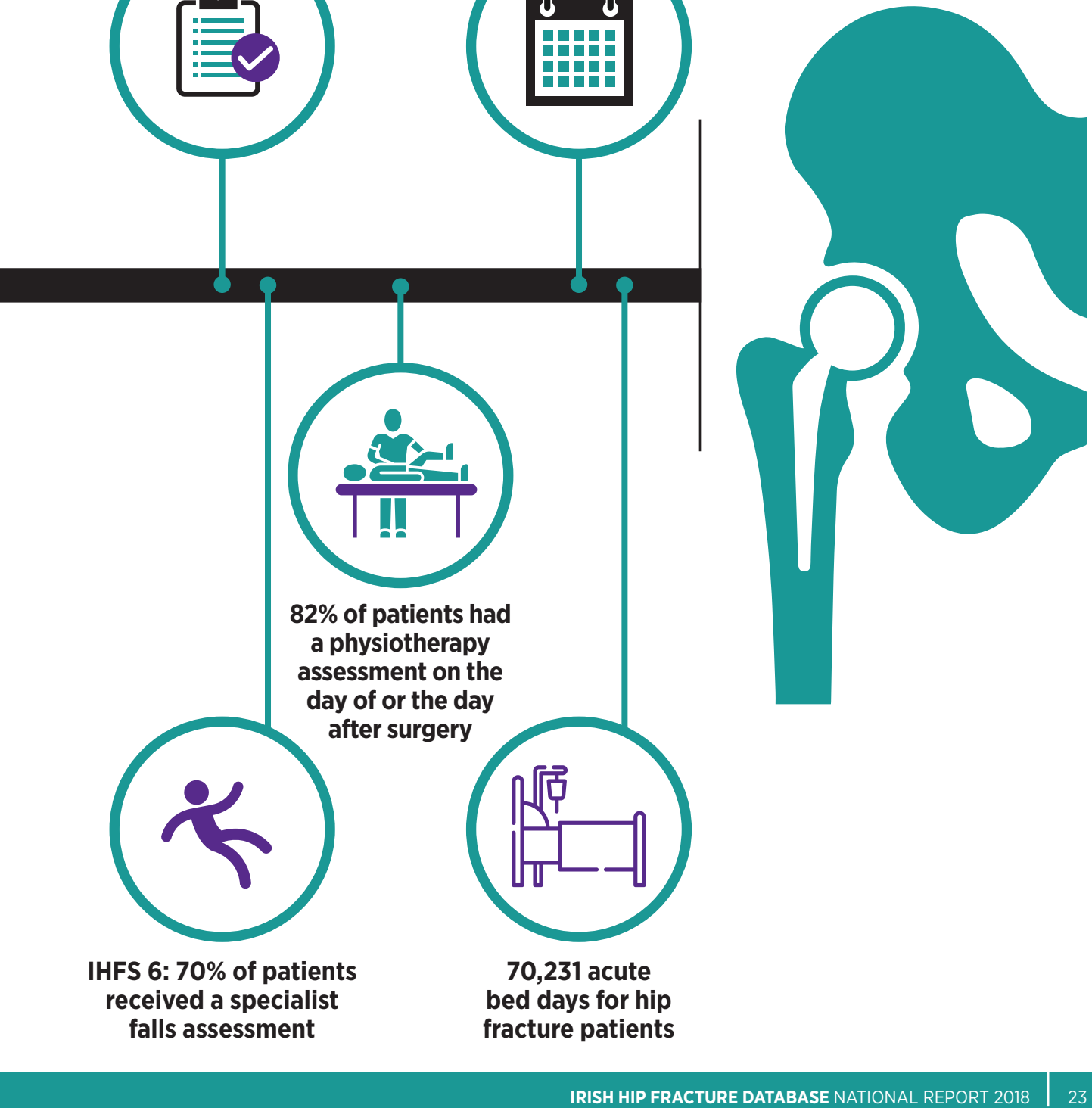
4

IHFS 1: 17% of patients admitted to an orthopaedic ward/theatre within four hours

IHFS 4: 69% of patients seen by a geriatrician

IHFS 5: 84% of patients received a bone health assessment

Median length of stay: 12 days



82% of patients had a physiotherapy assessment on the day of or the day after surgery

IHFS 6: 70% of patients received a specialist falls assessment

70,231 acute bed days for hip fracture patients

CHAPTER 1
INTRODUCTION

CHAPTER 1: **INTRODUCTION**

Hip fractures continue to be the most common serious injury sustained by older people. They are associated with considerable morbidity, mortality and high costs to the health service. They are the most common reason for older people to require emergency anaesthesia and surgery (Torrance *et al*., 2015).

This is the sixth Irish Hip Fracture Database (IHFD) National Report published by the National Office of Clinical Audit (NOCA). The audit has gathered data on almost 18,000 hip fracture cases in Ireland since 2012. In its maturity, the audit is comparable on the international stage with other national hip fracture audits (Johansen *et al*., 2017). The data have influenced key system changes such as the introduction of national bypass for hip fracture, whereby patients are brought directly to a hospital that has an orthopaedic service that can provide surgery instead of to the closest hospital, which may not have that service. This process was led by the Clinical Programme for Trauma and Orthopaedic Surgery in collaboration with the National Ambulance Service (NAS), the Dublin Fire Brigade (DFB), and the Health Service Executive (HSE). The data have also been the key driver for the development of orthogeriatrics in Ireland.

A milestone development in the health service in Ireland and the life of the audit has been the introduction of a Best Practice Tariff (BPT) in 2018. The impact of the BPT appears to be a notable improvement in data quality, clinical governance and performance towards the Irish Hip Fracture Standards (IHFS). The BPT is a payment for hospitals operating on hip fracture patients (aged 60 years and over) who achieve eight standards of care for individual patients. This payment is a performance incentive linked to quality care in the form of the IHFS and data quality standards (Table 2). Tariff-based incentives have been used in other health systems. Metcalfe et al (2019) compared the data from England with that in Scotland, which does not provide BPT payments to hospitals and found that the BPT scheme saved up to 7,600 lives in England between 2010 and 2016. The research also highlights the BPT drove changes in practice that reduced mortality for hip fracture patients in England and led to generally improved standards of care overall and a reduction in readmissions to hospital.

The IHFD enables hospitals to measure their care against defined clinical and governance standards in a transparent way and supports active engagement in quality improvement. International evidence has shown us that the synergy of care standards, audit and feedback drive measurable improvements in hip fracture outcomes for patients, including reduction in mortality (NHFD, 2015). Hip fracture patients often spend a prolonged period in hospital; in 2018, this equated to 70,231 acute bed days. In 2018, there was a slight decrease in the average length of stay from 20 days to 18.7 days, a reduction indicating a saving of approximately 900 bed days from 2017. This is compared to an average length of stay in the United Kingdom (UK) of 15.5 days, of 18.9 days in Wales and 13.5 days in Northern Ireland (NHFD 2018 Report). Fewer than one in five patients regain their pre-fracture functional level before leaving hospital, meaning that the majority of hip fracture patients will have an increased level of dependence and walking difficulties. It is estimated that hip fracture care in acute hospitals cost the health service €45 million in 2018 according to the HPO.

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.

Collaborative care can no longer be an event that sometimes happens; it should be the culture of care for hip fracture patients. There is no single healthcare profession that can manage the care of hip fracture patients in isolation, but there is encouraging evidence that patients' outcomes are improved if there is full collaboration across the many disciplines making up the orthogeriatric team (Brent *et al*., 2018).

In 2018, the 7th Fragility Fracture Network Global Congress was held in the Royal College of Surgeons in Ireland, Dublin, supported by many members of the IHFD Governance Committee and chaired by the Clinical Leads for the IHFD, Dr Emer Ahern and Mr Conor Hurson. The Fragility Fracture Network (FFN) is a global organisation dedicated to harnessing a variety of strategies to tackle what is otherwise going to be the unmitigated disaster of a pandemic of hip and other fragility fractures. In 2018, the FFN published a landmark publication that was endorsed globally by all the leading world organisations involved in fragility fracture care and by the IHFD Governance Committee. The following recommendations for global cooperation and collaboration were made:

- multidisciplinary co-management of the acute fracture episode
- prompt surgery that allows immediate weight-bearing in lower extremities and activities of daily living in upper extremities
- geriatrician-led rehabilitation and discharge planning
- reliable secondary prevention, addressing both bone health and falls risk (Marsh and Palm, 2018).

With the aforementioned recommendations in mind, the IHFD continues to align its purpose to ensuring that patients get the best standard of care. In 2018, 6% of patients who were admitted from home were discharged to long-term care, meaning that they never returned to live in their homes again. This comes at a significant personal and societal cost, in addition to the financial cost to the health service.

The IHFD also welcomes the *Sláintecare Implementation Strategy* that was published by the Irish Government in 2018 which aims to provide "more care at home, or close to home in communities" (Department of Health, 2018).

- The IHFD team will further align our focus, recommendations and work to the Sláintecare programme to improve the quality of hip fracture care for people from home to home, promote health to prevent further falls and fractures, and provide timely access to care: "Right care, Right place, Right time, Right team". We will continue to measure and publish our performance to inform and create a system that works for patients and the changing needs of the population.

Hip fractures continue to be a marker condition for how well people with frailty are managed in the health service. The IHFD Governance Committee, within the structures of NOCA, continues to drive this audit forward in order to ensure that current evidence-based standards of care are measured and reported in an open and transparent way that allows the hospitals involved to continuously evaluate their service and improve. It is hoped that this report will inform and encourage the public, carers, all healthcare staff, and government and non-government organisations to act on the key recommendations and findings in this report. Hip fractures can be prevented with public awareness of bone health and falls prevention, and for patients who do break their hip while still living at home, the system should be able to ensure that these patients go back home again. Hospitals must engage actively with their local data and continue to improve the care they are delivering.

WHO IS THIS REPORT AIMED AT?

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

- patients and carers
- patient organisations
- healthcare professionals
- hospital managers
- hospital groups
- policy-makers.

The report has been designed in three parts:

1. The *Irish Hip Fracture Database National Report 2018* presents our key findings on the IHFDs, BPT, case mix, patient pathway, and outcomes.
2. The *Irish Hip Fracture Database National Report 2018: Summary Report* will be of particular interest to patients, patient organisations and the public.
3. A local hospital report for 2018 comparing each individual hospital with the *Irish Hip Fracture Database National Report 2018* has been issued to the individual hospitals in advance of the publication of the national report.

AIM AND OBJECTIVES

The focus of the audit continues to be on collecting high-quality data and using these data for quality improvement.

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.

OBJECTIVE 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; and accessibility and clarity (Health Information and Quality Authority, 2018).

OBJECTIVE 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.

OBJECTIVE 3

Disseminate the findings from the data in a timely manner and report any data or performance concerns back to the relevant stakeholders.

OBJECTIVE 4

Support/promote the use of IHFD data for improvement of care at local and national level.

OBJECTIVE 5

Benchmark hip fracture care and outcomes nationally and internationally.

OBJECTIVE 6

Support high-quality data provision for research.

OBJECTIVE 7

Collect longer-term outcome data.

OBJECTIVE 8

Support the BPT hip fracture payment.

OBJECTIVE 9

Be the primary data source for hip fracture key performance indicator (KPI).

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
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: Suzy O'Donnell
IHFD AUDIT COORDINATOR: Orla Duggan
IHFD CLINICAL LEAD: Mr. Derek Bennett

UNIVERSITY HOSPITAL GALWAY

IHFD AUDIT COORDINATOR: Aoife Dempsey
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: Dr Jude Ryan
IHFD CLINICAL LEAD: Mr Finbarr Condon

UNIVERSITY HOSPITAL KERRY

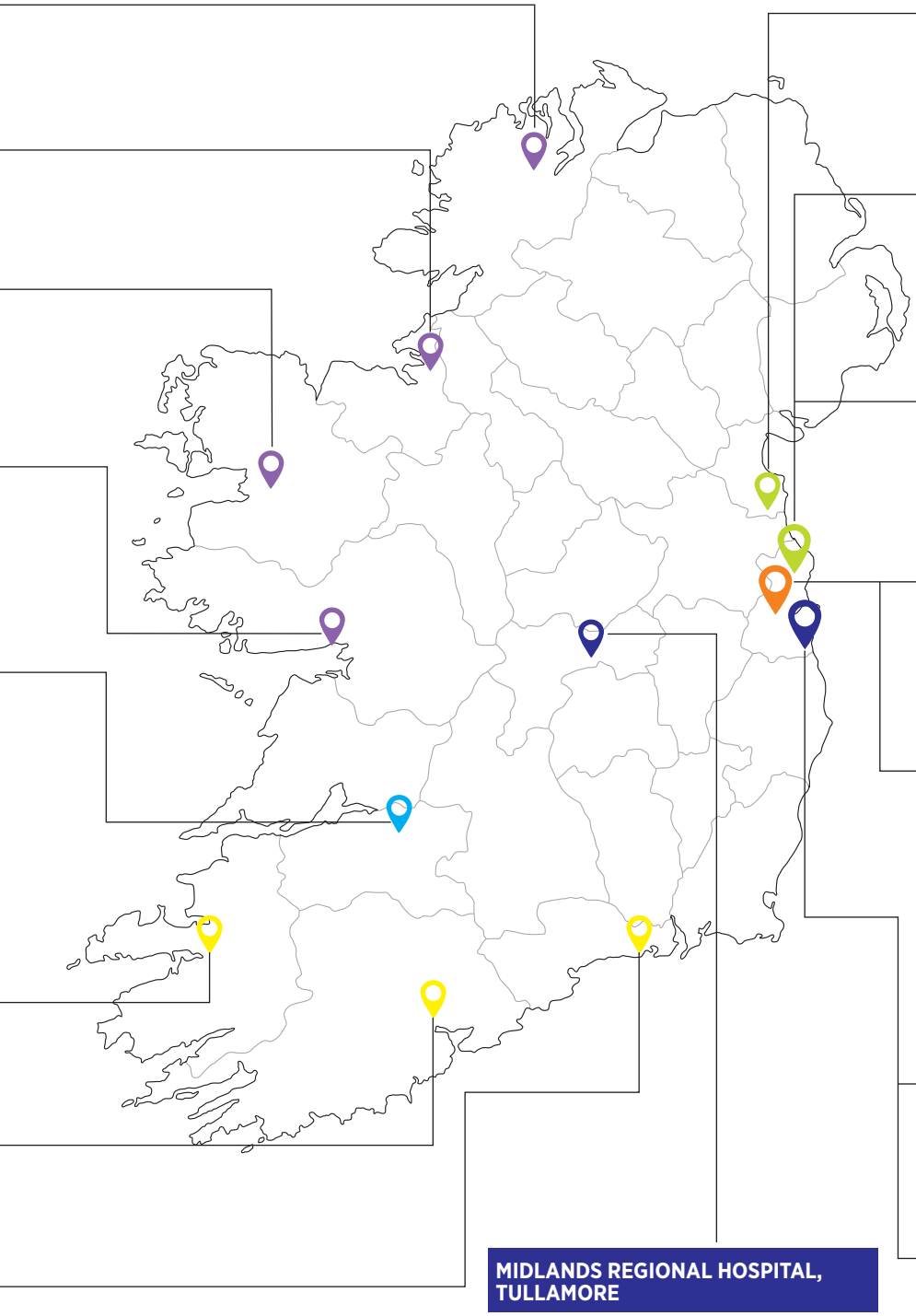
IHFD AUDIT COORDINATOR: Esther O'Mahony
IHFD CLINICAL LEAD: Mr John Rice

CORK UNIVERSITY HOSPITAL

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

UNIVERSITY HOSPITAL WATERFORD

IHFD AUDIT COORDINATOR: Lorraine Smith
IHFD AUDIT COORDINATOR: Gavin Egan
IHFD CLINICAL LEAD: Mr Terrence Murphy



OUR LADY OF LOURDES HOSPITAL, DROGHEDA

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

BEAUMONT HOSPITAL

IHFD AUDIT COORDINATOR: Anthony O'Loughlin
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

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: Ricardo Paco
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

CHAPTER 2
METHODOLOGY

CHAPTER 2: **METHODOLOGY**

The IHFD collects data on hip fracture patients (aged 18 years and over) through a portal on the Hospital In-Patient Enquiry (HIPE) system in collaboration with the Healthcare Pricing Office (HPO). The reference population for the national report focuses only on patients aged 60 years and over. Data from the HIPE system, such as age, gender, admission source, etc., are merged with additional IHFD data. An extract of data for the national report is sent to NOCA from the HPO, with the cases anonymised.

INCLUSION CRITERIA

Analysis is based on records as captured on the Hospital In-Patient Enquiry (HIPE) IHFD Portal software. It includes cases that were:

(i) discharged between 1 January 2018 and 31 December 2018, inclusive (the HIPE data file used was 2018_V17, extracted on 12 April 2019)

(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

(iii) aged 60 years or over.

EXCLUSION CRITERIA

(i) Patients aged 59 years or younger are excluded.

(ii) 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 ENTRY

Each hospital has an audit coordinator and a clinical lead, and should have a hip fracture governance committee. The audit coordinator enters data through the Hospital In-Patient Enquiry (HIPE) IHFD Portal in the individual hospital. A list of cases eligible for inclusion is identified by running a HIPE Discharge Report in the Hospital In-Patient Enquiry (HIPE) IHFD Portal. Additional cases may be identified manually. Most data are entered retrospectively and in accordance with the data collection targets (Table 2.1).

TABLE 2.1: DATA COLLECTION CALENDAR 2018

Data collection period	Data entry target	Data reporting date
01/01/2018–31/03/2018	30/06/2018	11/07/2018
01/04/2018–30/06/2018	30/09/2018	18/10/2018
01/07/2018–30/09/2018	31/12/2018	31/01/2019
01/10/2018–31/12/2018	31/03/2019	18/04/2019

DATA ANALYSIS

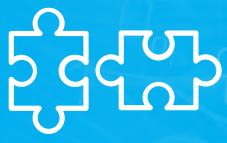
The data extract was received by NOCA on 12 April 2019 and analysis was completed by the NOCA Biostatistician following data checks with the HPO. The analysis was conducted using Statistical Package for the Social Sciences (SPSS) V25.

CHAPTER 3
DATA QUALITY

Relevance

Accuracy and reliability

Timeliness and punctuality



Coherence and comparability

Accessibility and clarity

CHAPTER 3: **DATA QUALITY**

DATA QUALITY STATEMENT

The purpose of the data quality statement (Table 3.1) is to highlight the assessment of the quality of the IHFD 2018 data using internationally agreed dimensions of data quality as laid out in *Guidance on a data quality framework for health and social care* (HIQA, 2018). An overview of the aim and objectives of the IHFD data collection is included in Chapter 1, and the IHFD data source description is detailed in Chapter 2. The data quality statement identifies strengths and areas for improvement, e.g. creation of a coverage standard for the BPT and the data collection calendar. An overview of the assessment of the IHFD against the dimensions of data quality is presented in Table 3.1.

TABLE 3.1: OVERVIEW OF DATA QUALITY FOR THE IHFD 2018

Dimensions of data quality	Definition (HIQA, 2018)	Assessment of dimension (IHFD)
RELEVANCE	**Relevant data meet the current and potential future needs of users.**	The IHFD updates the dataset annually to ensure that all data fields are relevant to the audit. Dataset changes discussed at the final IHFD Governance Committee meeting on 10 December 2018 were implemented from 1 January 2019. for the new reporting year (2019). Monthly teleconferences, and the annual IHFD workshop with the audit coordinators, enable any new data fields to be discussed and piloted. In 2018, the IHFD introduced the 4AT (rapid clinical test for delirium), pre-operative nerve block, and malnutrition screening data fields. This will be reported on in the IHFD National Report 2019. All data fields are reported on in the national report and in local hospital annual reports. At hospital level, additional fields that may be relevant to that specific hospital can be added for local use only. In 2018, one research request was received and granted to examine national IHFD data from 2013–2017 and evaluate patient characteristics and patterns of care to determine their influence on patient outcomes. The first substantial piece of work has been completed examining predictors of in-hospital mortality in an Irish hip fracture population. This was undertaken by Professor Tara Coughlan, Dr Helena Ferris and Louise Brent, with support from the HSE National Quality Improvement Team. The findings, which are expected to be published by the end of 2019 highlight that older patients, males, patients with poor pre-fracture mobility and those who are not mobilised on day one after surgery have the highest rate of inpatient mortality. Feedback on the relevance of the data is sought through interactions with other organisations such as the HPO, the HSE Business Intelligence Unit (BIU) and researchers. Regular meetings took place in 2018 in fulfilment of this. In 2018, the introduction of the BPT enforced the requirement to enter 90% of data in the relevant reporting quarter.
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 IHFD collects data on hip fracture patients (aged 18 years and over) through a portal in the HIPE system in collaboration with the HPO. The reference population for the national report focuses only on patients aged 60 years and over. The coverage for the reference population has been reported at hospital level since 2016 in the annual national report, and quarterly to the hospitals and Hospital Groups. The expected standard is a minimum of 90% coverage. In 2018, all hospitals achieved above the 90% coverage target with the final national coverage being 99%. Ten hospitals achieved 100% coverage. In 2018, as part of the BPT, 90% data coverage was included as a standard for the tariff. Each hospital must achieve a minimum of 90% data entry coverage for the relevant reporting quarter as well as annually. NOCA collaborates with data users and the HPO to improve data entries that are duplicates or that have missing or incorrect data. A more robust validation process is currently being developed by the NOCA data analytical team and the HPO. Regular data validation reports (DVRs) will be sent to the hospitals in 2019 to check their data.

Dimensions of data quality	Definition (HIQA, 2018)	Assessment of dimension (IHFD)
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% of data per reporting quarter. The timeliness of submissions per quarter for 2018 was as follows: Quarter 1: 97%, Quarter 2: 92%, Quarter 3: 97%, and Quarter 4: 98%. The overall timeliness of the data submissions the end of the reporting deadline was 99%. These data are processed and reported (released) to hospitals within two to three weeks of the end of the reporting quarter, one quarter in arrears. The IHFD reporting calendar is provided in Chapter 2, Table 2.1. These reports highlight the national coverage versus the individual hospital coverage in relation to the data collection target and compliance with the IHFS and BPT. Data entry targets are reviewed quarterly at each IHFD Governance Committee meeting. The final data entry date is linked to the HIPE closure date for the reporting year and is updated annually. The closing date for data entry for 2018 was 31 March 2019. The NOCA monitoring and escalation policy details the process of escalation. In 2018, all hospitals met the annual target of 90% data coverage. Any hospitals which were not meeting the quarterly targets were engaged with by the IHFD Audit Manager in an informal way to support them to achieve the targets. The quarterly reports for 2019 are being improved based on feedback and review of the 2018 reports in order to further enhance the quality of these reports.
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 clinical hip fracture care standards with the addition of a data quality and clinical governance standard for the BPT. Data are collected using national and international classifications, including International Classification of Diseases, Tenth Revision (ICD 10) and American Society of Anesthesiologists (ASA) classifications. The data definitions and metadata information are included in the appendices of the report. The IHFS are evidenced-based clinical standards for care derived from the international literature and are comparable with other international hip fracture registers. In 2017, the IHFD data were compared in an international publication alongside seven other hip fracture registers (Johansen *et al*., 2017). In 2018, data extracts for IHFS 2 were sent quarterly to the BIU for comparison with the national KPI for hip fractures. In 2019, IHFD data will become the primary source of data for the KPI.
ACCESSIBILITY AND CLARITY 	**Data are easily obtainable and clearly presented in a way that can be understood.**	The local Hospital In-Patient Enquiry (HIPE) IHFD Portal has inbuilt definitions for each data field at the point of data entry. There are several 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. All national IHFD reports are available for download on the NOCA website (www.noca.ie), along with key documents relevant to the audit such as publications, IHFD statement of purpose, the IHFD handbook, and national and summary reports. Ongoing work is underway to update the IHFD data dictionary in line with Health Information and Quality Authority (HIQA) standards.

DATA COVERAGE

The final dataset used for this report includes 3,751 cases from 16 participating hospitals, with the number of cases per hospital ranging from 115 to 455. 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 which meet the inclusion criteria detailed in Chapter 2. The coverage for 2018 is representative of all HIPE hip fracture cases coded with additional IHFD data for the 16 participating hospitals for the reference population highlighted in Chapter 2. This was calculated at 99%, an increase of four percentage points from the 95% reported on for 2017. Individual hospital coverage ranges from 95% to 100%.

99% coverage of hip fracture patients in 2018

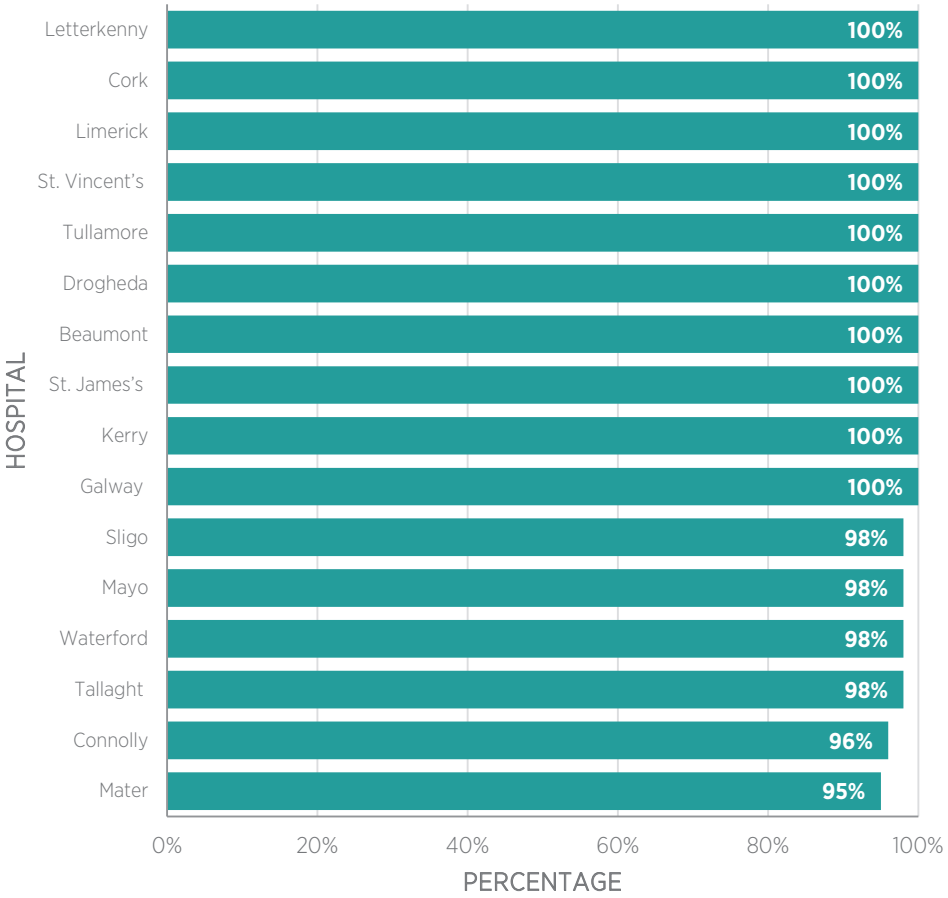
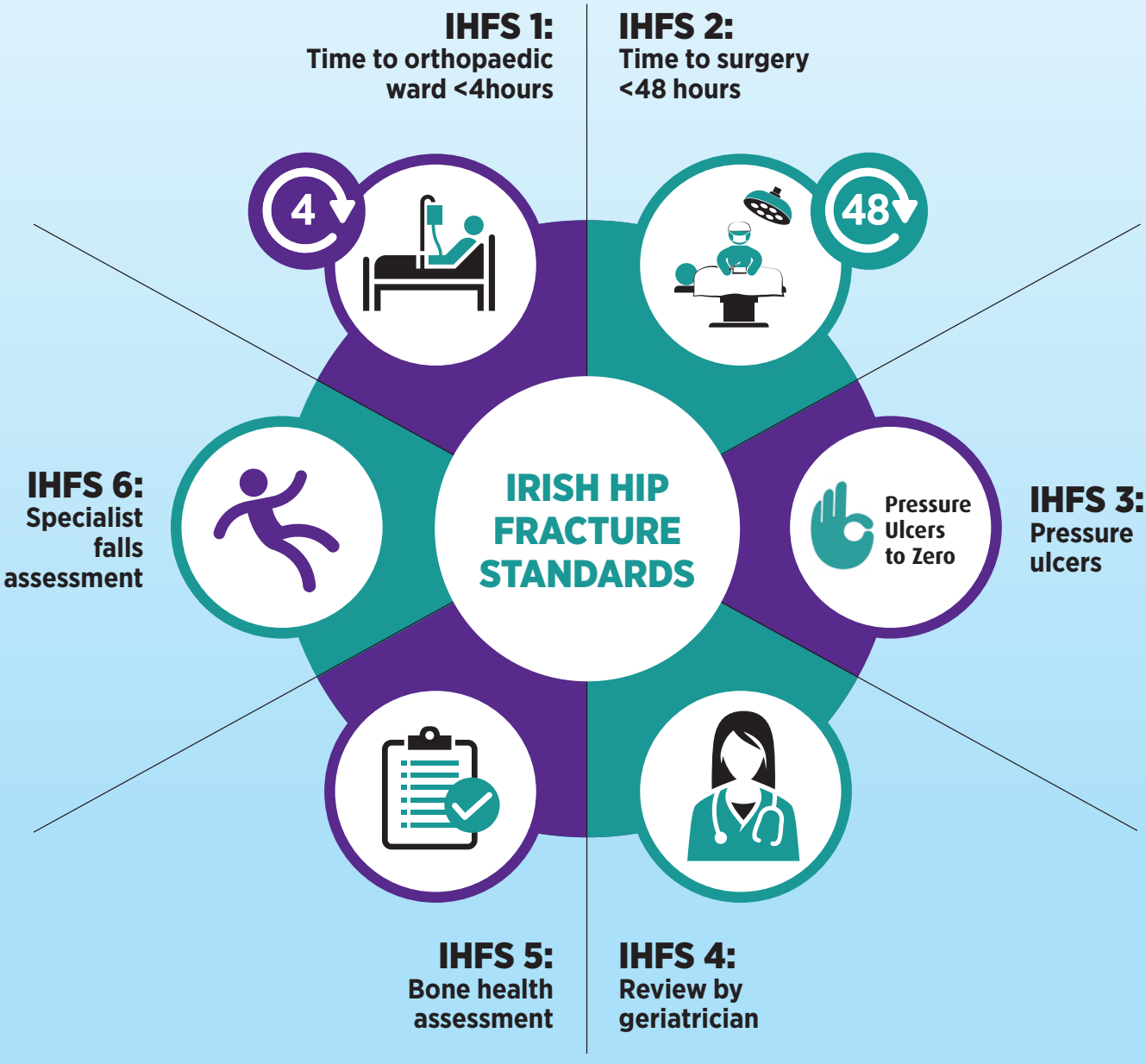


FIGURE 3.1: COVERAGE PERCENTAGES PER HOSPITAL

CHAPTER 4

IRISH HIP FRACTURE STANDARDS AND BEST PRACTICE TARIFF



CHAPTER 4: IRISH HIP FRACTURE STANDARDS AND BEST PRACTICE TARIFF

This chapter focuses on the individual hospitals' performance across the six IHFS for clinical care. Each IHFS includes a figure showing the hospitals' performance for 2017 and 2018. This information is intended to allow hospitals to benchmark their individual performance against their previous performance and against other hospitals' performance.

Overall, national improvements have been made in five out of the six standards since 2017 (Figure 4.1), with considerable improvements being made in IHFS 4 (patients reviewed by a geriatrician) and IHFS 6 (patients receiving a specialist falls assessment).

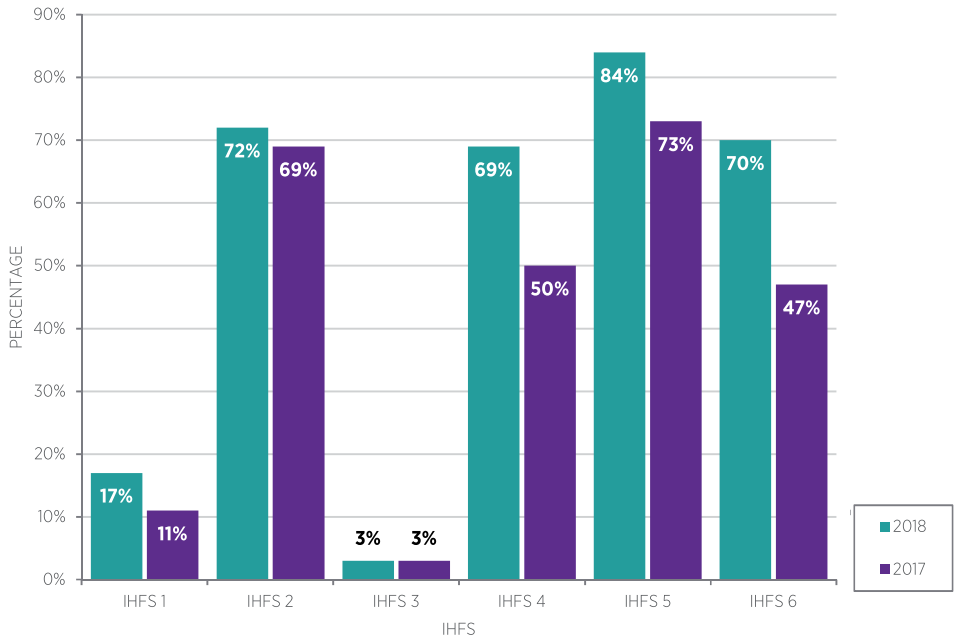


FIGURE 4.1: PERCENTAGE OF PATIENTS NATIONALLY WHO MET EACH IHFS IN 2017 (N=3497) AND 2018 (N=3751)

IHFS 1

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

In 2018, 91% (n=3430) of patients were admitted to an orthopaedic ward, but only 17% (n=637) were admitted to a ward within four hours or were admitted to the theatre from the emergency department (ED) within four hours (Figure 4.2). The median time for admission from the ED to an orthopaedic ward in 2018 was seven hours. For cases admitted via the ED, the time interval is calculated from the time of first arrival at the ED, whether in the first presenting hospital or in the operating hospital. In 2018, the proportion of patients who met this standard at the individual hospital level ranged from 1% to 43%.

Although compliance with this standard continues to be low, this still represents an improvement nationally compared with 2017, when only 11% (n=389) of patients met this standard. Despite this, only six hospitals made any improvements in 2018 compared with their performance in 2017. There is an ongoing challenge for hospital EDs to manage the volumes and complexities of patients presenting to the hospital. In hospitals where there is a particular priority or alert assigned to hip fractures, more patients are meeting this standard. A lot of work is required in order to address this issue nationally and locally.

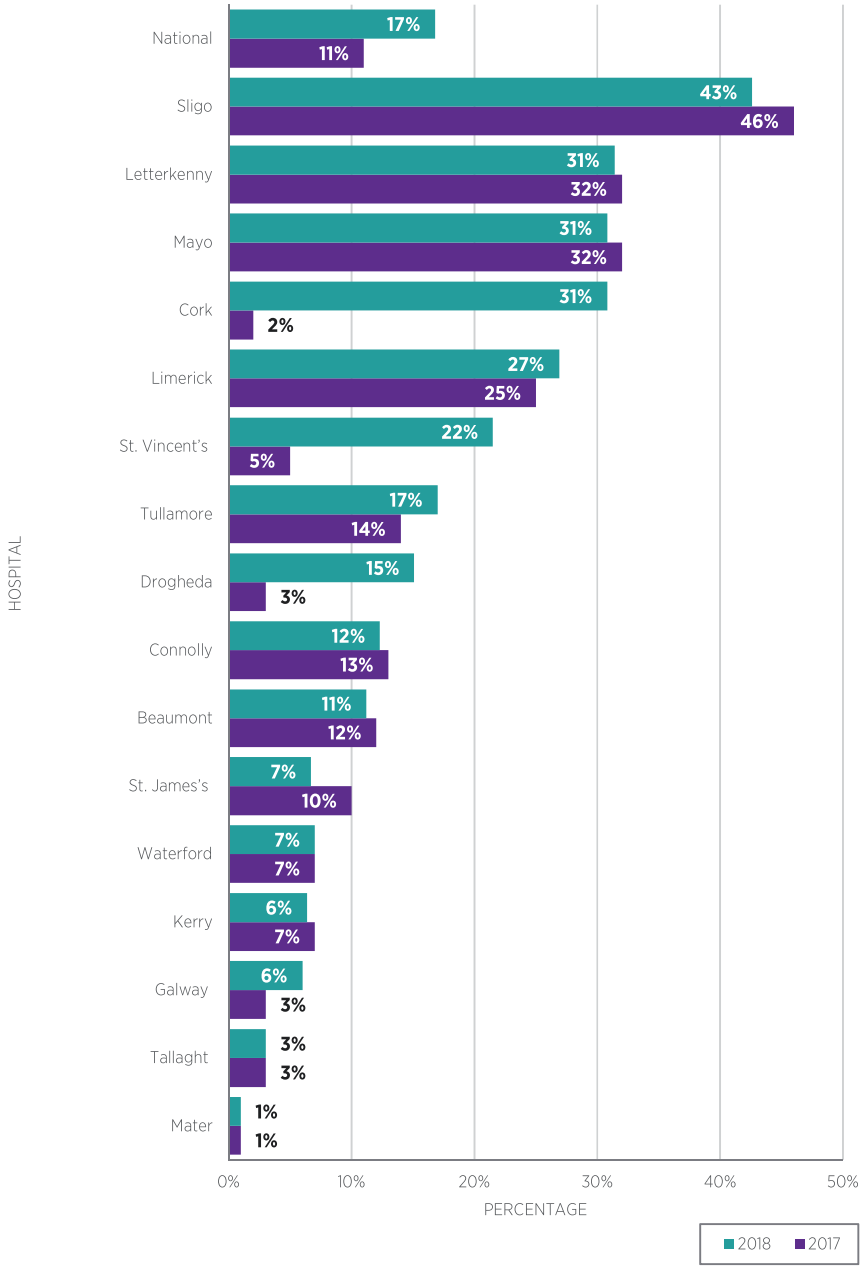


FIGURE 4.2 IHFS 1: PERCENTAGE OF PATIENTS ADMITTED FROM THE ED TO AN ORTHOPAEDIC WARD WITHIN FOUR HOURS OR ADMITTED TO THEATRE FROM ED WITHIN FOUR HOURS, BY INDIVIDUAL HOSPITAL 2017 (N=3497) AND 2018 (N=3751)

CORK UNIVERSITY HOSPITAL (CUH)

This section is intended to illustrate an example of service improvement in relation to IHFS 1.

Cork University Hospital (CUH) is one of the busiest trauma centres in Ireland. In 2018, 467 hip fracture patients aged 60 years and over required surgery. These amounted to 8% of all trauma patients. An Orthopaedic Service Working Group was formed in CUH to review the service. The primary focus of the group was to develop a Quality Improvement Plan (QIP) for the full pathway of care for patients presenting to the orthopaedic trauma service within CUH, from pre-admission through to the ED and to discharge. The work of the group reflected on the following:

- *Irish Hip Fracture Database National Report 2017*
- The National Trauma and Orthopaedic Clinical Programme
- Recommendations from the Lean 6 Sigma Review
- National Quality Assurance information System (NQAIS)
- Submissions from the CUH Department of Orthopaedics.

The group agreed to set up three work streams: 1) patient presentation to and flow through the ED, 2) inpatient flow, and 3) interface with the operating theatre and discharge, including patient follow-up.

For the purpose of this example of service improvement, a focus will be put on work stream 1 (IHFS 1: four hours for admission to orthopaedic ward):

- Admission to an orthopaedic ward within four hours was only 2% in CUH in 2017, and the national average was 11% in 2017.
- Within work stream 1, a subgroup was formulated to adopt a standardised admission to fast-track hip fracture patients in order to meet IHFS 1.
- The trauma floor was adapted to become a centralised hub for orthopaedic patients, increasing capacity from 25 to 50 beds, including a designated "Hip Bed".
- "Code Hip Bleep" was introduced after discussion with the paramedic lead. The ambulance personnel will alert ED staff when a suspected hip fracture is en route to the ED.

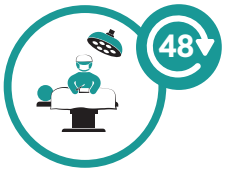
This increased awareness of priority for this group of patients, coupled with the improved communication throughout the pathway of care from pre-hospital to ED and the ward, had a significant impact.The percentage of patients admitted to an orthopaedic ward within four hours has risen to 31%.

The Department of Orthopaedics continues to strive to enhance our patient pathways with the introduction of "Code Hip Bleep. This system will be initiated in the coming months and will raise the focus and priority given to hip fracture patients. Ultimately, the focus of the Orthopaedic Service Working Group will continue to be on:

- improving patient outcomes
- achieving compliance with all IHFS
- aiding patient flow in reducing length of stay
- amalgamating all trauma patients on a trauma floor
- maintaining a designated hip bed.

From left to right: Caroline Costello CNM2 Trauma Floor, Stanley Varghese SHO, Leetha Gokul Occupational Therapist, Eoin Campbell Physiotherapist, Dr Emer Ahern Consultant Orthogeriatrician, David Brown Intern, Hareesh Nair Intern, James Nolan Orthogeriatric Registrar, Toni O'keeffe Orthopaedic Trauma Coordinator

IHFS 2



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

72% of surgeries were conducted within 48 hours and within normal working hours

In 2018, surgery was carried out on 95% (n=3554) of patients who presented with a hip fracture. Analysis indicates that 72% (n=2561) of those surgeries were conducted within 48 hours and during normal working hours (Monday to Sunday, 08.00–17.59) (Figure 4.3) and 2% (n=60) were conducted within 48 hours but outside of normal working hours. The median time to surgery was 27 hours. The proportion of patients whose management of care met this standard at the individual hospital level ranged from 52% to 95%. The variance in individual hospital performance is concerning, as surgery for these patients is the single most important intervention. There was, however, an increase in the proportion of cases meeting this standard in 10 hospitals between 2017 and 2018.

In 2018, 55% (n=1940) of surgeries were carried out by a consultant orthopaedic surgeon and 27% (n=965) were carried out by a specialist registrar (see Appendix 5).

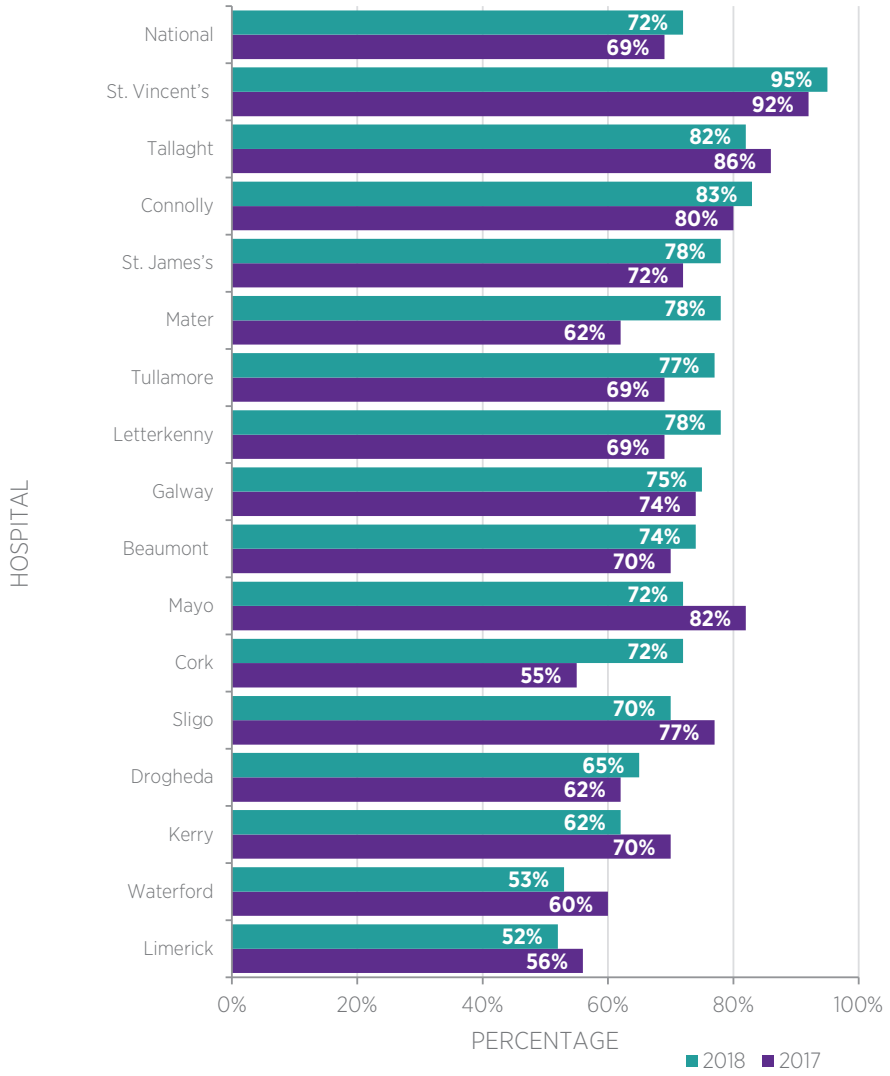


FIGURE 4.3 IHFS 2: PERCENTAGE OF PATIENTS RECEIVING SURGERY WITHIN 48 HOURS (AND WITHIN NORMAL WORKING HOURS) BY INDIVIDUAL HOSPITAL, IN 2017 (N=3336)[1] AND 2018 (N=3554)[2]

[1] 161 patients did not have surgery in 2017
[2] 197 patients did not have surgery in 2018

MATER MISERICORDIAE UNIVERSITY HOSPITAL

This section is intended to illustrate an example of service improvement in relation to IHFS 2.

The Mater Misericordiae University Hospital (MMUH) is a model 4 teaching hospital based in Dublin's north inner city. In addition to local services, MMUH provides a range of front line and specialist services on a regional and national level including the National Spinal Injuries Unit, the National Department Cardiothoracic Surgery and Heart and Lung Transplantation, National Isolation Hospital, Infectious diseases, and extracorporeal life support.

The orthopaedic service consists of 10 orthopaedic surgeons (6 spinal and 4 trauma – 2 full time, 2 part time), 5.5 specialist registrars/registrars, 6 senior house officers and 3 interns. The unit has a 25-bed orthopaedic ward and a dedicated spinal unit. It has a multidisciplinary team consisting of nurses, specialist nurses, physiotherapists, social workers, an orthogeriatric team and a dedicated audit coordinator to capture the data for the IHFD. In 2018 the team endeavoured to address a number of IHFS, including IHFS 2 (time to surgery).

We identified several problems that were affecting our ability to get patients to theatre on time, including timing through the ED, access to orthopaedic beds, access to theatre, and competing demands from the spinal unit. We identified that improved communication could help the full pathway of care and alert all of the team early in the patient's journey. We implemented an electronic messaging solution called MedX Note. This is a group messaging mobile phone application. We set up a group that would receive an alert when a hip fracture patient arrives. This group included the orthopaedic team, anaesthetic team, nursing team, ED and patient flow. When a patient with a hip fracture presented to the ED, a message was sent to everyone in this group, thus streamlining the communication process.

This improvement in communication has led to significant benefits not only in terms of transferring patients to an orthopaedic bed but also in terms of transferring patients to theatre on time. Since the implementation of this messaging service, we have been able to improve our performance on IHFS 2 from 62% in 2017 to 78% in 2018.

From left to right: Professor Joe Duggan - Consultant Geriatrician & IHFD clinical lead, Ray Gunapala - Data manager orthopaedics & IHFD audit coordinator, Megan Cleary – Senior physiotherapist, Eva Gaynor – Registrar lecturer, Laura Morrison – SpR orthopaedics, Mary Mullen – candidate ANP gerontology, Mary Cleary - CNM 2, Ruth Buckley- Quality manager

IHFS 3

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

Of those patients who were discharged in 2018, 3% (n=101) developed a pressure ulcer following admission (Figure 4.4). The proportion of patients who had a pressure ulcer at the individual hospital level ranged from 0% to 12% in 2018. There has been an increase in the proportion of patients developing a pressure ulcer in six of the 16 participating hospitals since 2017; four hospitals made improvements in this area, and six hospitals performed the same in 2018 as in 2017. The proportion of patients who developed pressure ulcers in St James's Hospital and Beaumont Hospital in 2017 and 2018 are significantly higher than the national average and should be reviewed by their respective hip fracture governance committees (HFGCs). Both hospitals should make it their priority to focus on methods of reducing pressure ulcers within this cohort of patients.

A multidisciplinary approach to pressure ulcer care should be used, including nursing principles of pressure ulcer prevention such as Pressure Ulcers to Zero (PUTZ) (Health Service Executive Quality and Patient Safety Directorate, 2018), early mobility, and nutritional assessment. 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. The IHFD has put a lot of focus on pressure ulcers by providing education to the IHFD Audit Coordinators to ensure that data collection for this standard is accurate. Two education masterclasses provided by Professor Zena Moore from the Royal College of Surgeons in Ireland in 2017 and 2018, as well as the participation of the hospitals nationally in the PUTZ collaborative, have led to assurance that these data are reliable.

There has been an improvement in pressure ulcer incidence in 4 participating hospitals

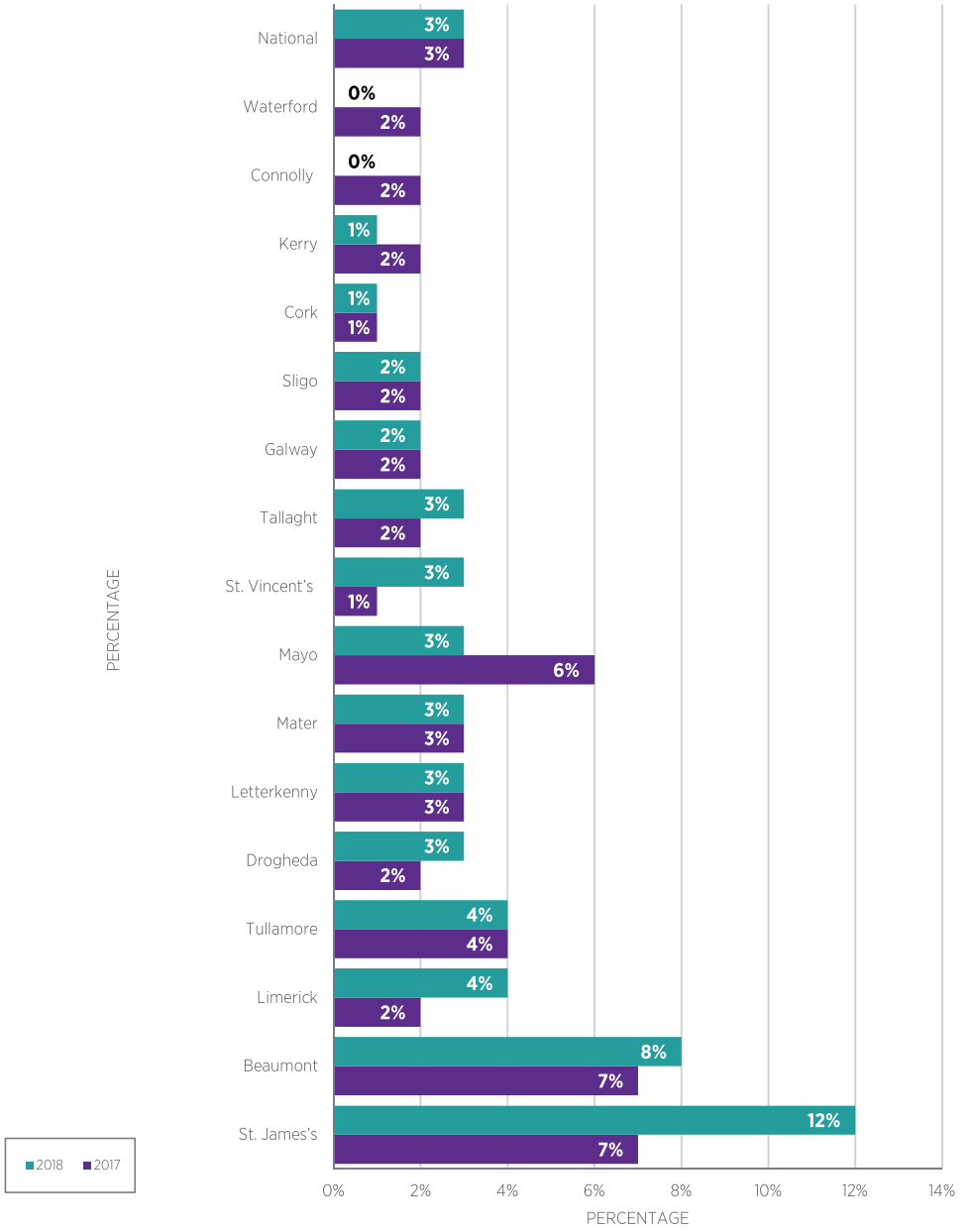


FIGURE 4.4 IHFS 3: PERCENTAGE OF PATIENTS WHO DEVELOPED PRESSURE ULCERS FOLLOWING ADMISSION, BY INDIVIDUAL HOSPITAL, IN 2017 (N=3320)[3] AND 2018[4] (N=3567)

[3] 177 patients who died in 2017 have been excluded from this analysis.
[4] 184 patients who died in 2018 have been excluded from this analysis.

MAYO UNIVERSITY HOSPITAL

This section is intended to illustrate an example of service improvement in relation to IHFS 3.

Mayo University Hospital (MUH) is a general hospital in Castlebar which is managed by Saolta University Health Care Group. The orthopaedic ward has 32 beds for inpatients; these beds are a mixture of elective and trauma beds. Day cases such as injections and epidurals also attend the ward. On average, there are approximately 140-150 patients with a hip fracture attending the unit. The outpatient service has three trauma and three elective clinics.

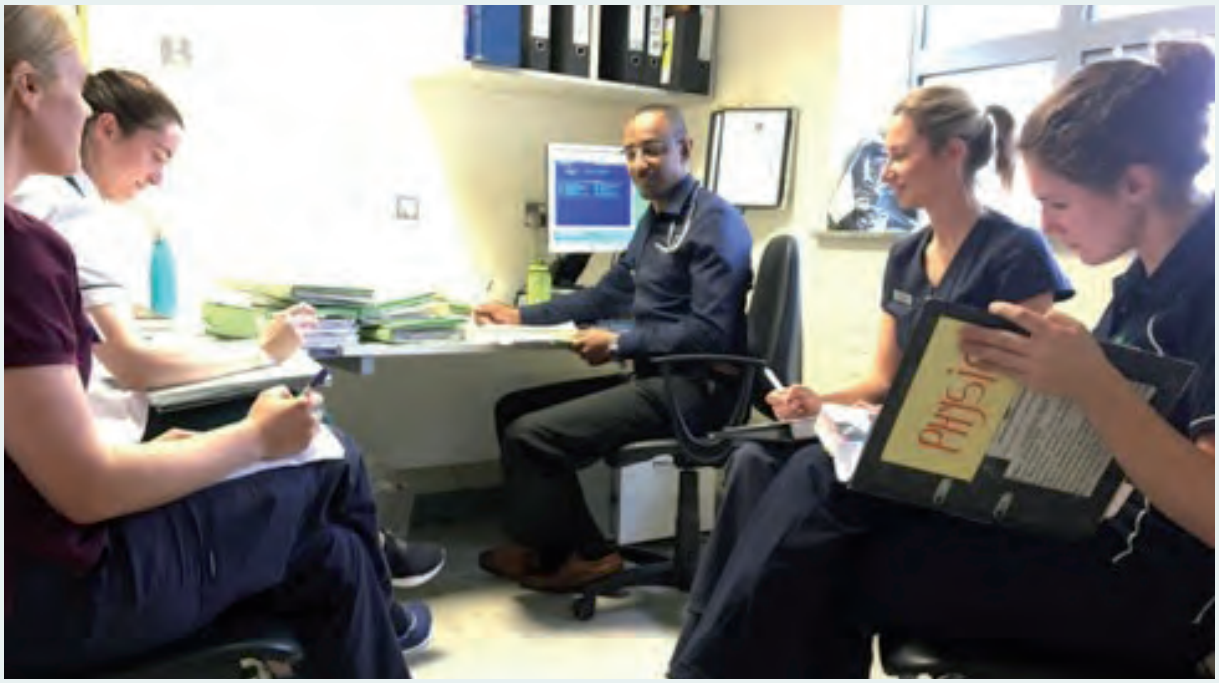
In 2016 and 2017, MUH was identified as an outlier for not entering enough data. During 2018, an audit coordinator was appointed, and during that year MUH achieved above the expected data coverage target of 90%. A multidisciplinary group (including nurses, occupational therapists, physiotherapists and ward-based pharmacists) meets daily to discuss the patients, and once a week the geriatrician and advanced nurse practitioner (ANP) candidate join this meeting.

In 2017, the pressure ulcer incidence in MUH was 6%. To reduce this incidence, the SSKIN Bundle was introduced. SSKIN Bundle assessment includes the following elements: Surface, Skin condition, Keep moving, Incontinence, Nutrition (Gibbons *et al.,* 2006). This bundle was used in conjunction with the Waterlow Assessment for pressure ulcer risk assessment and the Malnutrition Universal Screening Tool (MUST) (Elia, 2003), and at-risk patients were highlighted quickly.

With the three above assessment tools used on admission, nursing staff were able to introduce pressure-relieving measures. These include prompt ordering, receipt and application of pressure-relieving mattresses and heel suspension devices. Conducting SSKIN Bundle assessments every eight hours ensured any changes to skin areas at risk were identified and action taken.

A high percentage of heel pressure ulcers were identified in 2017. Education on documentation, particularly with newly qualified staff and with new staff members and allied health professionals, has been instrumental in helping us achieve this reduction.

In summary, early assessment using identification tools, prompt action, and continuous assessment and education enabled us to halve the pressure ulcer incidence over a one-year period.



From left to right: Karen McHugh, candidate Advanced Nurse Practitioner for older persons, Sinead Coen, Occupational therapist, Dr. Muataz Elnasri, Medical registrar, Triona Dolan-Kirrane, CNM 1 orthopaedics, Maria Mulchrone, Senior physiotherapist

IHFS 4

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

69% of patients were reviewed by a geriatrician during their acute hospital stay

Figure 4.5 shows that nationally, 69% (n=2589) of patients were reviewed by a geriatrician at some time during their acute stay in 2018. This represents a significant improvement of 19 percentage points from 2017. In addition, 26% (n=966) were seen pre-operatively compared to 15% in 2017. Sixty-eight percent (n=1761) of these reviews were carried out by a consultant geriatrician (Appendix 5). Since 2016, the IHFD has been using data to highlight the need for orthogeriatric services in each of the 16 participating hospitals, and this has been a key recommendation for the last two national reports. The IHFD has been recognised as a key driver in the development of orthogeriatrics in Ireland. As of mid-2019, there are now orthogeriatric services in more than 80% of the hospitals participating in the IHFD audit.

The proportion of patients who met this standard at the individual hospital level in 2018 ranged from 3% to 99%. Although 12 of the 16 hospitals made improvements on their 2017 performance, there is still a large variation in the proportion of patients being seen by a geriatrician at individual hospital level. In three hospitals, just over one-third of patients met this standard. The performance of these hospitals in relation to this standard needs to be improved considerably.

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, a reduced requirement for rehabilitation and duration of same, and fewer patients being discharged into long-term care (Shanahan *et al*., 2016).

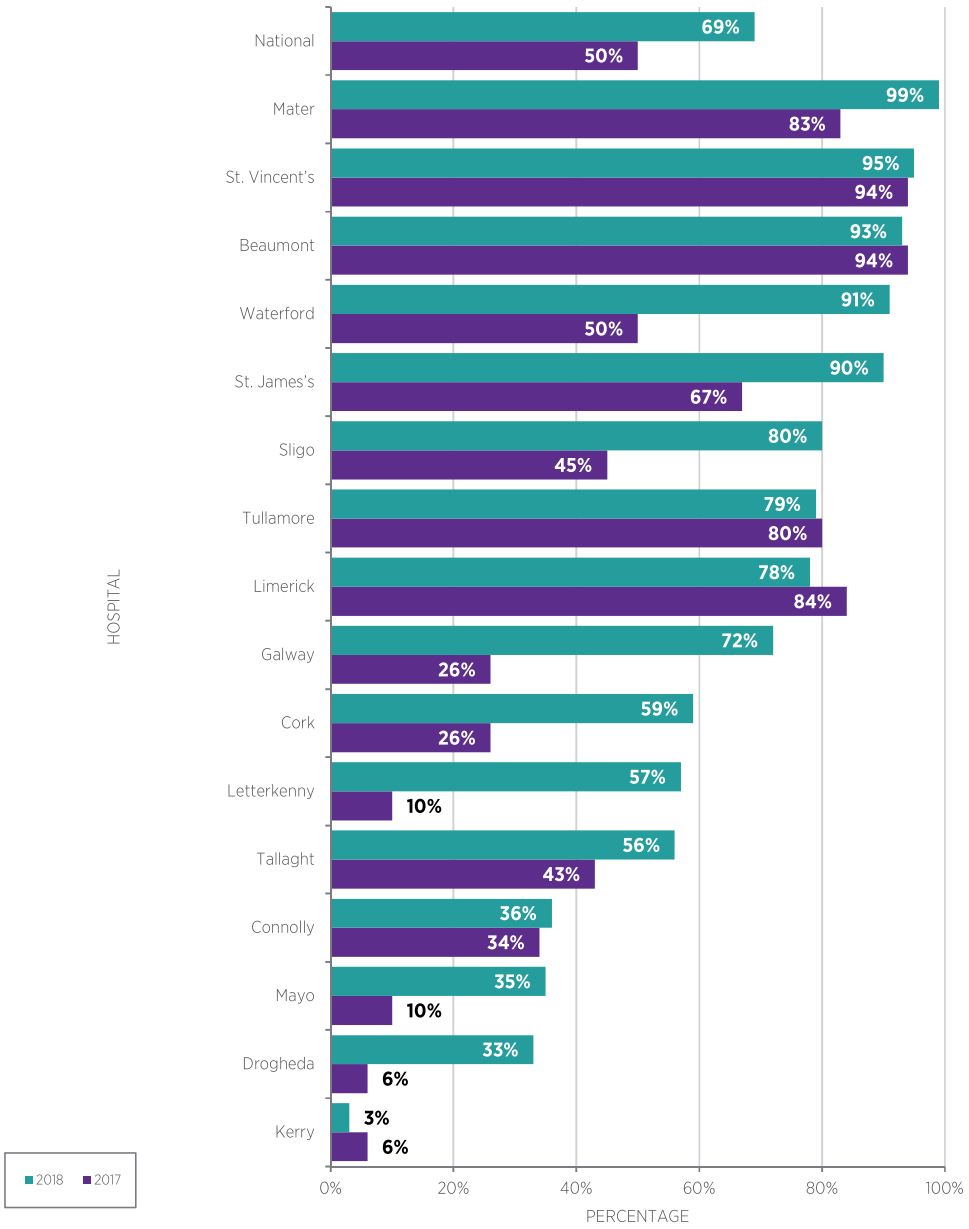


FIGURE 4.5 IHFS 4: PERCENTAGE OF PATIENTS SEEN BY A GERIATRICIAN DURING ADMISSION, BY INDIVIDUAL HOSPITAL, IN 2017 (N=3497) AND 2018 (N=3751)

LETTERKENNY UNIVERSITY HOSPITAL

From left to right: Mr Peter O'Rourke, (Orthopaedic Consultant and IHFD clinical lead), Bruce MacGregor (FLS CNS, IHFD audit coordinator), Carol McFadden, (CNM2 Orthopaedics) and Theresa Mellet (CNM2 Orthopaedics).

This section is intended to illustrate an example of service improvement in relation to IHFS 4.

The orthopaedic unit at Letterkenny University Hospital (LUH) has four consultant orthopaedic surgeons who provide both emergency and elective services. The hospital has a 37-bed orthopaedic ward and provides outpatient fracture clinics four days per week. A consultant orthogeriatrician was appointed in February 2017, and the unit has had a HFGC in place since 2018. Members of the group include orthopaedic and orthogeriatrician consultants, clinical nurse managers (CNMs) (ward and outpatient, the Assistant Director of Nursing for Surgery and the Emergency Department, the Director of Nursing, the General Manager, the Senior Physiotherapist, Senior Occupational Therapist, and the Theatre Manager, and is chaired by the Fracture Liaison Nurse. The HFGC meets every three months on the day of the specialty team meeting. The HFGC is responsible for reviewing the data from the IHFD and taking actions to try to improve on the hospital's performance in the key areas of hip fracture care. The HFGC governance group also agrees on how the monies from the Best Practice Tariff (BPT) are spent.

Since the appointment of the orthogeriatrician in February 2017, LUH has experienced a major increase in the number of hip fracture patients being assessed by a geriatrician. The orthogeriatrician attends the ward daily and will accept referrals from the orthopaedic teams or the senior ward nurses (i.e. CNM and Clinical Nurse Specialist (CNS)). The patients receive ongoing input from the orthogeriatrician during their inpatient stay, and this has led to a more holistic treatment approach for hip fracture patients. There are plans to expand the service to include outpatient follow-up by the orthogeriatrician, but this has been delayed due to a lack of clerical and outpatient support for the orthogeriatrician. As of mid-2019, there is no annual leave cover for the orthogeriatrician, who also works on the on-call medical rota, which generates a large workload away from the orthopaedic unit which can present challenges with regard to hip fracture patients from receiving timely interventions. While there are many issues to be addressed with regard to the future, the appointment of the orthogeriatrician has been a massive benefit to both orthopaedic patients and indeed the staff at LUH; it has been a proactive appointment and promotes efficiency in the service, supports improvement in the IHFS, and has helped to generate income for the hospital through the BPT.

IHFS 5

IHFS 5: PERCENTAGE OF PATIENTS RECEIVING A BONE HEALTH ASSESSMENT

84% of patients had a bone health assessment

In 2018, a bone health assessment was carried out on 84% (n=2992) of patients, with 62% (n=2190) being commenced during admission or continued from pre-admission (Figure 4.6). Twenty-eight percent (n=1056) of patients were recorded as having a previous fragility fracture (Appendix 5). Ninety-four percent (n=3536) of all fractures resulted from low-energy trauma (Appendix 5).

Figure 4.6A shows that 11 of the participating hospitals achieved in excess of 90% compliance with this standard in 2018, which is a significant improvement from 2017. The proportion of patients who met this standard at the individual hospital level in 2018 ranged from 25% to 100%.

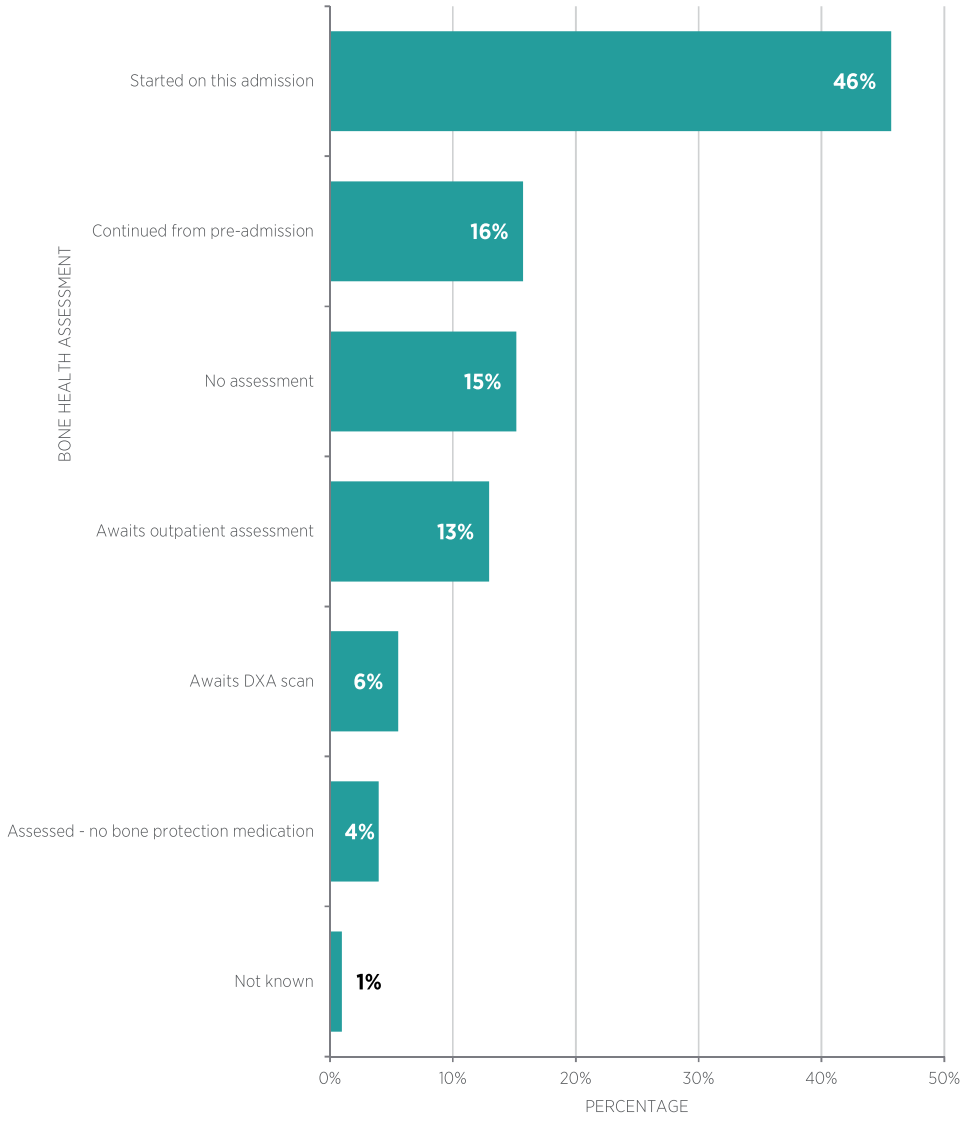


FIGURE 4.6 IHFS 5: PERCENTAGE OF PATIENTS WHO RECEIVED A BONE HEALTH ASSESSMENT IN 2018 (N=3567)[5*]

[5] 184 patients who died in 2018 have been excluded from this analysis
[*] Please note: Percentages may not sum to 100% due to rounding.

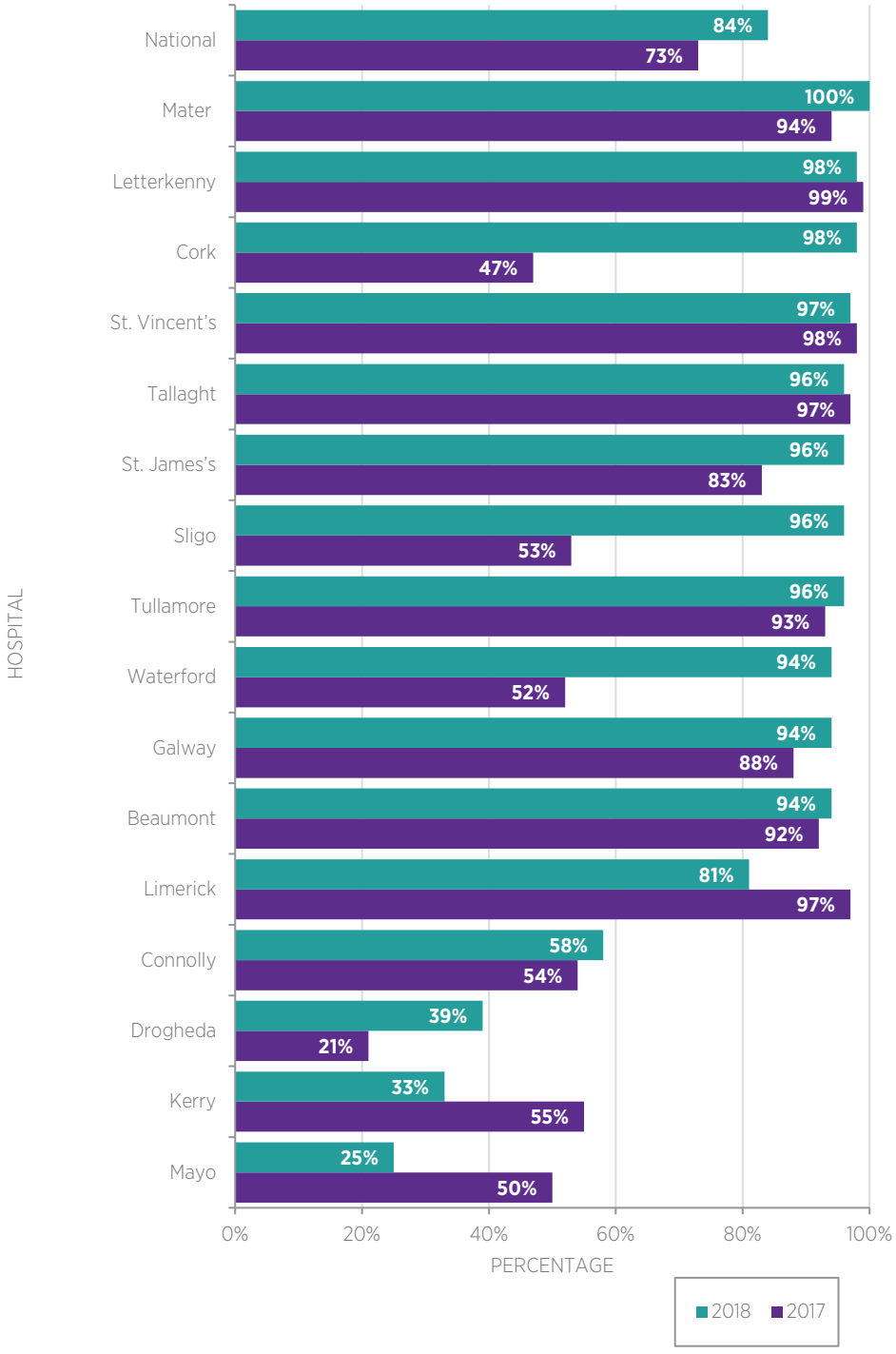


FIGURE 4.6A IHFS 5: PERCENTAGE OF PATIENTS WHO RECEIVED A BONE HEALTH ASSESSMENT, BY INDIVIDUAL HOSPITAL, IN 2017 (N=3320)[6] AND 2018 (N=3567)[7]

[6] 177 patients who died in 2017 have been excluded from this analysis
[7] 184 patients who died in 2018 have been excluded from this analysis

UNIVERSITY HOSPITAL WATERFORD

From left to right: Dr Gerry Latimore (Radiologist), Lorraine Smith (Trauma coordinator), Joanne Long (ADON, Perioperative Services), Mr Terence Murphy (Orthopaedic Consultant, IHFD clinical lead), Julie Watson (CNM2, Orthopaedic theatre), and Louise Brent (IHFD and Major Trauma Audit Manager, NOCA).

This section is intended to illustrate an example of service improvement in relation to IHFS 5.

University Hospital Waterford (UHW), based in the south east of Ireland, is a university-affiliated hospital serving the counties of Waterford, Kilkenny, Carlow, Wexford and Tipperary. For the past three years we have consistently had more than 360 patients annually admitted with hip fractures, thus making us one of the busiest units in the Republic of Ireland for hip fractures in 2018.

UHW has nine orthopaedic consultants, who cover two orthopaedic wards with 58 beds and one day ward. From Monday to Friday we operate two theatres and we operate one on the weekends.

The HFGC was set up in October 2018. Led by Mr Terence Murphy, Consultant Orthopaedic Surgeon, and Dr. Adrianna O'Halloran, Orthogeriatric Consultant, the HFGC has representation from the theatre, ED, hospital management, bed management, CNMs from the orthopaedic wards and the ambulance service. It meets every two months with the primary goal of improving the patient's experience and pathway through their treatment.

In 2017, UHW was only achieving 52% compliance with regard to hip fracture patients receiving a bone health assessment. It was recognised that this needed to be addressed in order to improve the service for patients.

In July 2018, the department of geriatric medicine appointed one of its registrars to the orthopaedic wards. This registrar provided a daily presence on the ward, with duties including early review of all newly admitted patients with a hip fracture. They would also support the orthopaedic non-consultant hospital doctors (NCHDs) with advice and teaching. In addition, there was a once-weekly ward round led by a consultant geriatrician with input from the CNMs, trauma coordinator, interns in orthopaedics, physiotherapists, and occupational therapists, and discharge planners.

Subsequently, approval was obtained to appoint a full-time orthogeriatric consultant with the main aim of improving patients' outcomes and experiences. As a result of this, more standardised protocols have been established, including early clinical assessment by the orthogeriatrician, optimisation for theatre, and the establishment of "routine bloods" for every hip fracture that was admitted, which included vitamin B12, folate and ferritin. This also incorporated the prompt falls assessment and osteoporosis workup. As a result, we have demonstrated a huge increase in our achievement of IHFS 5.

IHFS 6

IHFS 6: PERCENTAGE OF PATIENTS RECEIVING A SPECIALIST FALLS ASSESSMENT

70% of patients had a specialist falls assessment

Prior to discharge, 70% (n=2483) of patients nationally had a specialist falls assessment during their admission in 2018 (Figure 4.7). This represents a considerable improvement over 2017, when only 47% (n=1546) of patients met this standard. However, there continues to be variability in the level of service being provided in the 16 participating hospitals, ranging from 5% to 99% in 2018. This variability can be attributed to the level of orthogeriatric services and falls services provided in the individual hospitals. 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 (Appendix 2).

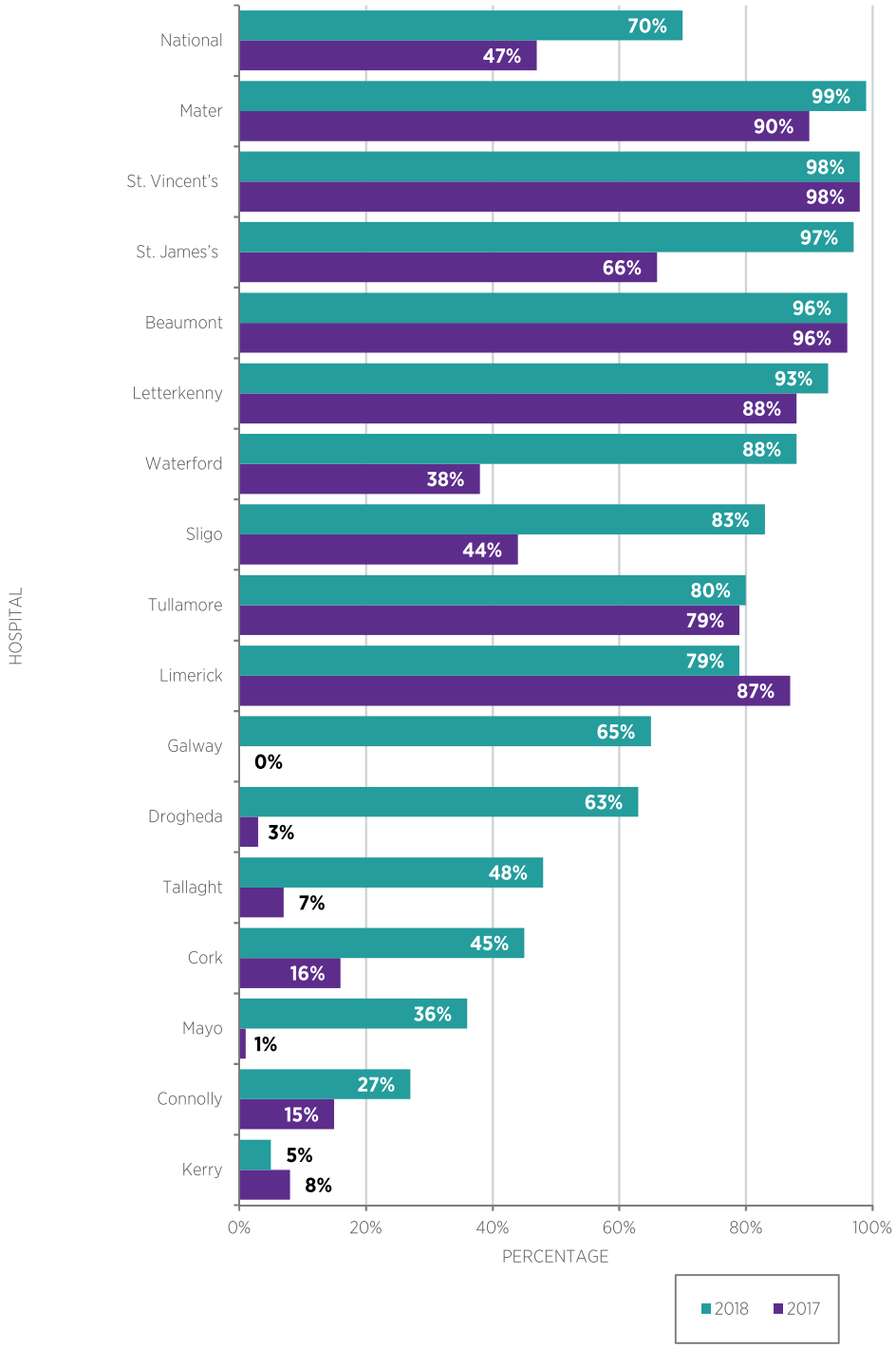


FIGURE 4.7 IHFS 6: PERCENTAGE OF PATIENTS WHO RECEIVED A SPECIALIST FALLS ASSESSMENT, BY INDIVIDUAL HOSPITAL, IN 2017 (N=3320)[8] AND 2018 (N=3567)[9]

[8] 177 patients who died in 2017 have been excluded from this analysis
[9] 184 patients who died in 2018 have been excluded from this analysis

GALWAY UNIVERSITY HOSPITAL

This section is intended to illustrate an example of service improvement in relation to IHFS 6.

Galway University Hospital is a busy trauma centre, and also receives tertiary referrals of complex cases from other Saolta University Health Care Group hospitals. Our orthopaedic service is based on St Finbarr's Ward, a 32-bed orthopaedic trauma ward. Other trauma subspecialties (including spine, hand, arthroplasty, shoulder, foot, and ankle) all share the ward, meaning that bed turnover is a high priority. We have excellent and dedicated orthopaedic nurses, who are gerontologically and frailty attuned, providing comprehensive postoperative care to hip fracture patients. During 2018, the formal introduction of the orthogeriatric service was commenced. The HFGC was set up during 2018, incorporating all hospital services involved in hip fractures, with the aim of providing the highest quality of care to our hip fracture patients and driving improvements, particularly in the area of comprehensive geriatric assessment. This includes falls assessment of hip fracture patients, as well as building on the existing bone health assessment which was in place from our rheumatology service. The HFGC meets quarterly, with the steering committee meeting monthly. The introduction of the HFGC has allowed us to 1) review our processes in detail and to focus on areas where we need to improve, 2) keep hip fracture care on the agenda at a management level, and 3) avail of BPT.

Key to this has been the development of the orthogeriatric service. Previously, an ad hoc service was provided, but with the proactive involvement of the department of geriatric medicine, working closely with the department of orthopaedics and with hospital management support, an orthogeriatric consultant service was created in March 2018. We identified that patients were already having falls assessments through physiotherapy and occupational therapy and aimed to build on this assessment through the orthogeriatric consult service. Patients then received a geriatric assessment including a medication review, cognitive screening, and diagnostics such as tilt testing and external loops where required. With the help of nursing management, our orthopaedic clinical nurse specialist was then freed to allocate more time to focus on core clinical tasks and on timely data entry, working closely with HIPE to streamline data inputting.

In August 2018, the service was further improved with the additional resources of a dedicated orthogeriatric consultant and an orthogeriatric registrar for falls and orthogeriatrics. As well as improvements in our IHFS performance and quality of care for our patients, there have been positive knock-on effects on discharge planning, length of stay on the trauma ward, and on our rehab unit for patients receiving an orthogeriatric assessment at the point of admission. Multidisciplinary working with nursing, orthopaedics, geriatrics, physiotherapy, occupational therapy and social work on the trauma ward has also improved with twice weekly multidisciplinary team board round where patient care plans are reviewed and discharge planning takes place.

From left to right, back row: Ciara McManamon (staff nurse), Dr Michelle Canavan (Orthogeriatrician), Maja Rajeou (occupational therapist), Mr Colin Murphy (Orthopaedic Consultant and IHFD Clinical Lead), Dr Ben Murphy (intern), and Josipa Kušek (cleaning staff); middle row: Sandra Burke (occupational therapist), Barbara Hughes (ward clerk), Kathleen Gallagher (healthcare assistant), Dr Megan Diack (SHO), and Bláithín Kissane (senior orthopaedic physiotherapist); **front row:** Siobhan Ní Liathain (cleaning staff), Aoife Dempsey (clinical nurse specialist and IHFD audit coordinator), Ruth McLoughlin (Clinical nurse manager 1), Sunija Kavamkattu (staff nurse), and Aine Lenfestey (St. Finbars).

BEST PRACTICE TARIFF

In 2018, the IHFD supported the introduction of the Best Practice Tariff (BPT). This process involved collaboration between the Healthcare Pricing Office (HPO), National Clinical Advisor and Group, the Health Service Executive (HSE), the Clinical Programme for Trauma and Orthopaedic Surgery, and the National Office of Clinical Audit (NOCA).

The BPT is a payment for hospitals operating on hip fracture patients (aged 60 years and over) which achieve eight standards of care for individual patients. This payment is a performance incentive linked to quality care in the form of the Irish Hip Fracture Standards (IHFS) and data quality standards (Table 4.1). Each hospital will receive €1,000 per case that meets the BPT, and this money is to be used by the hospital to improve patient care within the trauma service. The BPT is structured so that 30% of the payment goes to the hospital management and 70% to the trauma service. The BPT is reported quarterly to the hospitals, and the clinical lead for the local HFGC links directly with the hospital finance manager to access the funds for the purpose designated by the HFGC.

Tariff-based incentives have been used in other health systems. Research published by Metcalfe et al (2019) compared the data from England with that in Scotland, which does not provide BPT payments to hospitals and found that the BPT scheme saved up to 7,600 lives in England between 2010 and 2016. The research also highlights the BPT drove changes in practice that reduced mortality for hip fracture patients in England and led to generally improved standards of care overall and a reduction in readmissions to hospital. There are also considerations to be taken into account around unintended consequences of a tariff-based model. This remains to be seen in the Irish health system, but will be part of the ongoing evaluation of the hip fracture BPT.

This report shows, however, that for the period of 2018, due to factors that may or may not be entirely attributable to the BPT, there has been a significant improvement shown in the data quality, with improved data coverage, local hospital governance and clinical performance. This level of improvement has not been demonstrated in any of the previous IHFD reports for a single 12-month period.

TABLE 4.1: IRISH HIP FRACTURE STANDARDS AND BEST PRACTICE TARIFF MEASURES

IRISH HIP FRACTURE STANDARDS		BEST PRACTICE TARIFF MEASURES
Standard 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.		**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 Standard 1.**
Standard 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).		**If patients receive surgery within 48 hours and during normal working hours, they meet Standard 2.**
Standard 3: All patients with hip fracture should be assessed and cared for with a view to minimising their risk of developing a pressure ulcer.		**If patients do not develop a new Grade 2 or higher pressure ulcer during admission, they meet Standard 3.**
Standard 4: All patients presenting with a fragility fracture should be managed on an orthopaedic ward, with routine access to acute orthogeriatric medical support from the time of admission.		**If patients are reviewed by a geriatrician at any point during their admission, they meet Standard 4.**
Standard 5: All patients presenting with a fragility fracture should be assessed to determine their need for therapy to prevent future osteoporotic fractures.		**If patients receive a bone health assessment, they meet Standard 5.**
Standard 6: All patients presenting with a fragility fracture following a fall should be offered multidisciplinary assessment and intervention to prevent future falls.		**If patients receive a specialist falls assessment, they meet Standard 6.**
		**Minimum quarterly data coverage of 90% is required by individual hospitals.**
		**Evidence of a local HFGC must be present in each hospital.**

BPT AND COVERAGE

During the implementation of the BPT, the importance of collecting sufficient volumes of data was ensured with the creation of a standard for submitting 90% of data per reporting quarter and annually by each of the participating hospitals. In 2018, all eligible hospitals met this standard, and the highest level of coverage to date was recorded for the audit (99%). Figure 4.8 shows the steady improvement in coverage year on year since national reporting began for the IHFD.

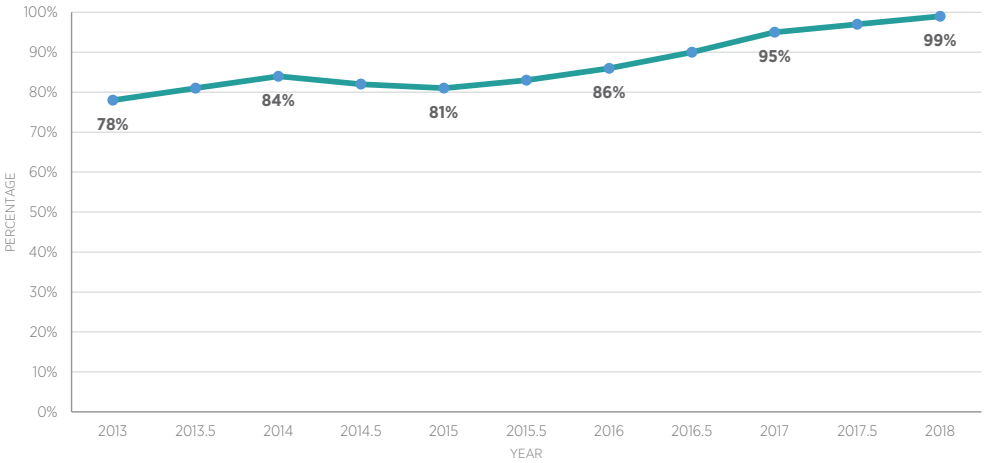


FIGURE 4.8: IHFD COVERAGE BY YEAR, 2013–2018

BPT PAYMENTS BY HOSPITAL

In October 2018, the first financial payments of the BPT were issued to the hospitals for the period of January–June 2018. A total of €34,000 was paid out to 8 hospitals for quarter one, €71,000 to 9 hospitals for quarter two, €90,000 to 12 hospitals for quarter three, and finally €83,000 was paid to 11 hospitals for quarter four. The total amount paid out as a result of the BPT for 2018 was €278,000.

Despite the fact that this is a substantial amount of money and has been shown to have had a positive effect on the system overall, it highlights that only 7% of patients with a hip fracture received the best practice standard of care in 2018. Two hospitals, Mayo University Hospital and University Hospital Kerry, did not receive any BPT payments in 2018. Hospital management and the HFGCs from those hospitals should consider how they can improve their service in order to ensure that patients receive the highest standard of care. The total payments received by each hospital for 2018 are presented in Figure 4.9.

Feedback from the hospitals that did receive BPT payments detailed what they used the money to purchase. Some of the items purchased included:

- bladder scanners
- Lo-Lo beds
- hoists
- under-body warming blanket for theatre
- equipment for dementia-friendly wards
- portable ultrasound scanners
- sub-epidermal moisture scanners (pressure ulcer scanners)
- comfort equipment for patients.

Money was also allocated for staff, including supporting staff, to attend conferences and training (i.e. plaster courses), and to carry out research projects, as well as towards the development of a nursing orthopaedic course within one hospital.

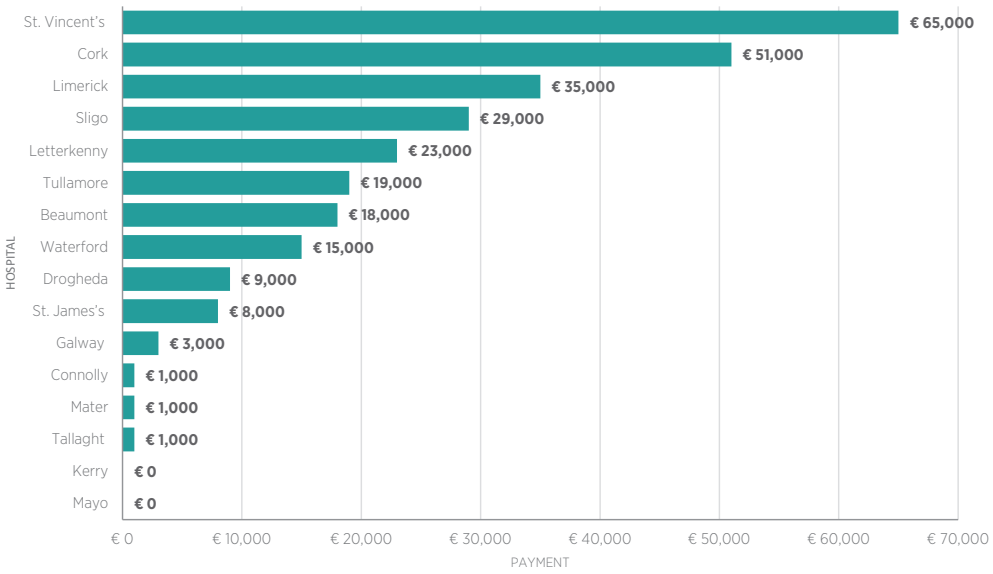


FIGURE 4.9: TOTAL BPT PAYMENTS BY HOSPITAL, 2018

BPT PAYMENTS AS A PROPORTION OF PATIENT VOLUME BY HOSPITAL

Each of the 16 hospitals participating in the IHFD had a different volume of hip fracture patients in 2018, ranging from 115 to 455. Figure 4.10 shows what percentage of each hospital's hip fracture cases met the BPT as a proportion of each hospital's overall volume of hip fracture patients. Sligo University Hospital had the highest proportion of patients meeting the BPT, with one in four patients achieving the BPT.

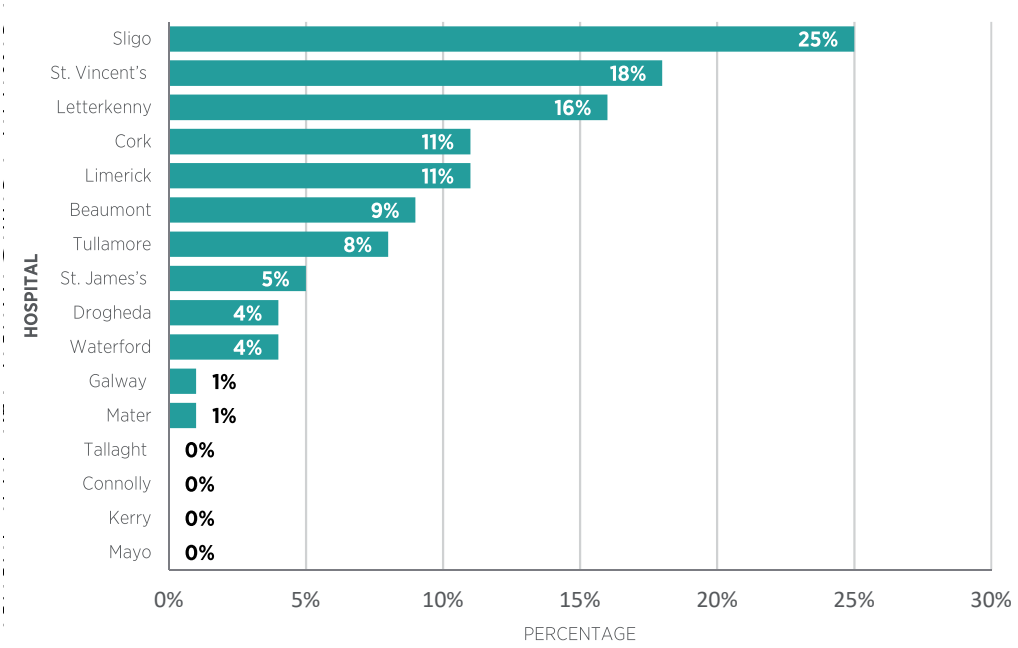


FIGURE 4.10: PROPORTION OF PATIENTS MEETING BPT BY HOSPITAL, 2018

SLIGO UNIVERSITY HOSPITAL

This section is intended to illustrate an example of service improvement in relation to the BPT.

Sligo University Hospital (SUH) has been participating in the IHFD since 2014. This has led to significant improvements in all six IHFS each year since our involvement in the audit.

SUH has an 18-bed dedicated orthopaedic unit, with the capacity to increase that number to 24 should it be required, catering to both elective and trauma patients. There are five orthopaedic consultants and one orthogeriatrician, whose services are a vital part of the unit's success. A physiotherapist and an occupational therapist also form a central part of the ward team. The orthopaedic ward's 18 nursing staff includes the clinical nurse managers. The specialised skill set of the staff involved leads to a higher standard of patient care, as the majority of the nursing staff on the ward have an orthopaedic qualification.

The unit has two dedicated orthopaedic theatres: one elective theatre and one trauma theatre. Access to the trauma theatre (08.30–12.30, Monday to Friday) enables us to carry out surgical procedures more efficiently.

Our HFGC was established in 2018. We meet every two months to review statistics and discuss the IHFD periodic reports. The HFGC reflects the multidisciplinary nature of the staff involved, with representatives including orthopaedic consultants, the orthogeriatrician, anaesthesiologists, members of the ED and physiotherapy teams, and nursing staff.

Through continued audits and frequent meetings, we strive to improve the quality of patient care.

We were very pleased and indeed very proud that 46% of our patients were admitted to the orthopaedic ward in under four hours in 2017 and 43% in 2018, making us the best performing hospital in IHFS 1. This showed marked improvement since 2014, when we only achieved 11.6% success in this standard.

Like all our partners across the remaining 15 participating hospitals, we experience the same problems and delays

From left to right: Mr John Kelly (Orthopaedic Consultant), Mr Barry O Neill (Orthopaedic Consultant), Therese Gallagher (Assistant Director of Nursing), Mary Conlon (Discharge Facilitator), Mr Ahmed Karkuri (Orthopaedic Consultant), Mr Bill Gaine (Orthopaedic Consultant), Michael Mc Donagh (CNM2, ED), Dr Abdalla Kashir (Orthopaedic Registrar), and Dr Usman Alvi (Orthopaedic Registrar). **Front row, left to right:** Regina Mitchell (CNM2, Orthopaedic Theatre), Aisling Kelly (CNM2, Orthopaedic Theatre), Ann Judge (CNM2, Orthopaedic Ward), and Ann Marie Mullen (IHFD Audit Coordinator).

admitting to the orthopaedic ward from the ED. In SUH, we have had a long-established Orthopaedic Specialist Group which meets monthly to discuss issues that arise. This was the forum where the SUH hip fracture data were discussed prior to setting up the HFGC.

A local implementation group was formed to lead on changes required to our practice. One of the outcomes was the development of the fast-track protocol for hip fracture 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. Regular teaching sessions were held with all team members, leading to increased awareness of the IHFD programme and its potential benefits for patients. The IHFD programme and local HFGC have allowed us to bring a more structured and focused approach to resolving problems and improving outcomes.

We have consistently performed well in transferring patients to theatre within 48 hours. In 2018, the quarterly reports indicated a decline in our performance against IHFS 2 over the last two-year period. Arising from this, we took the decision to re-audit the data. We discovered that 46 of our 139 patients were outside of the 48-hour target. A more detailed review showed that 90% of these patients were, in fact, on anticoagulant therapy. Of the remaining 10%, it was agreed among the orthopaedic surgeons that hip fracture patients should be prioritised and placed first on the trauma list.

We also look forward to increased involvement by the frailty intervention service that we have recently developed in the hospital.

Twenty-nine of our patients met all six IHFS in 2018, giving us BPT payments totalling €29,000. Of these payments, €5,000 was spent on a research project which is currently underway. The money was also used to purchase specialised sensor insoles to conduct a study comparing partial weight bearing and full weight bearing in postoperative patients.

In theatre, we acquired an under-body warming blanket to improve patients' core temperature and comfort. The orthopaedic unit received a comfort chair, and is currently awaiting the delivery of a hoist with a weighing function. There are also plans to purchase a doppler and a bladder scanner in the near future.

Although the BPT has certainly been a motivating factor, it is not the main driving force for SUH to attain the best results that we can for our patients. It is our intention to continue to drive improvements into the future.

KEY FINDINGS FROM CHAPTER 4

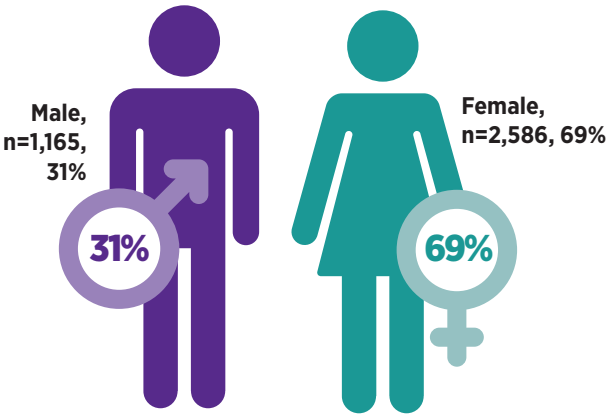
- In 2018, 17% of patients were admitted to an orthopaedic ward or theatre from the ED within four hours, compared with only 11% of patients in 2017. Although improvements have been made, further progress is required.
- In 2018, 72% of surgeries were conducted within 48 hours and within normal working hours. This has improved slightly since 2017.
- In 2018, 3% of hip fracture patients developed a pressure ulcer after admission to hospital. This has remained unchanged since 2017.
- A geriatrician reviewed more than two-thirds (69%) of patients at some time during their acute stay in 2018. This represents a considerable improvement since 2017, when only 50% of patients were reviewed by a geriatrician during their stay.
- In 2018, a bone health assessment was carried out on 84% of patients nationally (compared with 73% in 2017). Eleven of the participating hospitals achieved in excess of 90% compliance with this standard in 2018.
- Prior to discharge, 70% of patients nationally had a specialist falls assessment in 2018, compared with only 47% in 2017. This marks a significant improvement in the past year.
- Although improvements have been made nationally with regard to the IHFS, there continues to be variability in the level of service being provided in the 16 participating hospitals.
- In 2018, the BPT was introduced, with participating hospitals receiving a total of €278,000; this represents 7% of all hip fracture patients nationally meeting all eight BPT standards. Sligo University Hospital demonstrated the best performance, with 25% of its patients meeting the BPT standards.

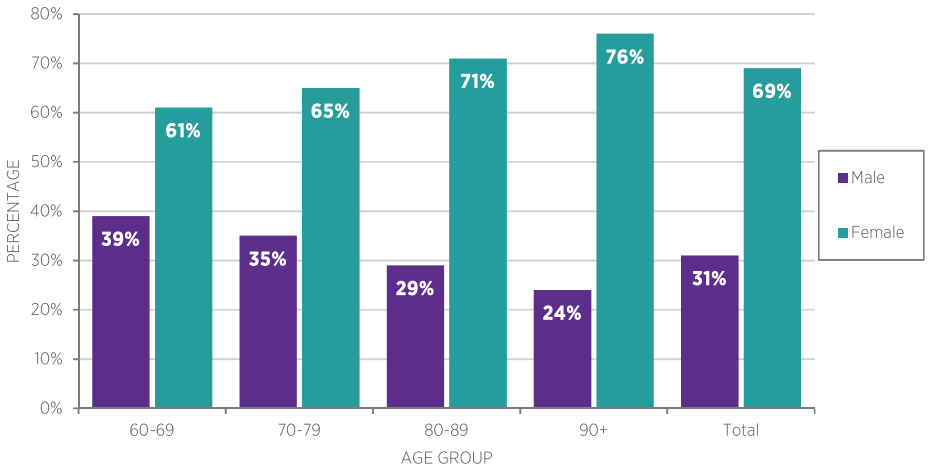
CHAPTER 5
CASE MIX

CHAPTER 5: **CASE MIX**

GENDER AND AGE GROUP

Of the 3,751 hip fracture cases recorded in 2018, 69% (n=2586) were female and 31% (n=1165) 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: 76% (n=447) of this cohort was female (Figure 5.1). The average age for hip fracture patients was 81 in 2018. Internationally, the average age of hip fracture patients appears slightly older than the Irish cohort. In a paper published by Johansen *et al*. (2017), the average age of hip fracture patients reported in other countries was as follows: 82 in Sweden, 83 in Denmark, 80 in Norway, 83 in the UK and Wales, 82 in Scotland, 82 in New Zealand, and 82 in Australia.





Age group	60-69	70-79	80-89	90+	Total
Male	186	387	451	141	1165
Female	290	721	1128	447	2586

FIGURE 5.1: PERCENTAGE OF PATIENTS BY GENDER AND AGE GROUP (N=3751)*

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

SOURCE OF ADMISSION

The home continues to be the place from which patients are most likely to be admitted to hospital (83%, n=3115) (Figure 5.2). Ten percent (n=371) of patients were admitted from a nursing home or other long-stay facility, and an additional 6% (n=240) were transferred from another acute hospital/HIPE-reporting hospital. However, this distribution shifts slightly as people get older; 18% (n=104) of patients aged 90 years or over were admitted from a nursing home or other long-stay facility.

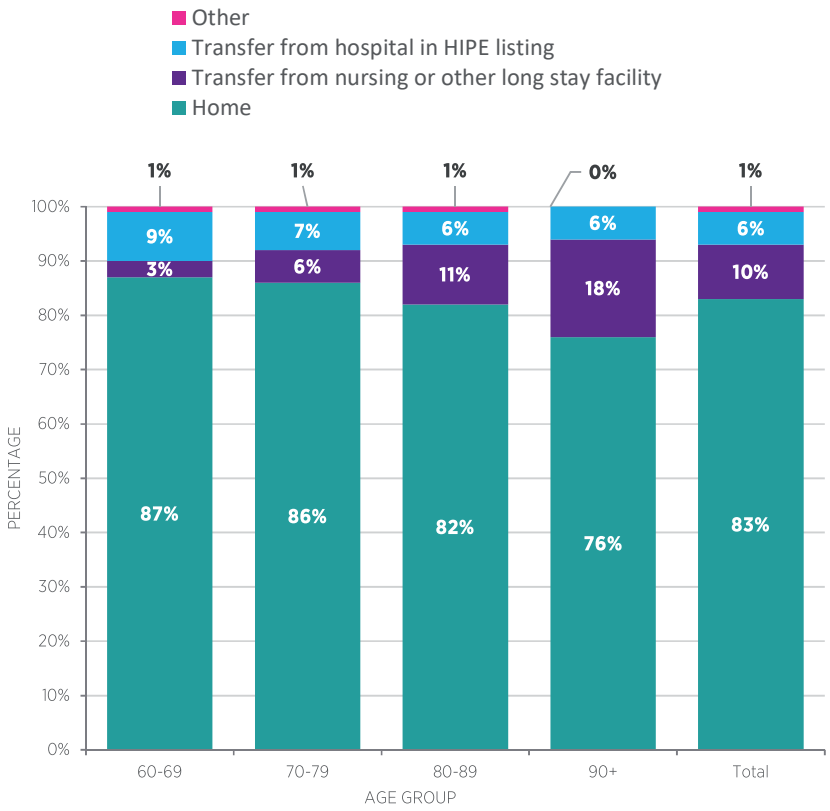


FIGURE 5.2: PERCENTAGE OF PATIENTS BY AGE GROUP AND SOURCE OF ADMISSION TO HOSPITAL (N=3751)*

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

ABBREVIATED MENTAL TEST SCORE

An Abbreviated Mental Test (AMT) Score (developed by Hodkinson, 1972) was recorded in just 14% (n=509) of hip fracture cases; this represents an increase since 2017, when only 8% (n=276) of patients had an AMT Score recorded. There is still a deficit in the recording of AMT Scores, which is a reflection of this test not being conducted as opposed to data not being recorded. Of those cases recorded, 75% (n=384) had scores of 7 to 10 inclusive, meaning that they were not likely to have cognitive impairment (Figure 5.3). Following a pilot test in Tallaght University Hospital, the 4AT, a rapid clinical test for delirium (Bellelli *et al*., 2014), has been introduced as a new field in the national dataset for 2019.

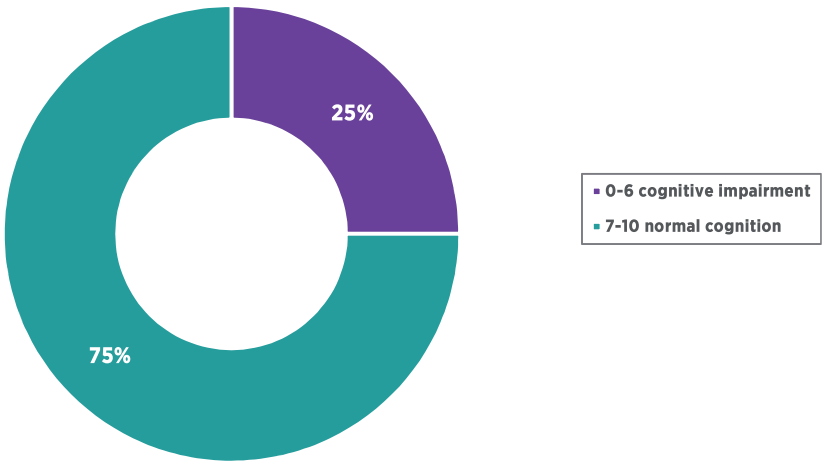


FIGURE 5.3: LEVEL OF COGNITION OF PATIENTS WITH A RECORDED AMT SCORE (n=509)*

* 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) (Table 5.1) were recorded for 93% (n=3294) of patients. The highest proportion of cases were graded as ASA Grade 3 – Severe (52%, n=1718), followed by Grade 2 – Mild (37%, n=1208). Grade 4 cases accounted for just 7% (n=215) of hip fracture cases (Figure 5.4). 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 show that as patients get older, their ASA grades increase in severity. For example, 40% (n=171) of patients aged 60–69 years were assigned an ASA grade of 3 or 4, whereas almost three-quarters (n=381) of patients aged 90 years or over were assigned one of these grades (Figure 5.4).

TABLE 5.1: ASA PHYSICAL STATUS CLASSIFICATION

ASA grade	Description
Grade 1	Healthy person
Grade 2	Mild systemic disease
Grade 3	Severe systemic disease
Grade 4	Severe systemic disease that is a constant threat to life
Grade 5	A moribund person who is not expected to survive without the operation

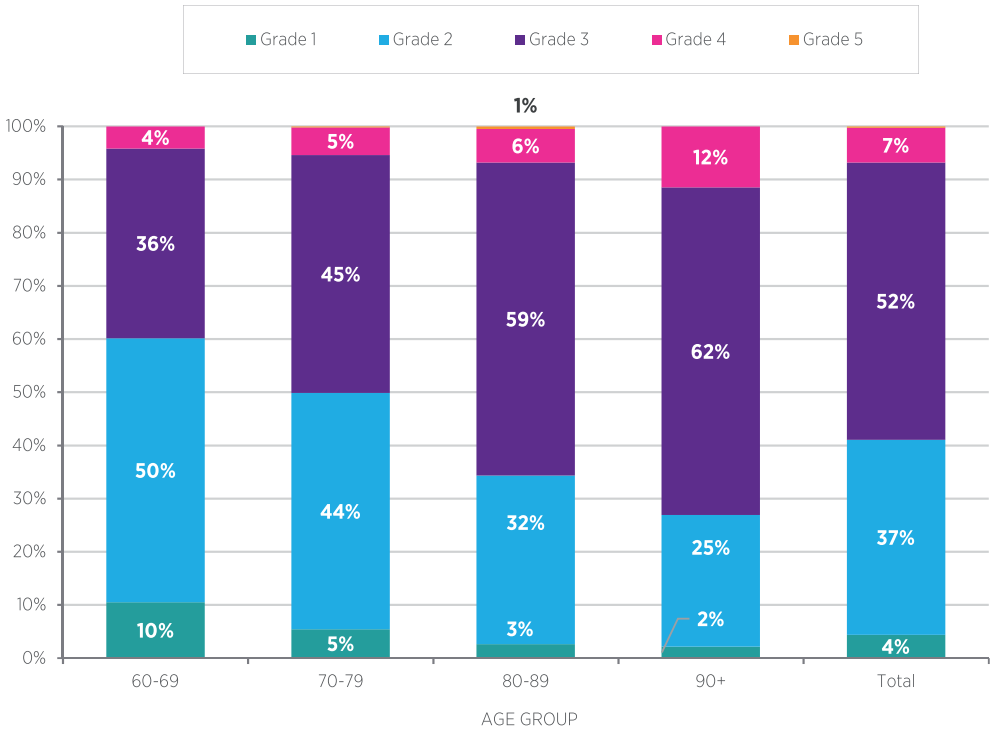


FIGURE 5.4: ASA GRADE FOR PATIENTS WITH A RECORDED SCORE BY AGE GROUP (N=3294)[10*]

[10] 457 patients did not have an ASA grade recorded.
* Please note: Percentages may not sum to 100% due to rounding.

PRE-FRACTURE MOBILITY, NEW MOBILITY SCORE

The New Mobility Score (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 5.2) (Kristensen *et al*., 2010; Kristensen *et al*., 2008; Parker and Palmer, 1993). Forty-nine percent (n=1713) of patients were documented as having high functional mobility pre-fracture (an NMS of 7–9) and 51% (n=1793) had low functional mobility pre-fracture (an NMS of 0–6). When NMS is compared by age group, it shows that as age increases, the pre-fracture level of high functional mobility decreases (Figure 5.5). Further details regarding the different levels of function – defined by the NMS as indoor walking, outdoor walking, and shopping – are provided in Figure 5.6.

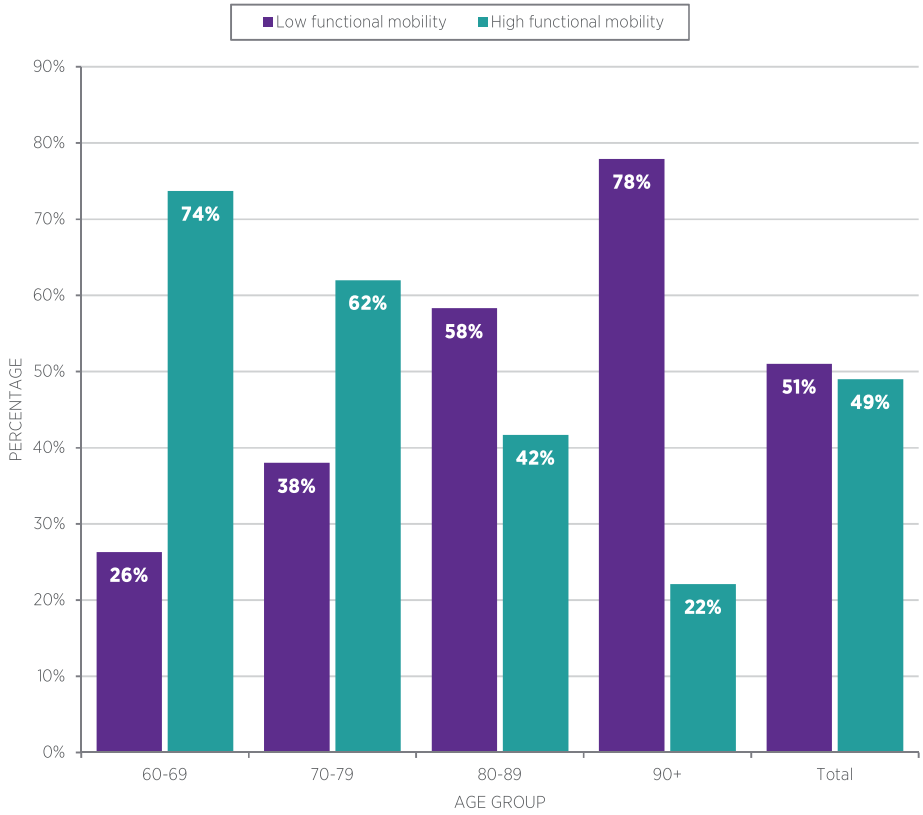


FIGURE 5.5: PRE-FRACTURE LEVEL OF MOBILITY FOR PATIENTS RECORDED WITH A TOTAL NMS BY AGE GROUP (n=3506)[11]

[11] Only patients with scores for all three types of mobility are included in this analysis; 245 patients did not have an NMS recorded for indoor walking, outdoor walking, or shopping.

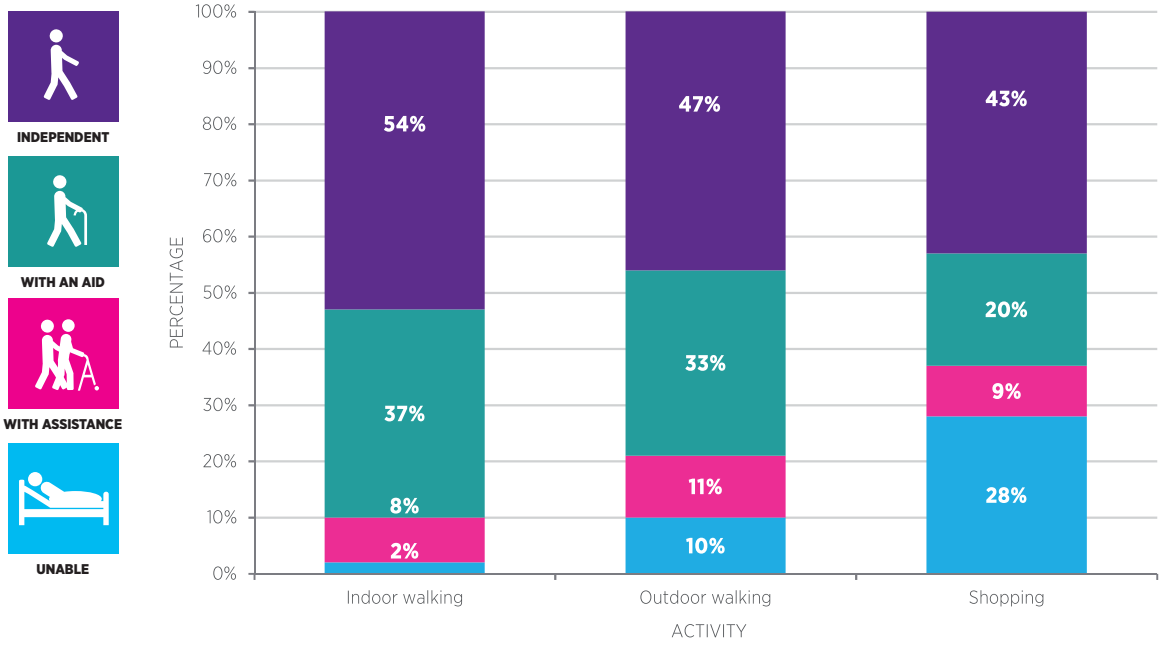


FIGURE 5.6: PRE-FRACTURE LEVEL OF MOBILITY WITHIN THREE FUNCTIONAL ACTIVITIES (NMS) (n=3506)[12]

TABLE 5.2: 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	

[12] Only patients with scores for all three types of mobility are included in this analysis; 245 patients did not have an NMS recorded for indoor walking, outdoor walking, or shopping.

TYPE OF FRACTURE

The most common types of fractures recorded continue to be intracapsular (displaced) fractures (38%, n=1408) and intertrochanteric fractures (35%, n=1330) (Figure 5.7). The type of fracture was recorded as 'not known' in 4% (n=164) of cases, which signifies a decline in data quality for this field since 2017, when only 2% (n=76) of cases had an unknown fracture type recorded.

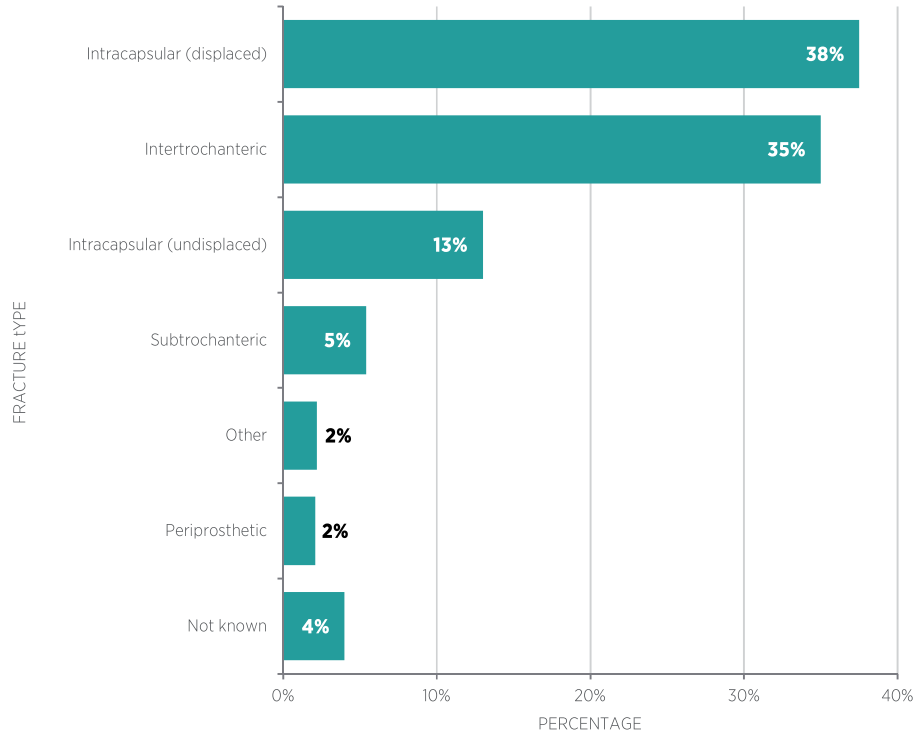


FIGURE 5.7: PERCENTAGE OF PATIENTS WITH EACH TYPE OF FRACTURE (N=3751)*

KEY FINDINGS FROM CHAPTER 5

- Of the 3,751 hip fracture cases recorded in 2018, 69% were female (n=2586).
- Home continues to be the place from which patients are most likely to be admitted to hospital (83%, n=3115).
- Only 40% (n=171) of patients aged 60–69 years were assigned an ASA grade of 3 or 4, compared with almost three-quarters (n=381) of patients aged 90 years or over, indicating that as age increases, so does medical morbidity.
- The most common types of fractures recorded in 2018 were intracapsular (displaced) fractures (38%, n=1408) and intertrochanteric fractures (35%, n=1330).

* 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 6.1 shows that 92% (n=3468) of patients presented directly to an ED in an operating hospital; this has remained unchanged since 2017 and is a direct result of the IHFD data being used by the Clinical Programme for Trauma and Orthopaedic Surgery, the National Ambulance Service (NAS), the Dublin Fire Brigade (DFB) and the HSE to introduce a national bypass for hip fracture. A further 7% (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. Figure 6.1A displays this information at hospital level; the percentage of patients presenting directly to an ED in an operating hospital ranged from 73% to 99% in 2018.

92% of patients presented directly to an ED in an operating hospital

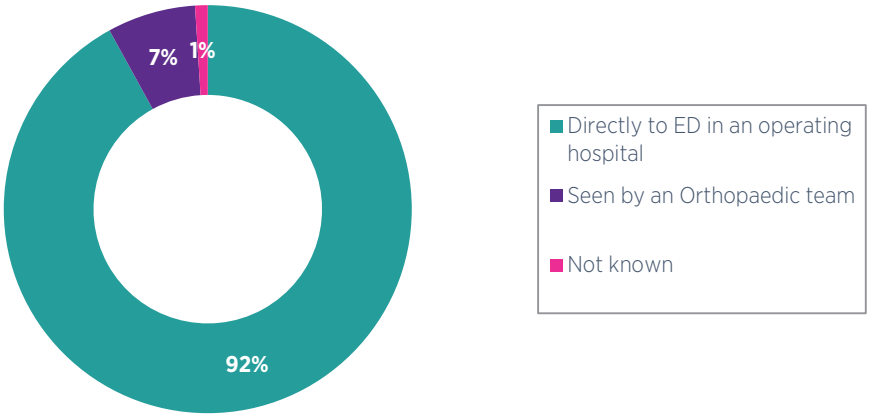


FIGURE 6.1: MODE OF ADMISSION TO OPERATING HOSPITAL (N=3751)

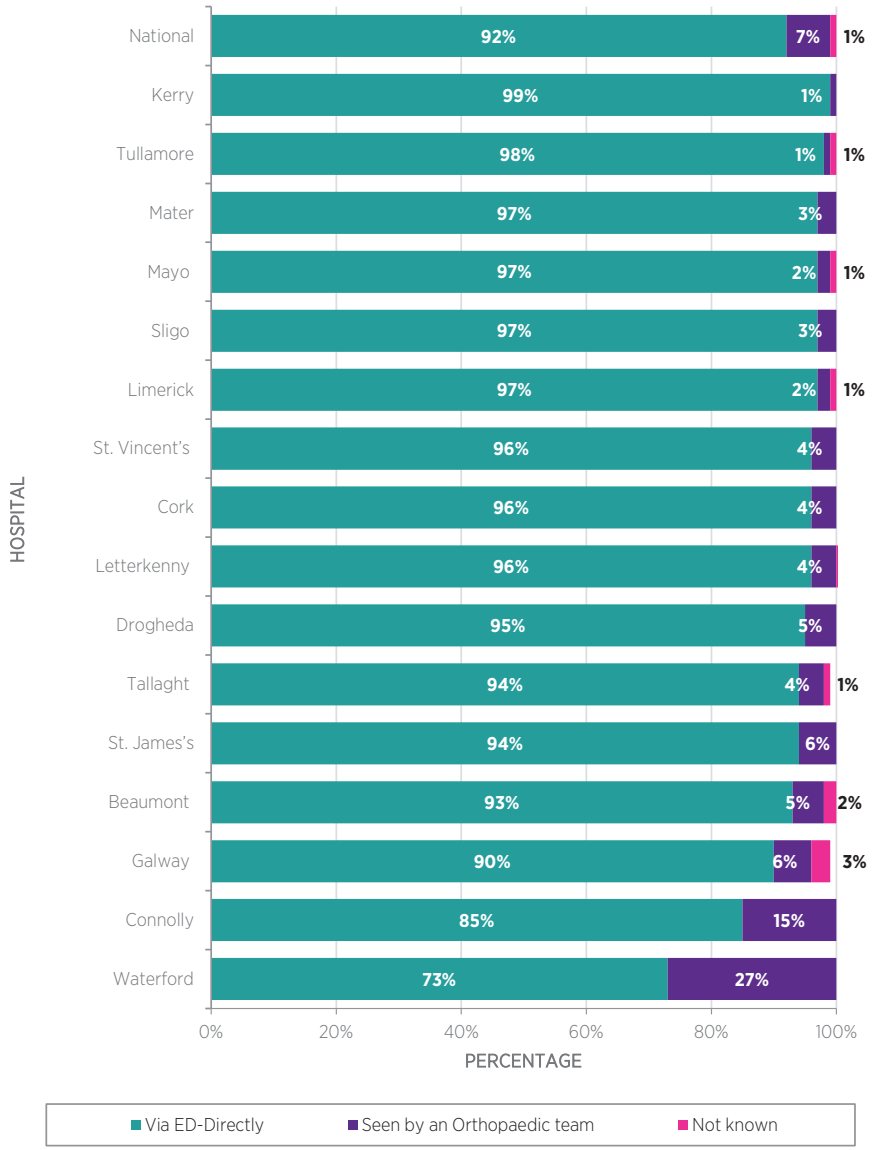


FIGURE 6.1A: MODE OF ADMISSION TO OPERATING HOSPITAL, BY HOSPITAL (N=3751)*

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

REASON FOR DELAY TO SURGERY

One-quarter (25%, n=898) of patients received surgery more than 48 hours after their admission to hospital. For 24% (n=176), no reason was given for their delay to surgery. For the 722 patients who had a recorded reason for delay, 'Awaiting medical review, investigation, or stabilisation' (65%, n=472) was the most common reason provided. 'Awaiting space on the theatre list' (14%, n=99) and 'Awaiting orthopaedic diagnosis or investigation' (5%, n=39) were the two other most common reasons for delays (Table 6.1).

TABLE 6.1: REASON FOR DELAY TO SURGERY*

Reason for delay to surgery (if after 48 hours)	**n**	**%**
Awaiting orthopaedic diagnosis or investigation	39	5%
Awaiting medical review, investigation, or stabilisation	472	65%
Awaiting inpatient or high-dependency bed	4	1%
Awaiting space on theatre list	99	14%
Problem with theatre or equipment	5	1%
Problem with theatre, surgical, or anaesthetic staff cover	13	2%
Cancelled due to list over-run	14	2%
Other	38	5%
Not known	38	5%
Total	722	100%

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

CUMULATIVE TIME TO SURGERY

Figure 6.2 shows that 42% (n=1489) of patients received their surgery within 24 hours, 60% (n=2098) within 36 hours, and 74% (n=2621) within 48 hours of presentation, some of whom received their surgery outside of working hours (n=60). This represents a small improvement since 2017. In 2019, the percentage of patients who received their surgery within 24, 36 and 48 hours will be reported quarterly.

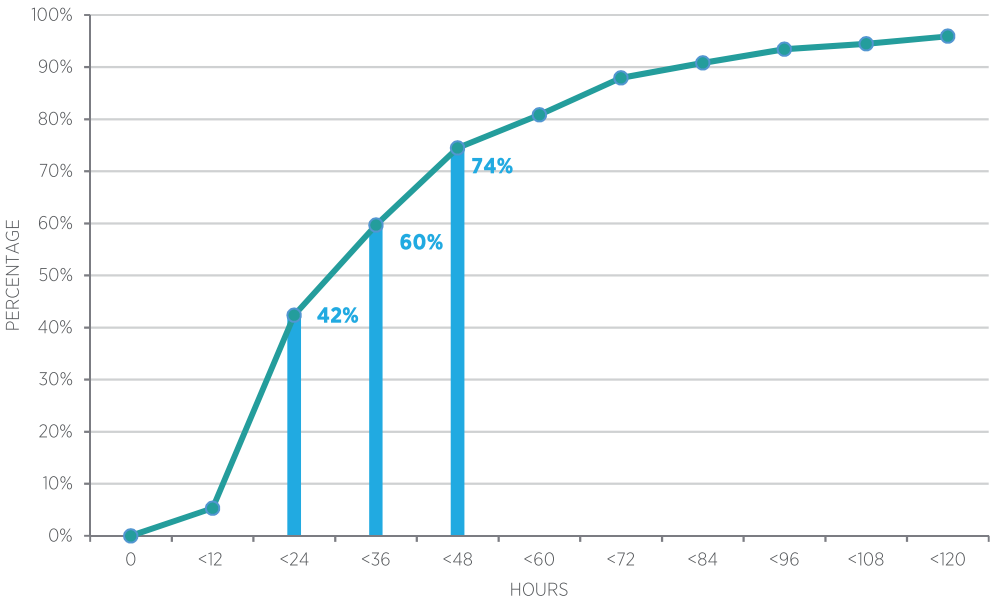


FIGURE 6.2: CUMULATIVE TIME TO SURGERY (n=3519)[13]

[13] 197 cases did not have surgery and 35 cases did not have a valid time to surgery. Both groups have been excluded from the analysis.

TYPE OF ANAESTHESIA

Spinal anaesthetic (SA) only continues to be the predominant type of anaesthesia used (53%, n=1866) (Figure 6.3). It is also used in combination with general anaesthetic (GA) (2%, n=79) or, increasingly, with a nerve block (22%, n=767). Figure 6.3a displays this information at hospital level. There appears to be a large variation in the type of anaesthesia used in Irish hospitals; for example, University Hospital Limerick used SA on for the vast majority (94%) of its patients while the Mater Misericordiae University Hospital mainly GA for its patients (74%).

In 2018, a new variable was introduced to measure whether patients were receiving a pre-operative nerve block either in the ED or on the ward after the patient was admitted, and early data from this field show that just over 50% of patients were receiving a nerve block as part of their pain management. In the 2019 national report we will present these data at hospital level.

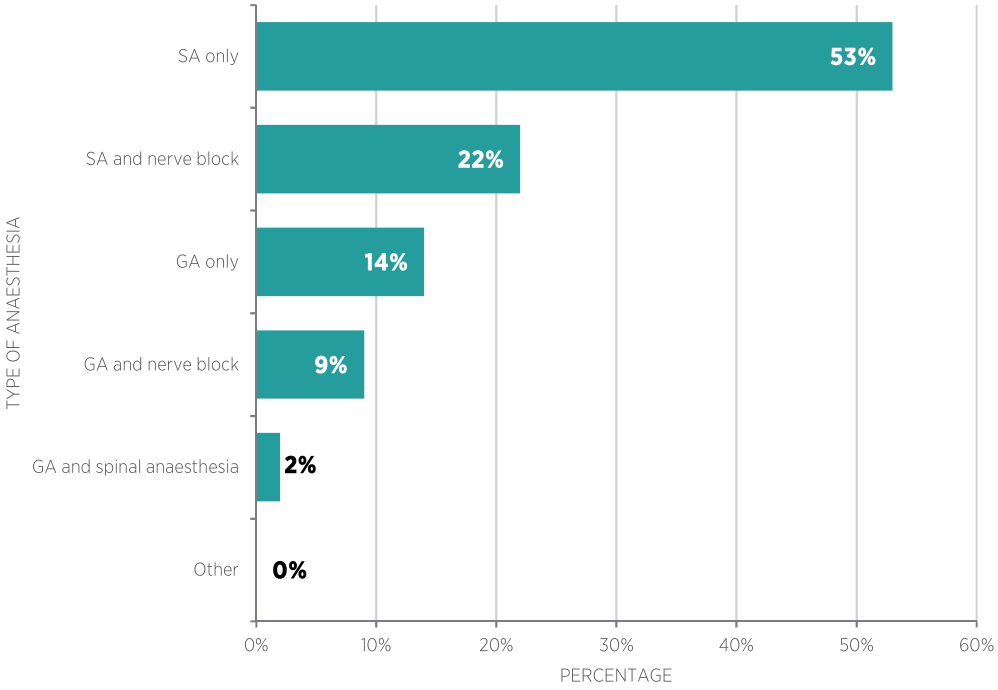


FIGURE 6.3: PERCENTAGE OF PATIENTS BY TYPE OF ANAESTHESIA (n=3554)[14] *

[14] 197 cases who did not have surgery have been excluded from the analysis
* Please note: Percentages may not sum to 100% due to rounding.

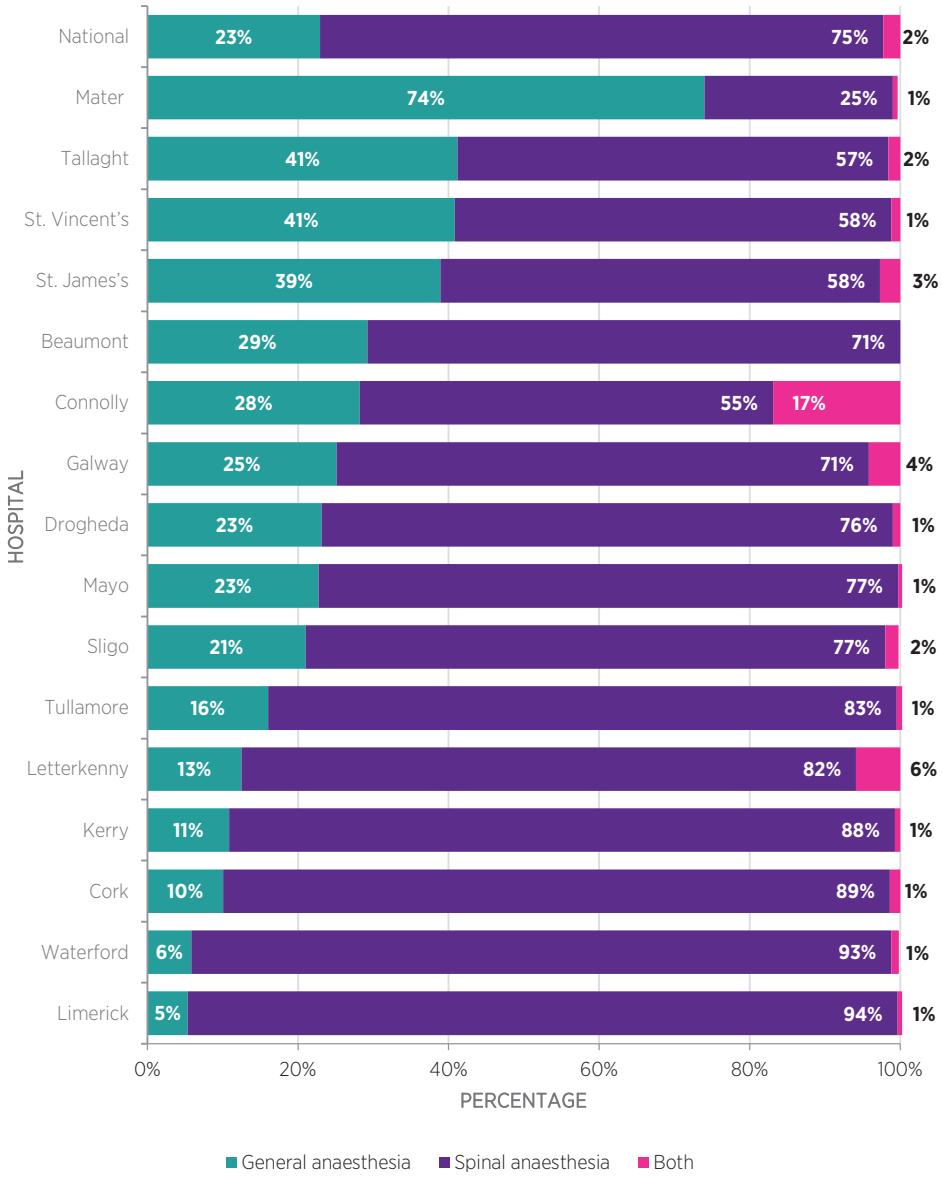


FIGURE 6.3A: PERCENTAGE OF PATIENTS BY TYPE OF ANAESTHESIA, BY HOSPITAL (n=3533)[15*]

[15] 197 cases who did not have surgery and 21 cases who had 'Other' or 'Not known' recorded as their type of anaesthesia have been excluded from the analysis

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

TYPE OF SURGERY

Thirty-five percent (n=1233) of patients underwent a cemented hemiarthroplasty and 18% (n=647) underwent internal fixation by dynamic hip screw (DHS) (Figure 6.4). Table 6.2 details the fixation of fractures by fracture type. Ninety-four percent (n=1312) of patients with an intracapsular fracture (displaced) underwent either a hemiarthroplasty or a total hip replacement (THR), whereas 69% (n=303) of patients with an intracapsular fracture (undisplaced) underwent either a hemiarthroplasty or a THR. Ninety-three percent (n=1197) of patients with an intertrochanteric fracture underwent internal fixation, whereas 94% (n=183) of patients with a subtrochanteric fracture underwent internal fixation.

There has been a continuously low level of THR performed (4%) in Ireland in comparison with other international hip fracture registers (Johansen et al., 2017); this is in part due to the fact that many orthopaedic trauma surgeons in Ireland have not specialised in arthroplasty, and therefore it is common in many hospitals for patients to have to wait for a specific surgeon or not receive a THR which would otherwise be indicated. The number of orthopaedic surgeons with an arthroplasty specialisation should be examined at a hospital level and theatre rosters planned to maximise the availability of that skill set for patients.

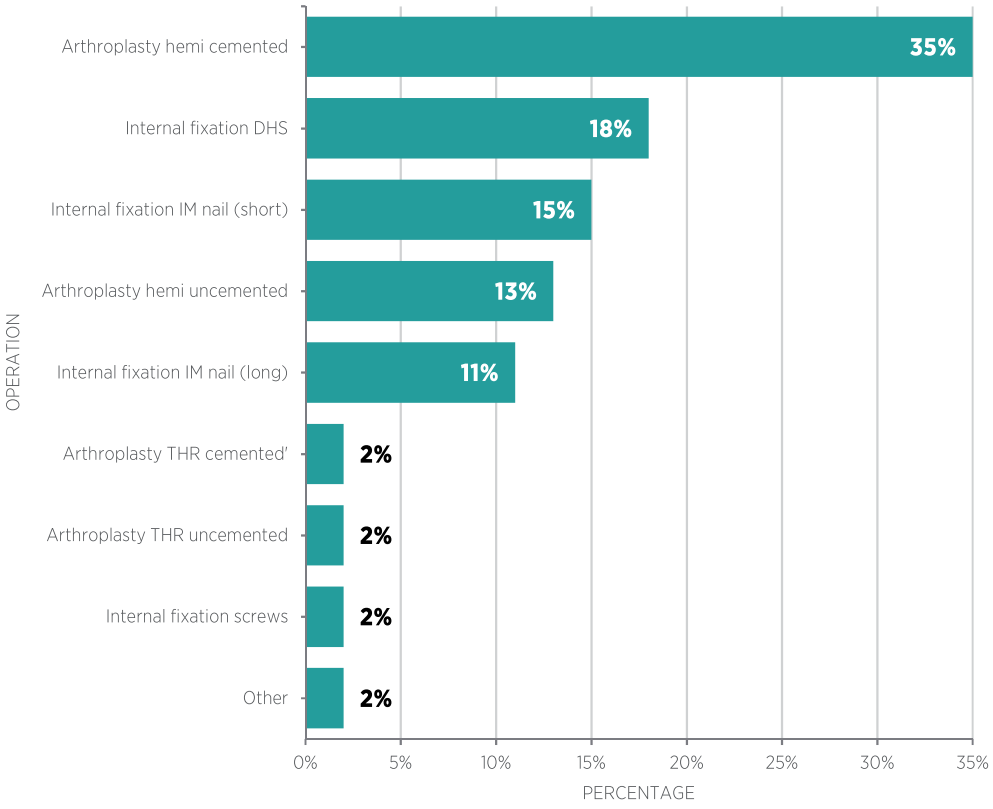


FIGURE 6.4: PERCENTAGE OF PATIENTS BY TYPE OF SURGERY (n=3554)[16*]

[16] 197 cases who did not have surgery have been excluded from the analysis.
* Please note: Percentages may not sum to 100% due to rounding.

TABLE 6.2: TYPE OF SURGERY BY FRACTURE TYPE (PERCENTAGES)

	Type of fracture			
Type of Operation	**Intracapsular (displaced)**	**Intracapsular (undisplaced)**	**Intertrochanteric**	**Subtrochanteric**
Internal fixation DHS	3%	17%	38%	6%
Internal fixation screws	0%	7%	1%	1%
Internal fixation IM nail (long)	1%	1%	18%	68%
Internal fixation IM nail (short)	1%	5%	36%	19%
Arthroplasty hemi cemented	62%	49%	4%	0%
Arthroplasty hemi uncemented	27%	12%	2%	0%
Arthroplasty THR cemented	3%	5%	0%	0%
Arthroplasty THR uncemented	3%	3%	0%	0%
Other	0%	1%	1%	6%
Total	**100%**	**100%**	**100%**	**100%**

Seventy-two percent of arthroplasties reported in 2018 were cemented (n=1312), which was similar to what was recorded in 2017 (Figure 6.5). However, there is a large proportion of patients receiving uncemented implants in a number of hospitals (Figure 6.5A).

The use of cemented prostheses is supported by the National Institute for Health and Care Excellence (NICE) in its clinical guideline, Hip fracture: management (NICE, 2011). It concludes that cement use has a statistically significant benefit in terms of mobility and pain (although the scale of this benefit may not be clinically significant). Since this guidance was published there have been significant improvements in uncemented implant technology and small clinical trials suggest greatly improved outcomes with contemporary uncemented implants without the risks of using bone cement. In 2015, in response to concerns relating to adverse cardiovascular events associated with cemented hemiarthroplasty, referred to as bone cement implantation syndrome (BCIS), NICE added further guidance to the safety guideline on reducing the risk from cemented hemiarthroplasty for hip fracture, from a collaborative multidisciplinary working group document produced by the Association of Anaesthetists of Great Britain and Ireland (AAGBI), the British Orthopaedic Association (BOA) and the British Geriatric Society (BGS), (Griffiths *et al*, 2015).

National registries and ongoing trials will be very helpful in this context, and are also likely to provide further valuable information. Due to the observational rather than randomised nature of the data, it will be vital to remove potential reporting biases and to collect sufficient information to allow for case mix adjustment.

In the near future, the IHFD intends to implement a complete list of implants for all hip fracture implants. This will facilitate comparison of implant type and design and allow investigation of changing trends.

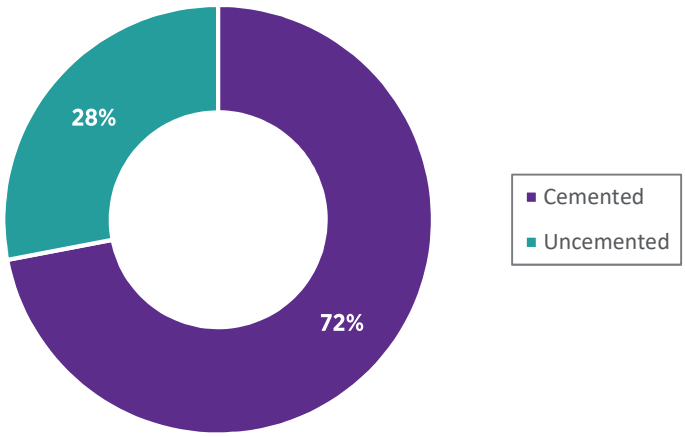


FIGURE 6.5: PERCENTAGE OF PATIENTS WITH CEMENTED AND UNCEMENTED ARTHROPLASTIES (N=1829)

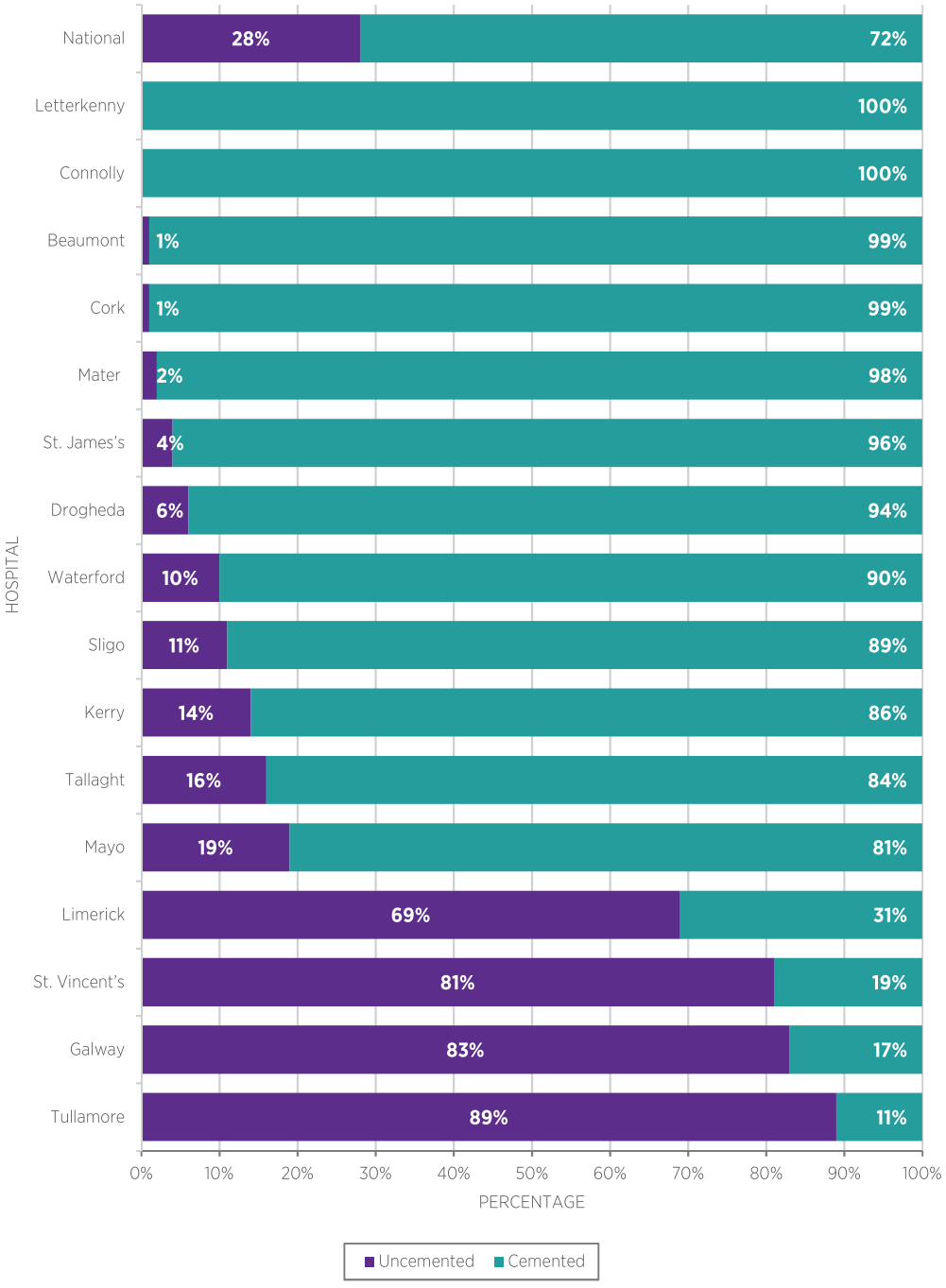


FIGURE 6.5A: PERCENTAGE OF PATIENTS WITH CEMENTED AND UNCEMENTED ARTHROPLASTIES, BY HOSPITAL (n=1829)*

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

MOBILISATION: DAY OF OR DAY AFTER SURGERY AND MOBILISED BY

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

Early mobilisation of hip fracture patients is a key measure of the standard of care and is directly linked to better outcomes (Dubljanin-Raspopović *et al*., 2013; Hirose *et al*., 2010). International guidelines recommend that all hip fracture patients receive a physiotherapy assessment on the day of or day after surgery (Australian and New Zealand Hip Fracture Registry, 2014; NICE, 2011; Waddell, 2011; Scottish Intercollegiate Guidelines Network, 2009). Figure 6.6 shows that 77% of patients were mobilised on the day of or the day after surgery: 74% (n=2617) of patients were mobilised by a physiotherapist and 3% (n=104) were mobilised by someone else ('other'). This has remained the same since 2017. Figure 6.6A displays this information at hospital level; the percentage of patients mobilised in each hospital on the day of or the day after surgery in 2018 ranged from 60% to 99%.

In the IHFD National Report 2016, almost 21% (n=624) of patients did not receive a physiotherapy assessment on the first postoperative day. The hip fracture facilities audit in 2016 showed that while all 16 hospitals had a physiotherapy service operating from Monday to Friday, only 6 out of 16 had a weekend physiotherapy service (two of which were only operational on Saturdays). The number of patients receiving a physiotherapy assessment ranges from 62% to 99% across the 16 participating hospitals (Figure 6.6B).

It is important to acknowledge that access to physiotherapy services remains suboptimal in some hospitals. Due to the important role early mobility plays in patient outcomes, the IHFD Governance Committee will introduce a new IHFS for assessment by a physiotherapist on the day of or day after surgery in 2020, with plans to link it to the BPT in 2021.

Gaining knowledge about transfer ability and functional independence is vital for rehabilitation and discharge planning. There is a need to quantify the function that occurs on the first postoperative day. The Cumulative Ambulatory Score (CAS) was added to the IHFD in 2016 to capture this information. Chapter 7 gives further information on functional outcomes using the CAS.

It is not possible to determine from the current dataset what factors influence a patient's ability to mobilise on the first postoperative day. A new data field will be added to the IHFD dataset to record reasons why a patient did not mobilise, which will include medical, patient, and service factors.

The IHFD Governance Committee encourages hospitals to adopt a culture of activity and functional independence similar to those rolled out in other areas of healthcare, such as the 'Get Up, Get Dressed, Get Moving ' and 'End PJ Paralysis' campaigns ongoing in the HSE (HSE, 2018).

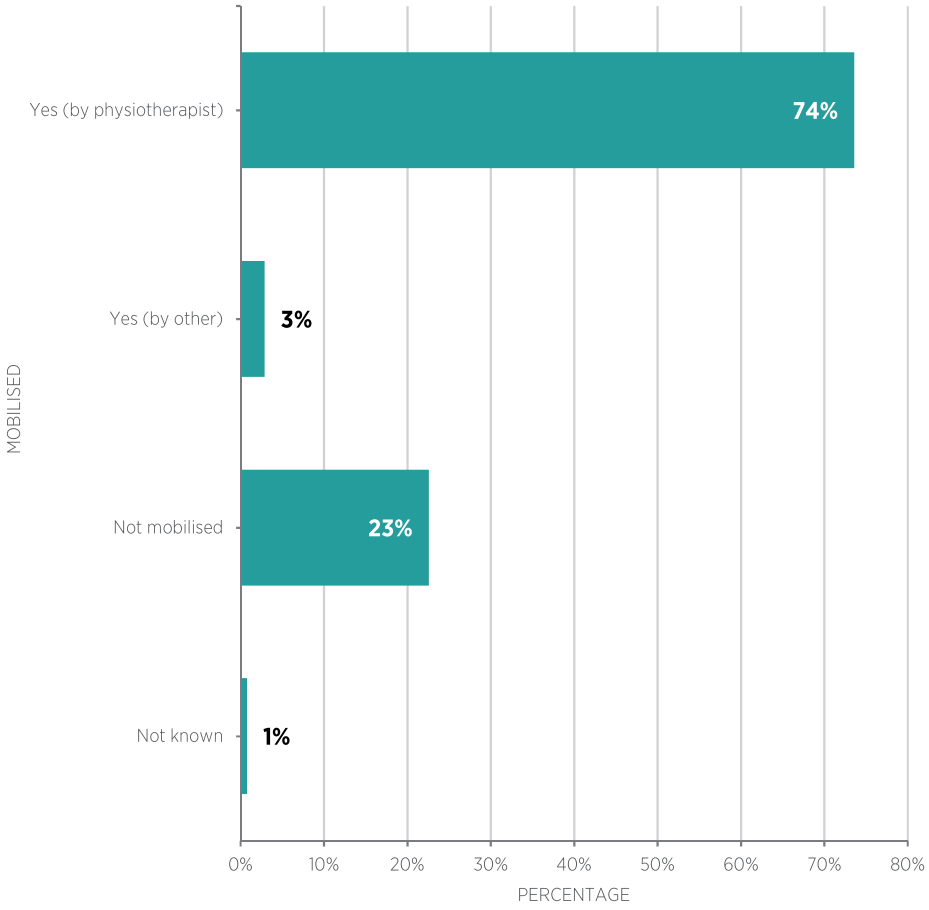


FIGURE 6.6: PERCENTAGE OF PATIENTS BY MOBILISATION DAY OF OR DAY AFTER SURGERY, AND MOBILISED BY (n=3554)[17]*

[17] 197 cases who did not have surgery have been excluded from the analysis.
* Please note: Percentages may not sum to 100% due to rounding.

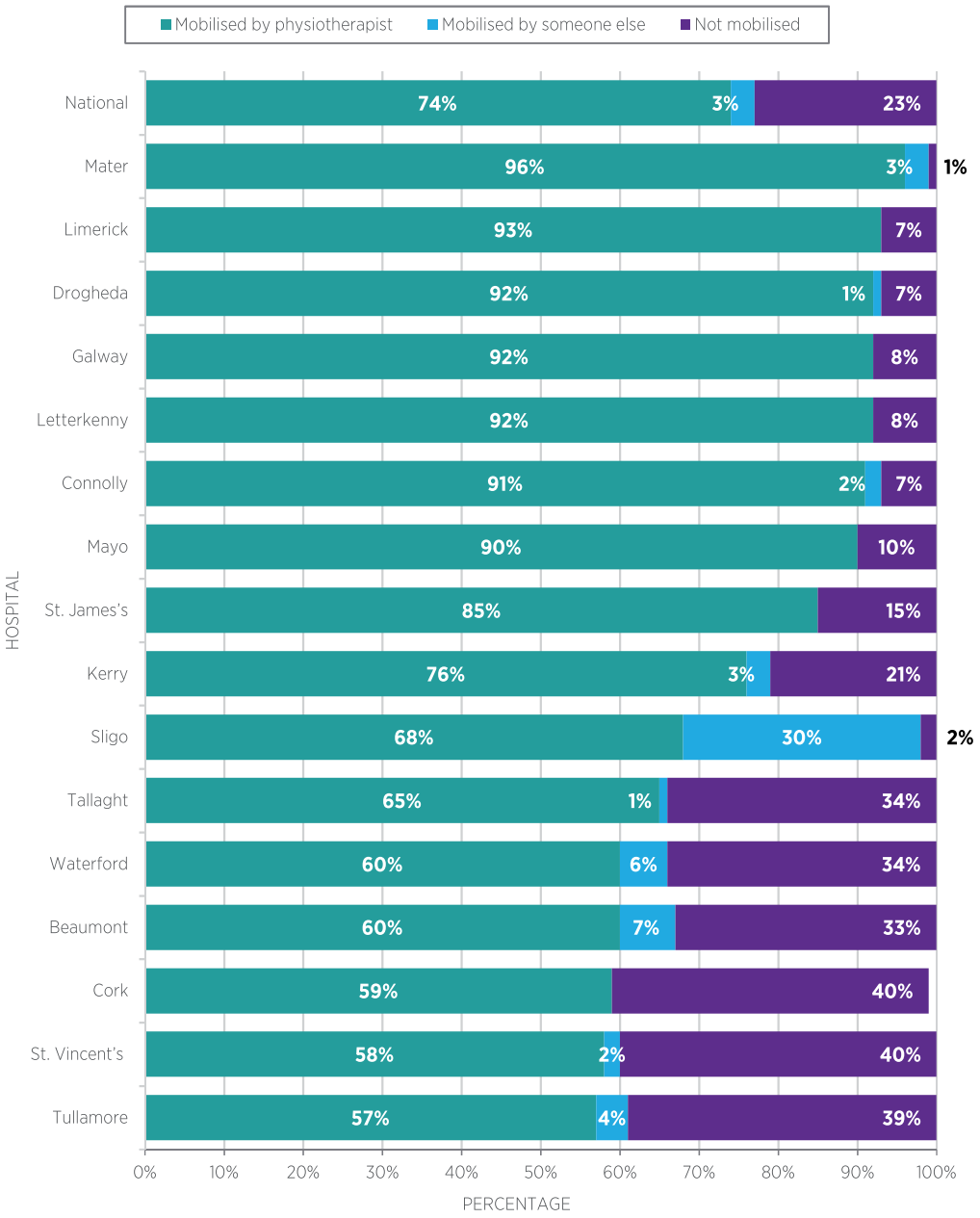


FIGURE 6.6A: PERCENTAGE OF PATIENTS WHO WERE MOBILISED BY A PHYSIOTHERAPIST OR WERE MOBILISED BY SOMEONE ELSE ON THE DAY OF OR DAY AFTER SURGERY, BY HOSPITAL (n=3524)[18] *

[18] 197 cases who did not have surgery and 30 cases who had 'not known' recorded have been excluded from the analysis.
* Please note: Percentages may not sum to 100% due to rounding.

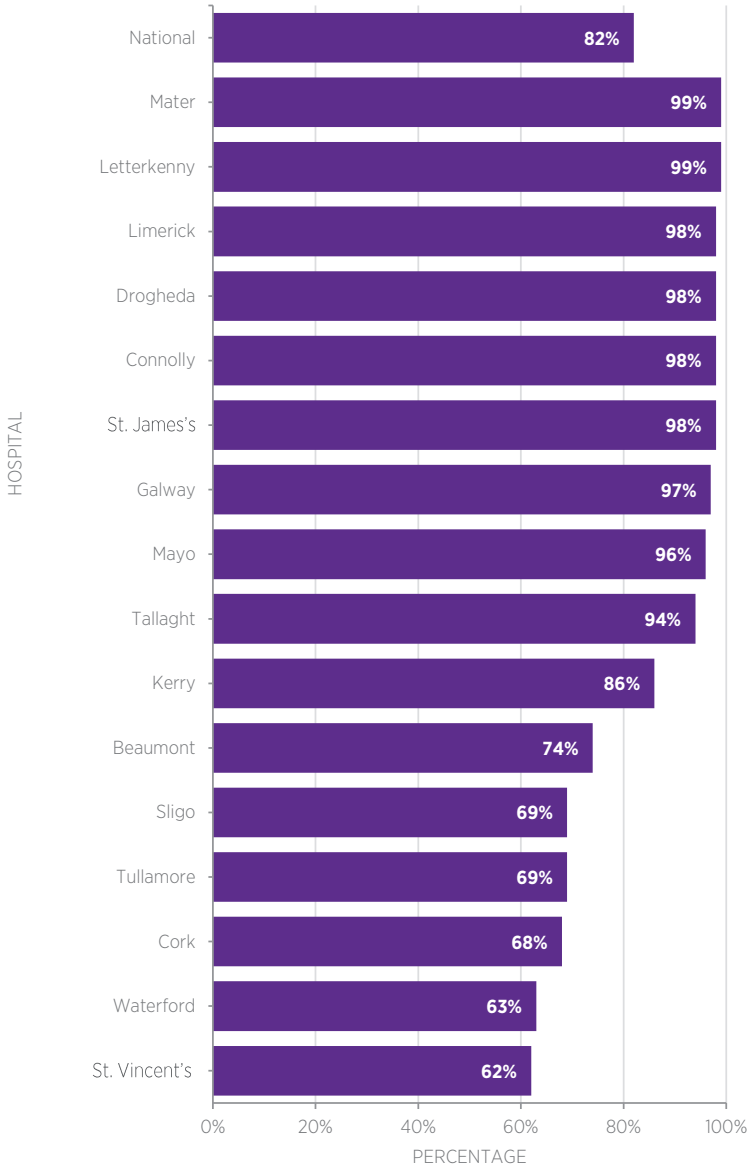


FIGURE 6.6B: PERCENTAGE OF PATIENTS WHO WERE ASSESSED BY A PHYSIOTHERAPIST ON THE DAY OF OR DAY AFTER SURGERY, BY HOSPITAL (n=3554)

KEY FINDINGS FROM CHAPTER 6

- Ninety-two percent (n=3468) of patients presented directly to an ED in an operating hospital.
- Over one-quarter (n=898) of patients received surgery more than 48 hours after their admission to hospital. The recording of the reason for delay in performing surgery needs to be improved.
- Forty-two percent (n=1489) of patients received their surgery within 24 hours.
- Seventy-two percent (n=1312) of arthroplasties reported in 2018 were cemented. However, there is a large proportion of patients receiving uncemented implants in several hospitals (Figure 6.5A).
- There continues to be a low rate of THR performed (4%) in comparison with other international hip fracture registers. The number of orthopaedic surgeons with arthroplasty surgery skills should be examined at a hospital level and theatre rosters planned to maximise the availability of that skill set for patients.
- Eighteen percent of patients did not receive a physiotherapy assessment on the first postoperative day. Hospitals not achieving this standard must review their physiotherapy services in order to enable this assessment on the first postoperative day for all hip fracture patients.

CHAPTER 7
OUTCOMES

CHAPTER 7: **OUTCOMES**

FUNCTIONAL OUTCOMES: CUMULATIVE AMBULATORY SCORE (CAS)

Functional outcomes, measured by the CAS, act as indicators of postoperative outcomes. This measure was introduced to the IHFD in 2016 as a validated measure for hip fracture patients (Kristensen *et al*., 2012; Kristensen *et al*., 2009). The main aim of management of a hip fracture is for the patient to return to their previous function, and this measure aims to capture that.

Data for the first postoperative day were missing for 40% (n=1427) of patients, while data for the day of discharge were missing for 48% (n=1716) of patients. While the data quality is improving for this measure, there continues to be a high proportion of missing or inaccurate data. Significant improvement in data quality is required in order to provide objective information regarding patient function throughout a hospital admission. This information is vital for local and national rehabilitation and discharge planning. For the analysis of this variable, only patients with a valid CAS for their first postoperative day and day of discharge were included (n=1677).

Figure 7.1 shows that 18% (n=304) of patients with CAS data recorded achieved independent mobility (a CAS of 6) by the day on which they were discharged from the acute hospital.

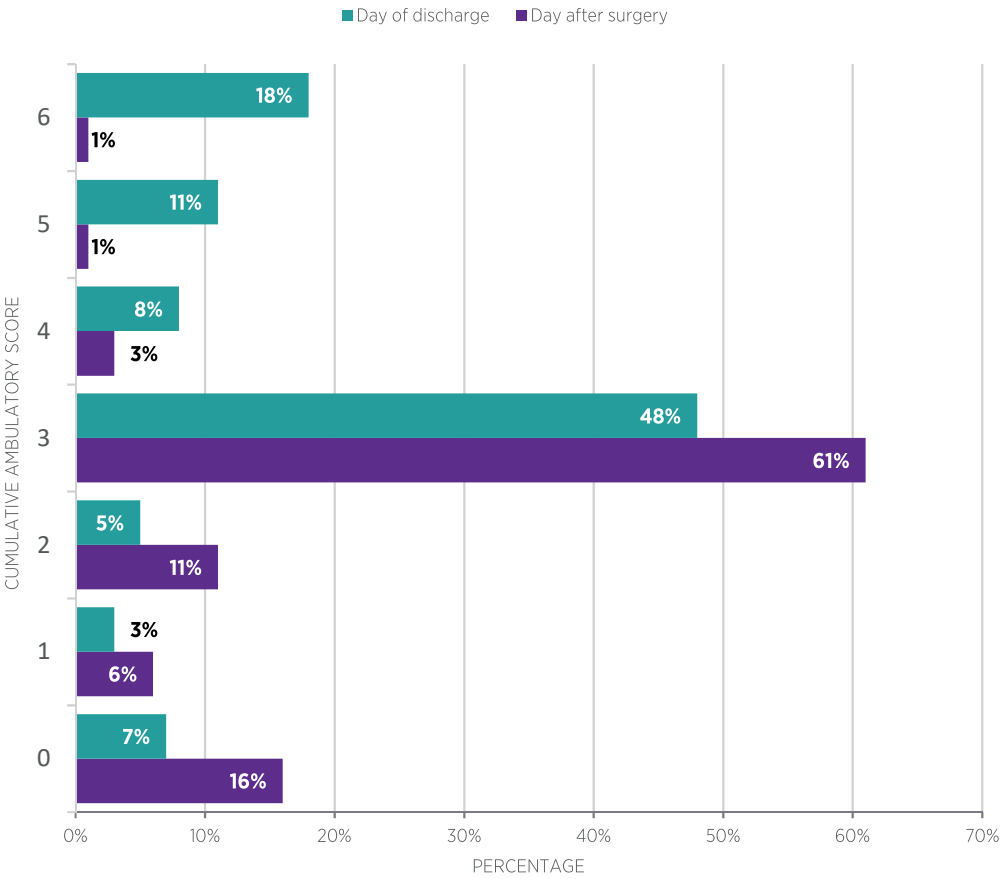


FIGURE 7.1: PERCENTAGE OF PATIENTS BY FUNCTIONAL OUTCOMES: CAS (n=1677)*

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

DESTINATION ON DISCHARGE

Figure 7.2 shows that 20% (n=735) of patients were discharged directly home from hospital; a further 31% (n=1168) required rehabilitation either at an on-site or off-site facility. Six percent (n=214) of patients were recorded as new admissions to a nursing home or long-stay care facility.

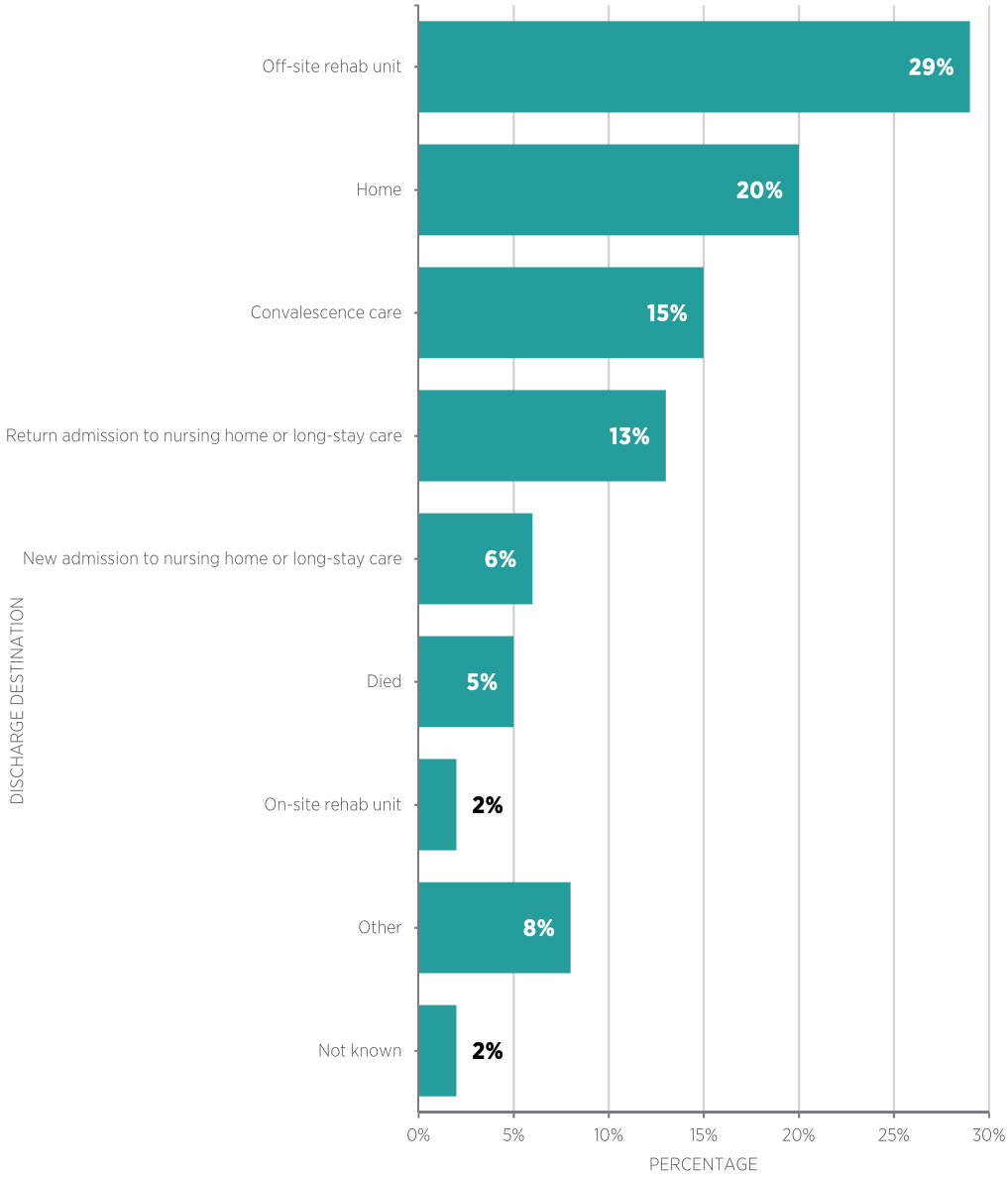


FIGURE 7.2: PERCENTAGE OF PATIENTS BY DESTINATION ON DISCHARGE (N=3751)*

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

CUMULATIVE LENGTH OF STAY

In 2018, the number of acute hospital bed days occupied by hip fracture patients was 70,231. Cumulative length of stay (LOS) 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 7.3 shows the cumulative percentages for the lengths of stay of all patients; 26% of patients were discharged within one week, and 60% within a fortnight. The mean and median LOS for hip fracture patients were 18.7 and 12.0 days, respectively. This represents a reduction of 1.3 days and 1 day from 2017, indicating a savings of approximately 900 acute bed days. When compared with a mean LOS in the UK of 15.5 days, 18.9 days in Wales and 13.5 days in Northern Ireland (NHFD, 2018), Ireland still has a way to go to reduce this LOS further.

One notable reason for a prolonged LOS in Ireland is in part related to the shortage of community and primary care services to enable people to go home and receive the care they require there. The IHFD welcomes the *Sláintecare Implementation Strategy* that was published by the Irish Government in 2018, which aims to provide "more care at home, or close to home in communities"(Department of Health, 2018). This offers the opportunity for two key areas to be addressed in relation to the IHFD. First, the prevention of harmful falls at home leading to hip fractures through the initiation of a home safety checklist and community falls prevention programmes. Second, through a properly resourced primary and community care system, more patients can be discharged home in a timely manner and fewer patients will require admission into long-term care facilities.

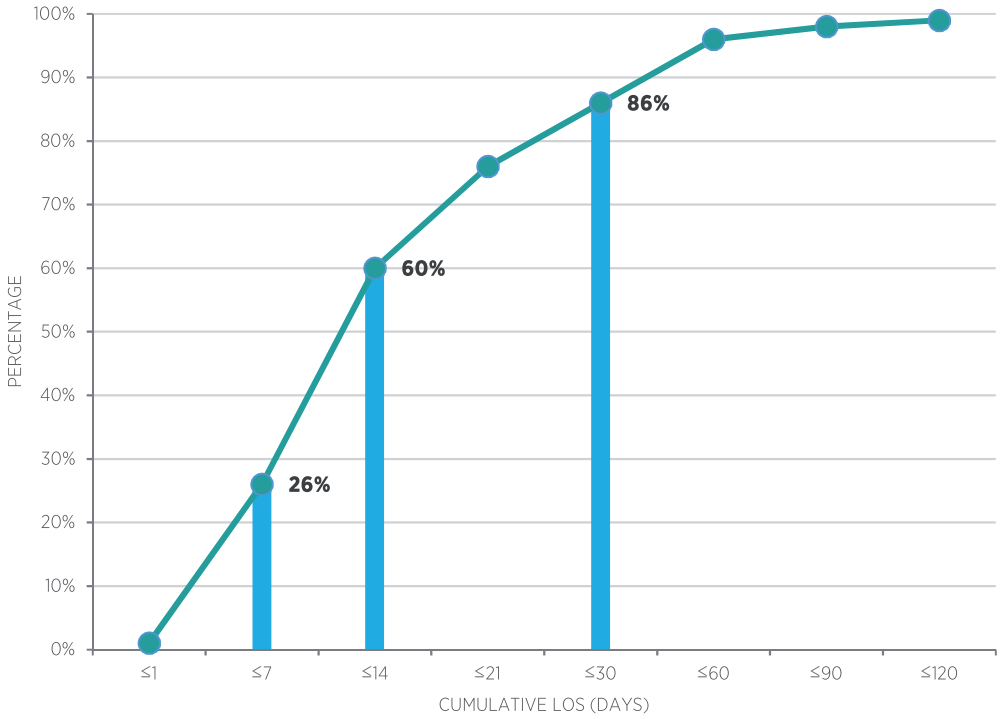


FIGURE 7.3: PERCENTAGE OF PATIENTS BY CUMULATIVE LENGTH OF STAY (LOS) (N3751)

RE-OPERATION WITHIN 30 DAYS

Re-operation acts as a marker of the quality of care. Figure 7.4 shows that 86% (n=3052) of patients were not re-operated on within 30 days. However, a large proportion of data was missing or not documented for this field (n=455, 13%). NOCA will work with IHFD data collectors to improve the coding of this question going forward. Patients are often discharged before 30 days, and therefore it may not be known if the patient returned to another hospital for surgery.

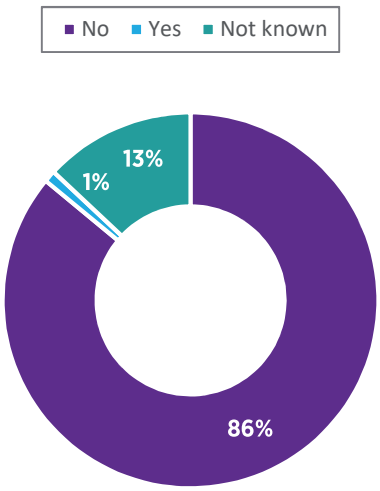


FIGURE 7.4: PERCENTAGE OF PATIENTS BY RE-OPERATION WITHIN 30 DAYS (n=3554)[19*]

[19] 197 cases who did not have surgery have been excluded from the analysis.
[*] Please note: Percentages may not sum to 100% due to rounding.

KEY FINDINGS FROM CHAPTER 7

- One in five patients (n=735) was discharged directly home from hospital; a further 31% (n=1168) required rehabilitation either at an on-site or off-site facility. Six percent (n=214) of patients were recorded as new admissions to a nursing home or long-stay care facility following discharge.

- The mean and median LOS for hip fracture patients were 18.7 and 12 days, respectively, which represents a reduction of approximately 900 acute bed days from 2017.

CHAPTER 8

AUDIT UPDATE

CHAPTER 8: **AUDIT UPDATE**

In 2018, the IHFD made a lot of progress, including improved coverage, the progress with hospital hip fracture governance committee (HFGC) developments, the advancement of orthogeriatric services, improvements in IHFS, and the introduction of the BPT. Part of the reason for such improvements is the increased visibility and recognition of the value of these data in the system. The IHFD 2017 report findings were presented at many national and international conferences during 2018: nationally at conferences for the Irish Gerontological Society (IGS), the National Falls and Bone Health Project (2018–2023) (AFFINITY), the Irish Association for Emergency Medicine (IAEM), the Irish Orthopaedic Association (IOA), and the Irish Society of Chartered Physiotherapists (ISCP), and internationally at the American Physical Therapy Association (APTA) Combines Sections Meeting 2019 and the 7th Fragility Fracture Network Global Congress in the Royal College of Surgeons in Ireland (RCSI), which was a huge achievement for the IHFD team, as many were involved in securing the bid to bring this prestigious congress to Dublin. Additionally, the IHFD submission "From Broken Bone to Walking Home – A National Hip Fracture Physiotherapy Quality Improvement Initiative" was a semi-finalist in the national HSCP Best Practice and Innovation Awards 2018.

At the Irish hip fracture conference in November 2018, each participating hospital was invited to present its local quality improvement projects using its data, and the value and outputs of these projects were a testament to the enthusiasm, passion and commitment of the healthcare teams in all of the hospitals towards providing high-quality hip fracture care.

The data have been used throughout the year for several research projects, including 'Predictors of in-hospital mortality post hip fracture in Ireland 2013–2017', the results of which will be published later this year. The data have also been used for service evaluation purposes; for example, in support of the national reconfiguration of trauma services in Ireland.

Throughout the year, monthly teleconferences are held between the IHFD Audit Manager and the coordinators. In addition, the Audit Manager attended several HFGC hospital meetings, including at University Hospital Galway, University Hospital Waterford, and Our Lady of Lourdes Hospital, Drogheda. The annual IHFD workshop was held on 2 May 2019 in the RCSI, primarily for the audit coordinators. The IHFD Audit Manager gave an update on the progress of the audit followed by a talk from a consultant anaesthetist on oral anticoagulants and hip fracture surgery. A practical workshop looking at hip fracture implants with a consultant orthopaedic surgeon was also held. University Hospital Limerick presented a quality improvement project aimed at improving patient care and throughput in the ED for patients with hip fractures. A two-hour co-design workshop with the Quality Improvement Division, HSE team, focusing on the development of a programme of quality improvement for the hospitals participating in the IHFD, ended a very productive day.

In 2019, several key developments will be taking place for the audit, including:

- completion of the IHFD data dictionary
- updated quarterly hospital reports
- completion of an in-depth report on Health Information and Quality Authority (HIQA) data quality dimensions
- development of robust validation reports and dashboards
- IHFD quality improvement programme
- further public and patient involvement.

CHAPTER 9

RECOMMENDATIONS AND CONCLUSIONS

CHAPTER 9: **RECOMMENDATIONS AND CONCLUSIONS**

RECOMMENDATIONS

IHFD STRATEGIC FOCUS

- The IHFD team will further align our focus, recommendations and work to the Sláintecare programme to improve the quality of hip fracture care for people from home to home, promote health to prevent further falls and fractures, and provide timely access to care: "Right care, Right place, Right time, Right team". We will continue to measure and publish our performance in order to inform and create a system that works for patients and the changing needs of the population.

HOSPITAL GOVERNANCE

- Each hospital HFGC will engage in quality improvement, using the quarterly IHFD hospital and BPT reports to increase compliance with the IHFS.

CLINICAL CARE

- Hospital HFGCs will focus on admitting patients to an orthopaedic ward or for surgery within four hours of presentation.
- Hospital HFGCs will continue to develop multidisciplinary orthogeriatric services.
- All hospitals will focus on increasing the number of patients assessed and mobilised by a physiotherapist on day one after their surgery
- All healthcare staff should promote a culture of activity and functional independence among hip fracture patients and their carers.
- Hospital HFGCs will focus on increasing the number of patients going home after a hip fracture and reducing the number of patients going into long-term care.
- The Institute of Trauma and Orthopaedics will review the level of variation in types of implants, including cemented/uncemented prostheses and THRs being undertaken in the hip fracture population.

DATA QUALITY

- Hospitals will submit data in a timely manner to achieve 90% data coverage quarterly and annually.
- NOCA will build robust data validation reports and provide improved quarterly reports for the IHFD to the participating hospitals.

IHFD DEVELOPMENTS

- NOCA will continue to progress the development of long-term outcome measures for the IHFD.
- NOCA should increase the level of patient and public involvement in the development and progress of the IHFD.

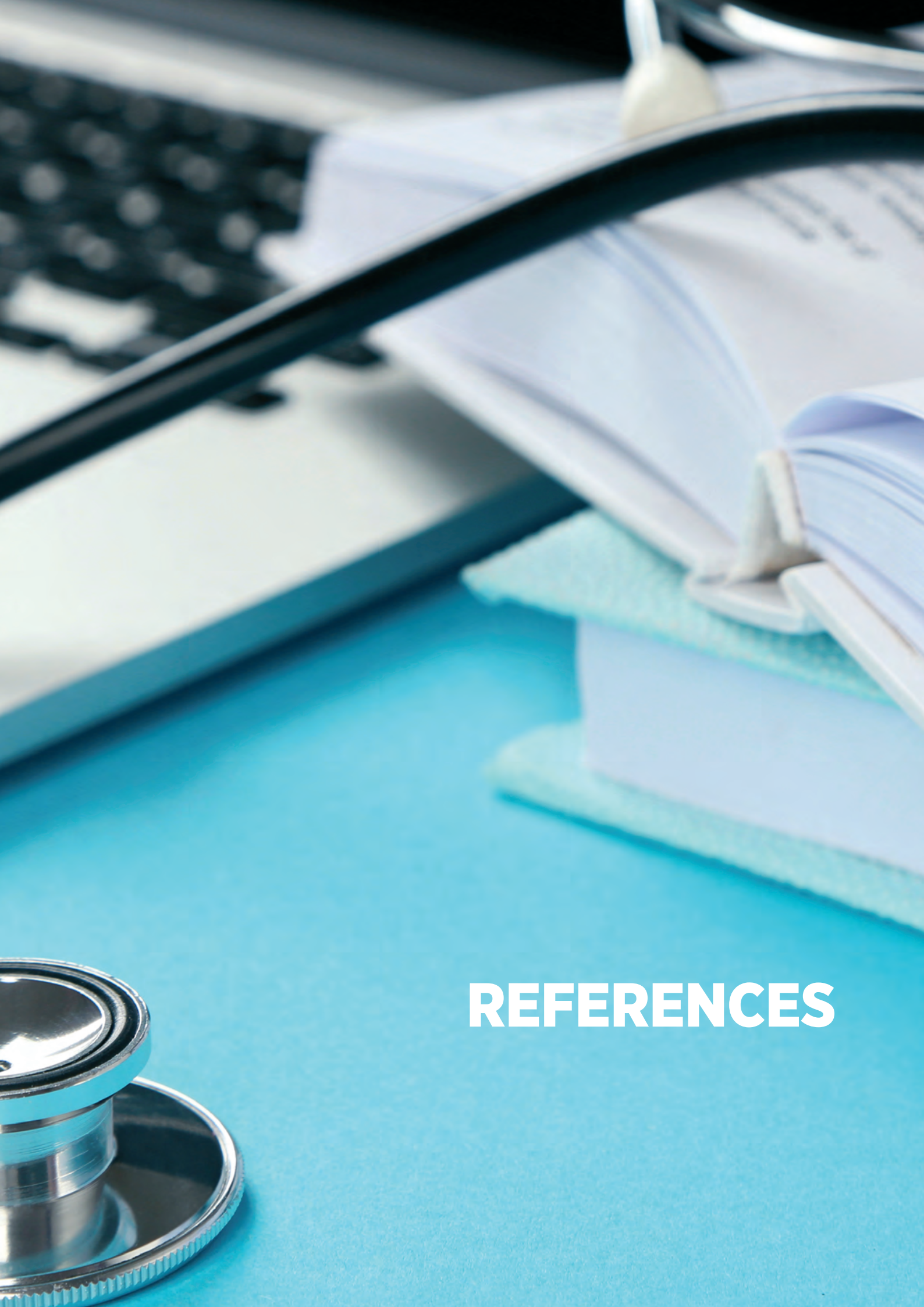
CONCLUSION

This report has shown that, as a maturing audit, the IHFD is now facilitating changes in the health system on a local, public, national and system level. The engagement of healthcare staff with the audit is having a visible impact on patient care and service delivery. The hospital stories in Chapter 4 highlight the real value of these data and how they can be used for local quality improvement in participating hospitals.

Some key achievements highlighted in this report include the ongoing success of the national hip fracture bypass, the increased development of hospital HFGCs, the development of orthogeriatric services across the country, and, most notably, hip fracture being the first condition to successfully implement a BPT.

Moreover, the improvements in data coverage, local governance, and compliance with the IHFS show that the momentum of this audit is growing all the time. Thanks to the clinical leadership of the hospital clinical leads and the data collection and dedication of the audit coordinators, this audit is leading the way for many other national clinical audits.

The next step for the IHFD will include better reporting and validation processes and alignment with the Sláintecare programme in order to improve the quality of hip fracture care for people from home to home, promote health to prevent further falls and fractures, and provide timely access to care: “Right care, Right place, Right time, Right team”.



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APPENDICES

APPENDIX 1: IHFD DATASET

HIPE Portal Data Entry/Hip Fracture Admission (V7.0.1) 11 December 2018

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 (V7.0.1) 11 December 2018

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
7B. Delirium assessment 4AT Day 1	1 Yes, 2 No
7B2. If yes, enter score	00 - 12
7C. Delirium assessment 4AT Day 3	1 Yes, 2 No
7C2. If yes, enter score	00 - 12
7D. Delirium assessment at any other time	1 Yes, 2 No
7D2. If yes, enter score	00 - 12
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

APPENDIX 1: IHFD DATASET

HIPE Portal Data Entry/Hip Fracture Admission (V7.0.1) 11 December 2018

Question	Options
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
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)	
14A2. Type of implant (fx type = intertrochanter)	
14A3. Type of implant (fx type = periprosthetic)	
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 (V7.0.1) 11 December 2018

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 (V7.0.1) 11 December 2018

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 DXA 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
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 IHFD (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**
What constitutes admission to orthopaedic ward?	Includes dedicated orthopaedic/trauma wards or dedicated geriatrician-staffed hip fracture wards. Enter 'orthopaedic ward' if the patient was an inpatient on an orthopaedic ward at any time during the acute hip fracture spell.
What is the AMT Score (Abbreviated Mental Test Score)?	TThis 10-item version is a simple and robust screening tool for the acute patient. Full assessment for confused people (AMT Score less than 7) requires more detailed tools for cognition (Mini Mental State Exam) or presence of delirium (4AT).
What fracture type is classed as intertrochanteric?	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.
What is an 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 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 with or 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.
What are the 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. (If this option is selected a freetext box will appear on the database to be populated with a brief description of the medical issues) • 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
What definition of pressure ulcer is used 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.
What is the 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).
What is a 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.
What is the 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 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 V7.0.1 for Question (Q) references

FIGURE 4.2 IHFS 1: PERCENTAGE OF PATIENTS ADMITTED FROM THE ED TO AN ORTHOPAEDIC WARD WITHIN FOUR HOURS OR ADMITTED TO THEATRE FROM ED WITHIN FOUR HOURS, BY INDIVIDUAL HOSPITAL, IN 2017 (N=3497) AND 2018 (N=3751)

	2017			2018		
HOSPITAL	n	N	%	n	N	%
Sligo University Hospital	62	134	46%	49	115	43%
Letterkenny University Hospital	48	148	32%	44	140	31%
Mayo University Hospital	26	82	32%	45	146	31%
Cork University Hospital	10	456	2%	140	455	31%
University Hospital Limerick	75	297	25%	88	324	27%
St. Vincent's University Hospital	15	324	5%	77	358	22%
Midland Regional Hospital, Tullamore	31	215	14%	38	228	17%
Our Lady of Lourdes Hospital, Drogheda	6	202	3%	33	219	15%
Connolly Hospital Blanchardstown	27	212	13%	27	220	12%
Beaumont Hospital	24	205	12%	23	205	11%
St James's Hospital	15	146	10%	11	164	7%
University Hospital Kerry	10	146	7%	10	157	6%
University Hospital Waterford	25	356	7%	29	426	7%
University Hospital Galway	7	236	3%	14	229	6%
Tallaght University Hospital	6	185	3%	7	201	3%
Mater Misericordiae University Hospital	<5	153	1%	<5	164	1%
Total	**389**	**3497**	**11%**	**637**	**3751**	**17%**

FIGURE 4.3 IHFS 2: PERCENTAGE OF PATIENTS RECEIVING SURGERY WITHIN 48 HOURS (AND WITHIN NORMAL WORKING HOURS) BY INDIVIDUAL HOSPITAL, IN 2017 (n=3336) AND 2018 (n=3554)

	2017			2018		
HOSPITAL	n	N	%	n	N	%
St. Vincent's University Hospital	290	314	92%	322	338	95%
Connolly Hospital	168	209	80%	177	213	83%
Tallaght University Hospital	149	173	86%	156	190	82%
Mater Misericordiae University Hospital	85	138	62%	121	156	78%
St. James's Hospital, Dublin	101	141	72%	124	158	78%
Letterkenny University Hospital	100	144	69%	106	136	78%
Midland Regional Hospital, Tullamore	145	209	69%	165	214	77%
Galway University Hospital	164	223	74%	162	217	75%
Beaumont Hospital	134	192	70%	145	196	74%
Cork University Hospital	233	422	55%	310	430	72%
Mayo University Hospital	65	79	82%	96	134	72%
Sligo University Hospital	102	133	77%	81	115	70%
Our Lady of Lourdes Hospital, Drogheda	116	187	62%	131	201	65%
University Hospital Kerry	97	138	70%	88	142	62%
University Hospital Waterford	211	351	60%	221	416	53%
University Hospital Limerick	158	283	56%	156	298	52%
Total	**2318**	**3336**	**69%**	**2561**	**3554**	**72%**

APPENDIX 4: FREQUENCY TABLES

See Appendix 1: Dataset V7.0.1 for Question (Q) references

FIGURE 4.4 IHFS 3: PERCENTAGE OF PATIENTS WHO DEVELOPED PRESSURE ULCERS FOLLOWING ADMISSION, BY INDIVIDUAL HOSPITAL, IN 2017 (n=3320) AND 2018 (n=3567)

	2017			2018		
HOSPITAL	n	N	%	n	N	%
Connolly Hospital Blanchardstown	5	207	2%	<5	213	0%
University Hospital Waterford	8	343	2%	<5	409	0%
Cork University Hospital	<5	424	1%	<5	439	1%
University Hospital Kerry	<5	137	2%	<5	151	1%
University Hospital Galway	<5	222	2%	<5	215	2%
Sligo University Hospital	<5	133	2%	<5	113	2%
Our Lady of Lourdes Hospital, Drogheda	<5	192	2%	6	204	3%
Letterkenny University Hospital	<5	140	3%	<5	132	3%
Mater Misericordiae University Hospital	<5	139	3%	<5	157	3%
Mayo University Hospital	5	80	6%	<5	141	3%
St. Vincent's University Hospital	<5	312	1%	9	335	3%
Tallaght University Hospital	<5	175	2%	5	184	3%
University Hospital Limerick	6	285	2%	12	309	4%
Midland Regional Hospital, Tullamore	8	207	4%	9	219	4%
Beaumont Hospital	13	189	7%	15	194	8%
St James's Hospital	10	135	7%	18	152	12%
Total	**85**	**3320**	**3%**	**101**	**3567**	**3%**

FIGURE 4.5 IHFS 4: PERCENTAGE OF PATIENTS SEEN BY A GERIATRICIAN DURING ADMISSION, BY INDIVIDUAL HOSPITAL, IN 2017 (N=3497) AND 2018 (N=3751)

	2017			2018		
HOSPITAL	n	N	%	n	N	%
Mater Misericordiae University Hospital	127	153	83%	162	164	99%
St. Vincent's University Hospital	305	324	94%	339	358	95%
Beaumont Hospital	192	205	94%	191	205	93%
University Hospital Waterford	178	356	50%	389	426	91%
St. James's Hospital, Dublin	98	146	67%	148	164	90%
Sligo University Hospital	60	134	45%	92	115	80%
Midland Regional Hospital, Tullamore	171	215	80%	181	228	79%
University Hospital Limerick	248	297	84%	253	324	78%
Galway University Hospital	61	236	26%	166	229	72%
Cork University Hospital	119	456	26%	267	455	59%
Letterkenny University Hospital	14	148	10%	80	140	57%
Tallaght University Hospital	80	185	43%	113	201	56%
Connolly Hospital	72	212	34%	80	220	36%
Mayo University Hospital	8	82	10%	51	146	35%
Our Lady of Lourdes Hospital, Drogheda	12	202	6%	73	219	33%
University Hospital Kerry	9	146	6%	<5	157	3%
Total	**1754**	**3497**	**50%**	**2589**	**3751**	**69%**

APPENDIX 4: FREQUENCY TABLES

See Appendix 1: Dataset V7.0.1 for Question (Q) references

FIGURE 4.6 IHFS 5: PERCENTAGE OF PATIENTS WHO RECEIVED A BONE HEALTH ASSESSMENT IN 2018 (n=3567)

BONE HEALTH ASSESSMENT	n	%
Started on this admission	1629	46%
Continued from pre-admission	561	16%
Awaits outpatient assessment	462	13%
Awaits DXA scan	198	6%
Assessed – no bone protection medication needed/appropriate	142	4%
No assessment	541	15%
Unknown	34	1%
Total	**3567**	**100**

FIGURES 4.6A IHFS 5: PERCENTAGE OF PATIENTS WHO RECEIVED A BONE HEALTH ASSESSMENT, BY HOSPITAL, IN 2017 (n=3320) AND 2018 (n=3567)

	2017			2018		
HOSPITAL	n	N	%	n	N	%
Mater Misericordiae University Hospital	130	139	94%	157	157	100%
Cork University Hospital	201	424	47%	429	439	98%
Letterkenny University Hospital	139	140	99%	130	132	98%
St. Vincent's University Hospital	305	312	98%	326	335	97%
Midland Regional Hospital, Tullamore	192	207	93%	210	219	96%
Sligo University Hospital	70	133	53%	108	113	96%
St James's Hospital	112	135	83%	146	152	96%
Tallaght University Hospital	170	175	97%	176	184	96%
Beaumont Hospital	173	189	92%	183	194	94%
University Hospital Galway	195	222	88%	203	215	94%
University Hospital Waterford	179	343	52%	384	409	94%
University Hospital Limerick	275	285	96%	251	309	81%
Connolly Hospital Blanchardstown	111	207	54%	124	213	58%
Our Lady of Lourdes Hospital, Drogheda	40	192	21%	80	204	39%
University Hospital Kerry	75	137	55%	50	151	33%
Mayo University Hospital	40	80	50%	35	141	25%
Total	**2407**	**3320**	**73%**	**2992**	**3567**	**84%**

APPENDIX 4: FREQUENCY TABLES

See Appendix 1: Dataset V7.0.1 for Question (Q) references

FIGURES 4.7 IHFS 6: PERCENTAGE OF PATIENTS WHO RECEIVED A SPECIALIST FALLS ASSESSMENT, BY INDIVIDUAL HOSPITAL, IN 2017 (n=3320) AND 2018 (n=3567)

HOSPITAL	2017			2018		
	n	N	%	n	N	%
Mater Misericordiae University Hospital	125	139	90%	155	157	99%
St. Vincent's University Hospital	307	312	98%	327	335	98%
St. James's Hospital	89	135	66%	148	152	97%
Beaumont Hospital	182	189	96%	187	194	96%
Letterkenny University Hospital	123	140	88%	123	132	93%
University Hospital Waterford	129	343	38%	360	409	88%
Sligo University Hospital	55	133	41%	94	113	83%
Midland Regional Hospital, Tullamore	163	207	79%	175	219	80%
University Hospital Limerick	249	285	87%	243	309	79%
Galway University Hospital	0	222	0%	140	215	65%
Our Lady of Lourdes Hospital, Drogheda	6	192	3%	129	204	63%
Tallaght University Hospital	13	175	7%	88	184	48%
Cork University Hospital	62	424	15%	199	439	45%
Mayo University Hospital	<5	80	1%	51	141	36%
Connolly Hospital	31	207	15%	57	213	27%
University Hospital Kerry	11	137	8%	7	151	5%
Total	**1546**	**3320**	**47%**	**2483**	**3567**	**70%**

FIGURE 5.1: PERCENTAGE OF PATIENTS BY GENDER AND AGE GROUP (N=3751)

GENDER	60-69		70-79		80-89		90+		Total	
	n	%	n	%	n	%	n	%	n	%
Male	186	39%	387	35%	451	29%	141	24%	1165	31%
Female	290	61%	721	65%	1128	71%	447	76%	2586	69%
Total	**476**	**100%**	**1108**	**100%**	**1579**	**100%**	**588**	**100%**	**3751**	**100%**

APPENDIX 4: FREQUENCY TABLES

See Appendix 1: Dataset V7.0.1 for Question (Q) references

FIGURE 5.2: PERCENTAGE OF PATIENTS BY AGE GROUP AND SOURCE OF ADMISSION TO HOSPITAL (N=3751)

ADMISSION SOURCE	60-69		70-79		80-89		90+		Total	
	n	%	n	%	n	%	n	%	n	%
Home	414	87%	955	86%	1298	82%	448	76%	3115	83%
Transfer from nursing home	16	3%	70	6%	181	11%	104	18%	371	10%
Transfer from hospital in HIPE	41	9%	75	7%	90	6%	34	6%	240	6%
Other	5	1%	8	1%	10	1%	2	0%	25	1%
Total	**476**	**100%**	**1108**	**100%**	**1579**	**100%**	**588**	**100%**	**3751**	**100**

FIGURE 5.3: LEVEL OF COGNITION OF PATIENTS WITH A RECORDED AMT SCORE (n=509)

LEVEL OF COGNITION	n	%
0–6: cognitive impairment	125	25%
7–10: normal cognition	384	75%
Total	**509**	**100%**

FIGURE 5.4: ASA GRADE FOR PATIENTS WITH A RECORDED SCORE BY AGE GROUP (n=3294)

ASA GRADE	60-69		70-79		80-89		90+		Total	
	n	%	n	%	n	%	n	%	n	%
1	45	10%	52	5%	36	3%	11	2%	144	4%
2	213	50%	428	44%	438	32%	129	25%	1208	37%
3	153	36%	431	45%	813	59%	321	62%	1718	52%
4	18	4%	50	5%	87	6%	60	12%	215	7%
5	0	0%	2	0%	7	1%	0	0%	9	0%
Total	**429**	**100%**	**963**	**100%**	**1381**	**100%**	**521**	**100%**	**3294**	**100%**

FIGURE 5.5: PRE-FRACTURE LEVEL OF MOBILITY FOR PATIENTS RECORDED WITH A TOTAL NMS BY AGE GROUP (n=3506)

FUNCTIONAL MOBILITY	60-69		70-79		80-89		90+		Total	
	n	%	n	%	n	%	n	%	n	%
Low functional mobility	115	26%	398	38%	852	58%	428	78%	1793	51%
High functional mobility	330	74%	639	62%	620	42%	124	22%	1713	49%
Total	**445**	**100%**	**1037**	**100%**	**1472**	**100%**	**552**	**100%**	**3506**	**100%**

APPENDIX 4: FREQUENCY TABLES

See Appendix 1: Dataset V7.0.1 for Question (Q) references

FIGURE 5.6: PRE-FRACTURE LEVEL OF MOBILITY WITHIN THREE FUNCTIONAL ACTIVITIES (NMS) (n=3506)

INDOOR WALKING	n	%
Unable	53	2%
Assistance of one person	266	8%
With an aid	1289	37%
Independent	1898	54%
Outdoor walking		
Unable	347	10%
Assistance of one person	379	11%
With an aid	1144	33%
Independent	1636	47%
Shopping		
Unable	974	28%
Assistance of one person	312	9%
With an aid	700	20%
Independent	1520	43%
Total	**3506**	**100%**

FIGURE 5.7: PERCENTAGE OF PATIENTS WITH EACH TYPE OF FRACTURE (N=3751)

FRACTURE TYPE	n	%
Intracapsular (displaced)	1408	38%
Intertrochanteric	1330	35%
Intracapsular (undisplaced)	486	13%
Subtrochanteric	201	5%
Periprosthetic	79	2%
Other	83	2%
Not known	164	4%
Total	**3751**	**100%**

FIGURE 6.1: MODE OF ADMISSION TO OPERATING HOSPITAL (N=3751)

MODE OF ADMISSION	N	%
Directly to ED in an operating hospital	3468	92%
Seen by an orthopaedic team	261	7%
Not known	22	1%
Total	**3751**	**100%**

APPENDIX 4: FREQUENCY TABLES

See Appendix 1: Dataset V7.0.1 for Question (Q) references

FIGURES 6.1A: MODE OF ADMISSION TO OPERATING HOSPITAL, BY HOSPITAL (N=3751)

	Via ED-Directly		Seen by an Orthopaedic team		Not Known		Total	
HOSPITAL	n	%	n	%	n	%	n	%
Connolly Hospital	188	85%	32	15%	0	0%	220	100%
Midland Regional Hospital, Tullamore	224	98%	<5	1%	<5	1%	228	100%
University Hospital Limerick	314	97%	7	2%	<5	1%	324	100%
Letterkenny University Hospital	134	96%	5	4%	<5	0%	140	100%
Sligo University Hospital	111	97%	<5	3%	0	0%	115	100%
University Hospital Waterford	310	73%	116	27%	0	0%	426	100%
Cork University Hospital	437	96%	18	4%	0	0%	455	100%
University Hospital Kerry	155	99%	<5	1%	0	0%	157	100%
Galway University Hospital	207	90%	14	6%	8	3%	229	100%
Mayo University Hospital	142	97%	<5	2%	<5	1%	146	100%
St. James's Hospital, Dublin	154	94%	10	6%	0	0%	164	100%
Mater Misericordiae University Hospital	159	97%	5	3%	0	0%	164	100%
St. Vincent's University Hospital	345	96%	13	4%	0	0%	358	100%
Our Lady of Lourdes Hospital, Drogheda	208	95%	11	5%	0	0%	219	100%
Beaumont Hospital	191	93%	10	5%	<5	2%	205	100%
Tallaght University Hospital	189	94%	9	4%	<5	1%	201	100%
Total	**3468**	**92%**	**261**	**7%**	**22**	**1%**	**3751**	**100%**

FIGURE 6.2: CUMULATIVE TIME TO SURGERY (n=3519)

SURGERY TIME	Cumulative n	Cumulative %
<12 hours	185	5%
<24 hours	1489	42%
<36 hours	2098	60%
<48 hours	2621	74%
<60 hours	2846	81%
<72 hours	3096	88%
<84 hours	3196	91%
<96 hours	3289	93%
<108 hours	3326	95%
<120 hours	3378	96%
Total	**3519**	**100%**
Not known	35	

APPENDIX 4: FREQUENCY TABLES

See Appendix 1: Dataset V7.0.1 for Question (Q) references

FIGURE 6.3: PERCENTAGE OF PATIENTS BY TYPE OF ANAESTHESIA (n=3554)

TYPE OF ANAESTHESIA	n	%
GA only	489	14%
GA and nerve block	317	9%
GA and SA	79	2%
GA and epidural anaesthesia	7	0%
SA only	1866	53%
SA and nerve block	767	22%
SA and epidural (CSE)	8	0%
Other	5	0%
Not known	16	0%
Total	**3554**	**100**

FIGURE 6.3A: PERCENTAGE OF PATIENTS BY TYPE OF ANAESTHESIA, BY HOSPITAL (n=3533)

	GA		SA		Both		Total	
HOSPITAL	n	%	n	%	n	%	n	%
Connolly Hospital Blanchardstown	60	28%	117	55%	36	17%	213	100%
Midland Regional Hospital, Tullamore	35	16%	178	83%	<5	0%	214	100%
University Hospital Limerick	16	5%	281	94%	<5	0%	298	100%
Letterkenny University Hospital	17	13%	111	82%	8	6%	136	100%
Sligo University Hospital	24	21%	89	77%	<5	2%	115	100%
University Hospital Waterford	26	6%	388	93%	<5	0%	415	100%
Cork University Hospital	43	10%	380	89%	6	1%	429	100%
University Hospital Kerry	15	11%	123	88%	<5	1%	139	100%
University Hospital Galway	54	25%	152	71%	9	4%	215	100%
Mayo University Hospital	31	23%	102	77%	0	0%	133	100%
St James's Hospital	58	39%	87	58%	<5	3%	149	100%
Mater Misericordiae University Hospital	116	74%	39	25%	<5	1%	156	100%
St. Vincent's University Hospital	138	41%	196	58%	<5	1%	338	100%
Our Lady of Lourdes Hospital, Drogheda	46	23%	152	76%	<5	1%	200	100%
Beaumont Hospital	57	29%	138	71%	0	0%	195	100%
Tallaght University Hospital	77	41%	108	57%	<5	2%	188	100%
Total	**813**	**23%**	**2641**	**75%**	**79**	**2%**	**3533**	**100%**

FIGURE 6.4: PERCENTAGE OF PATIENTS BY TYPE OF SURGERY (n=3554)

TYPE OF OPERATION	n	%
Internal fixation DHS	647	18%
Internal fixation screws	59	2%
Internal fixation IM nail (long)	387	11%
Internal fixation IM nail (short)	546	15%
Arthroplasty hemi uncemented	462	13%
Arthroplasty hemi cemented	1233	35%
Arthroplasty THR uncemented	55	2%
Arthroplasty THR cemented	79	2%
Other	86	2%
Not documented	0	0%
Total	**3554**	**100%**

APPENDIX 4: FREQUENCY TABLES

See Appendix 1: Dataset V7.0.1 for Question (Q) references

FIGURE 6.5 PERCENTAGE OF PATIENTS WITH CEMENTED AND UNCEMENTED ARTHROPLASTIES (n=1829)

TYPE OF OPERATION	n	%
Cemented	1312	72%
Uncemented	517	28%
Total	**1829**	**100%**

FIGURES 6.5A: PERCENTAGE OF PATIENTS WITH CEMENTED AND UNCEMENTED ARTHROPLASTIES, BY HOSPITAL (n=1829)

	Uncemented		Cemented		Total	
HOSPITAL	n	%	n	%	n	%
Connolly Hospital Blanchardstown	0	0%	131	100%	131	100%
Midland Regional Hospital, Tullamore	101	89%	12	11%	113	100%
University Hospital Limerick	106	69%	47	31%	153	100%
Letterkenny University Hospital	0	0%	69	100%	69	100%
Sligo University Hospital	7	11%	56	89%	63	100%
University Hospital Waterford	22	10%	198	90%	220	100%
Cork University Hospital	<5	1%	213	99%	215	100%
University Hospital Kerry	11	14%	67	86%	78	100%
University Hospital Galway	100	83%	20	17%	120	100%
Mayo University Hospital	14	19%	59	81%	73	100%
St James's Hospital	<5	4%	81	96%	84	100%
Mater Misericordiae University Hospital	<5	2%	61	98%	62	100%
St. Vincent's University Hospital	130	81%	31	19%	161	100%
Our Lady of Lourdes Hospital, Drogheda	6	6%	93	94%	99	100%
Beaumont Hospital	<5	1%	106	99%	107	100%
Tallaght University Hospital	13	16%	68	84%	81	100%
Total	**517**	**28%**	**1312**	**72%**	**1829**	**100%**

FIGURE 6.6: PERCENTAGE OF PATIENTS BY MOBILISATION DAY OF OR DAY AFTER SURGERY, AND MOBILISED BY (n=3554)

MOBILISED AFTER SURGERY	n	%
Yes (by physiotherapist)	2617	74%
Yes (by other)	104	3%
Not mobilised	803	23%
Not known	30	1%
Total	**3554**	**100%**

APPENDIX 4: FREQUENCY TABLES

See Appendix 1: Dataset V7.0.1 for Question (Q) references

FIGURES 6.6A: PERCENTAGE OF PATIENTS WHO WERE MOBILISED BY A PHYSIOTHERAPIST OR WERE MOBILISED BY SOMEONE ELSE ON THE DAY OF OR DAY AFTER SURGERY, BY HOSPITAL (n=3524)

HOSPITAL	Mobilised by physiotherapist		Mobilised by someone else		Not mobilised		Total
	n	%	n	%	n	%	
Connolly Hospital	193	91%	5	2%	14	7%	212
Midland Regional Hospital, Tullamore	122	57%	8	4%	83	39%	213
University Hospital Limerick	278	93%	0	0%	20	7%	298
Letterkenny University Hospital	125	92%	0	0%	11	8%	136
Sligo University Hospital	78	68%	35	30%	2	2%	115
University Hospital Waterford	249	60%	23	6%	142	34%	414
Cork University Hospital	254	59%	<5	0%	172	40%	428
University Hospital Kerry	102	76%	<5	3%	28	21%	134
Galway University Hospital	198	92%	0	0%	17	8%	215
Mayo University Hospital	121	90%	0	0%	13	10%	134
St. James's Hospital, Dublin	133	85%	0	0%	24	15%	157
Mater Misericordiae University Hospital	147	96%	<5	3%	2	1%	153
St. Vincent's University Hospital	197	58%	7	2%	134	40%	338
Our Lady of Lourdes Hospital, Drogheda	183	92%	<5	1%	14	7%	198
Beaumont Hospital	114	60%	13	7%	63	33%	190
Tallaght University Hospital	123	65%	<5	1%	64	34%	189
Total	**2617**	**74%**	**104**	**3%**	**803**	**23%**	**3524**

FIGURES 6.6B: PERCENTAGE OF PATIENTS WHO WERE ASSESSED BY A PHYSIOTHERAPIST ON THE DAY OF OR DAY AFTER SURGERY, BY HOSPITAL (n=3554)

HOSPITAL	Assessed by physiotherapist	
	n	%
Mater Misericordiae University Hospital	154	99%
University Hospital Limerick	292	98%
Letterkenny University Hospital	135	99%
Galway University Hospital	210	97%
Our Lady of Lourdes Hospital, Drogheda	196	98%
Connolly Hospital	209	98%
Mayo University Hospital	128	96%
St. James's Hospital, Dublin	155	98%
University Hospital Kerry	122	86%
Sligo University Hospital	79	69%
Tallaght University Hospital	179	94%
University Hospital Waterford	264	63%
Cork University Hospital	292	68%
St. Vincent's University Hospital	211	62%
Beaumont Hospital	146	74%
Midland Regional Hospital, Tullamore	147	69%
Total	**2919**	**82%**

APPENDIX 4: FREQUENCY TABLES

See Appendix 1: Dataset V7.0.1 for Question (Q) references

FIGURE 7.1: PERCENTAGE OF PATIENTS BY FUNCTIONAL OUTCOMES: CAS (n=1677)

	Day of surgery		Day of discharge	
CAS	n	%	n	%
0	275	16%	115	7%
1	108	6%	43	3%
2	187	11%	91	5%
3	1031	61%	804	48%
4	42	3%	141	8%
5	15	1%	179	11%
6	19	1%	304	18%
Total	**1677**	**100%**	**1677**	**100%**

FIGURE 7.2: PERCENTAGE OF PATIENTS BY DESTINATION ON DISCHARGE (N=3751)

DISCHARGED TO	n	%
Home	735	20%
On-site rehab unit	90	2%
Off-site rehab unit	1078	29%
Convalescence care	557	15%
New admission to nursing home or long-stay care	214	6%
Return admission to nursing home or long-stay care	501	13%
Died	184	5%
Other	306	8%
Not known	86	2%
Total	**3751**	**100%**

FIGURE 7.4: PERCENTAGE OF PATIENTS BY RE-OPERATION WITHIN 30 DAYS (n=3554)

RE-OPERATION WITHIN 30 DAYS	n	%
No	3052	86%
Yes	47	1%
Not Known	455	13%
Total	**3554**	**100%**

APPENDIX 5: ADDITIONAL INFORMATION

See Appendix 1: Dataset for question references.

TYPE OF TRAUMA	N	%
High-energy falls	96	3%
Low-energy falls	3,536	94%
Not known	119	3%
Total	**3,751**	**100%**
PATHOLOGICAL	**N**	**%**
Atypical	12	0%
Malignancy	68	2%
No	3,315	88%
Not known	356	9%
Total	**3,751**	**100%**
PREVIOUS FRAGILITY FRACTURE	**N**	**%**
Yes	1,056	28%
No	2,344	62%
Not known	351	9%
Total	**3,751**	**100%**
GERIATRICIAN GRADE [a]	**N**	**%**
Consultant	1,761	68%
Specialist Registrar (SpR)	482	19%
Registrar	296	11%
Other	14	1%
Not known	36	1%
Total	**2,589**	**100%**
SURGEON GRADE [b]	**N**	**%**
Consultant	1,940	55%
Specialist Registrar (SpR)	965	27%
Registrar	608	17%
Senior House Officer (SHO)	26	1%
Not known	15	0%
Total	**3,554**	**100%**
ANAESTHETIST GRADE [b]	**N**	**%**
Consultant	3,122	88%
Specialist Registrar (SpR)	97	3%
Registrar	157	4%
Senior House Officer (SHO)	103	3%
Not known	75	2%
Total	**3,554**	**100%**
MULTIDISCIPLINARY REHABILITATION TEAM ASSESSMENT [c]	**N**	**%**
Yes	3,326	93%
No	225	6%
Not known	16	0%
Total	**3,567**	**100%**

(a) Only includes patients assessed by a geriatrician during their acute admission.
(b) Only includes patients who received surgery during their acute admission.
(c) Excludes patients who died in hospital.

APPENDIX 6: SPECIFICATIONS FOR COMPOSITE VARIABLES

See Appendix 1: Dataset for question references.

FIGURE 4.2: ADMISSION TO ORTHOPAEDIC WARD OR THEATRE WITHIN FOUR HOURS FROM ED

4.2.1. 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
Patient admitted direct to theatre within 4 hours	If Q5=1 and time to surgery is calculated as within 4 hours
Never Admitted to Orthopaedic Ward	If Q5=2
Not Known	If Q5=9 or blank

*If patients go to theatre direct from ED and within four hours of first presentation they are included

4.2.2. 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.

4.2.3. 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)

APPENDIX 6: SPECIFICATIONS FOR COMPOSITE VARIABLES

See Appendix 1: Dataset for question references.

FIGURE 4.3: TIME TO SURGERY- 48 HOURS/WORKING HOURS

4.3.1. 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

4.3.2. 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.

4.3.3. 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)

APPENDIX 6: SPECIFICATIONS FOR COMPOSITE VARIABLES

See Appendix 1: Dataset for question references.

FIGURE 4.5: ASSESSMENT BY A 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 6.1: 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 6.6A: 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

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