

IRISH HIP FRACTURE DATABASE

NATIONAL REPORT 2019

Stay safe and active at home



REPORT PREPARED BY:

Dr Emer Ahern,
Irish Hip Fracture Database Clinical Geriatric Lead,
Consultant Orthogeriatrician, Cork University Hospital

Louise Brent,
Irish Hip Fracture Database and Major Trauma Audit Manager,
National Office of Clinical Audit

Michelle Fitzgerald MSCP,
Health and Social Care Professional (HSCP) Representative
Physiotherapy Manager, Peamount Healthcare

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

Dr Fionnola Kelly,
Head of Data Analytics & Research,
National Office of Clinical Audit

Carlo Lodola,
Senior Data Analyst,
National Office of Clinical Audit

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

Aoife Moroney Ward,
Communications and Events Lead,
National Office of Clinical Audit

WITH ASSISTANCE FROM THE IRISH HIP FRACTURE DATABASE GOVERNANCE COMMITTEE:

Prof. Tara Coughlan, Consultant Physician in Geriatric and Stroke Medicine, Tallaght University Hospital

Brian Donovan, Head of Pricing, Healthcare Pricing Office

Catherine Farrell, Programme Manager, Clinical Programme for Trauma and Orthopaedic Surgery, Royal College of Surgeons in Ireland (RCSI)

Dr Patrick Higgins, Consultant Anaesthetist, College of Anaesthesiologists of Ireland

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

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

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

Lucy Nugent, Chief Executive Officer, Tallaght University Hospital

Dr Teresa O'Callaghan, National Quality Improvement Advisor, National Quality Improvement Team, Health Service Executive (HSE)

Dr Mary Walsh, Postdoctoral Fellow and Honorary Lecturer, RCSI Department of General Practice

Dr Helena Ferris, Specialist in Public Health Medicine, Department of Public Health, HSE South

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Clinical audit is a clinically-led quality improvement process that seeks to improve patient care and outcomes through systematic review of care against explicit criteria, and acting to improve care when standards are not met (DOHC, 2008).

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For more information about this report, contact

National Office of Clinical Audit, 2nd Floor, Ardilaun House, Block B, 111 St Stephen's Green, Dublin 2, D02 VN51

Tel: +353 (1) 402 8577
Email: ihfd@nocai.ie

DESIGNED BY
SWERVE

Irish Hip Fracture Database

National Report 2019

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

30th September, 2020

Dear Dr Ahern/Mr Hurson,

I wish to acknowledge receipt of the Irish Hip Fracture Database National Report 2019.

Following review of this report that included external peer reviewers and NOCA, I am delighted to endorse this report on behalf of the NOCA Governance Board.

I wish to congratulate you both, Ms Louise Brent and all those involved in the continued efforts in developing and progressing this valuable quality improvement initiative. The IHFD audit continues to serve as an exemplar for quality improvement for all NOCA audits.

Please accept this as formal endorsement from the NOCA Governance Board of the Irish Hip Fracture Database National Report 2019

Yours sincerely,



Dr Brian Creedon
Clinical Director
National Office of Clinical Audit

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

FOREWORD

It gives me great pleasure to write the foreword for the *Irish Hip Fracture Database National Report 2019*. The Irish Hip Fracture Database (IHFD) is an exemplary audit which shows the impact of continuous measurement, taking action on the data, and closing the audit loop.



By setting data quality as one of the audited goals for the Best Practice Tariff, the IHFD has ensured an almost complete dataset. The other measurable goals have clearly had a positive impact on the outcomes of patients who have sustained hip fractures. The success of the IHFD can be seen in the way that the Irish Hip Fracture Standards have become common knowledge in hospitals where hip fracture patients are treated and are at the forefront of everyone's minds. As more hip fracture standards are met, the outcomes for patients will continue to improve.

Hip fracture care is an excellent surrogate for many aspects of trauma care in general. Patients must be brought to the right place at the right time. They must have timely and appropriate treatment. They must be managed by a multidisciplinary team, including surgical, medical, nursing, and allied health professionals working together. The emphasis of all aspects of care is on facilitating the patient's rehabilitation and return to their pre-injury levels of activity. Alongside a desire to prevent injuries in the first place, this brilliantly summarises the aims of the overall trauma care system.

In many locations across Ireland, patients with hip fractures bypass hospitals that cannot provide the surgical aspects of their management. One of this report's recommendations is that this process be further developed. This is in keeping with the trauma care system's aim to have appropriate bypass protocols in place for all trauma cases, including hip fractures.

Another recommendation of this report is that priority pathways be put in place for hip fractures. The IHFD has recognised the importance of timely initial and surgical care. In accordance with the national trauma strategy, priority pathways need to be extended from early falls risk assessment and comprehensive orthogeriatric assessment and care through to rehabilitation in the community and closer to home.

Once again, the IHFD shows how meaningful change can be achieved through audit, with positive long-term effects on outcomes in a vulnerable population. I look forward to working with the IHFD team in NOCA and those responsible for caring for hip fracture and other trauma patients.

Mr Keith Synnott

National Clinical Lead for Trauma Services

ACRONYMS / ABBREVIATIONS

TABLE 1.0: ACRONYMS / ABBREVIATIONS

ACRONYM	FULL TERM
4AT	rapid clinical test for delirium
AAGBI	Association of Anaesthetists of Great Britain and Ireland
AFFINITY	National Falls and Bone Health Project (2018–2023)
AMT	Abbreviated Mental Test
ANP	advanced nurse practitioner
ANZHFR	Australian & New Zealand Hip Fracture Registry
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
DFB	Dublin Fire Brigade
DHS	dynamic hip screw
DVR	data validation report
DXA	dual-energy X-ray absorptiometry
ED	emergency department
FFN	Fragility Fracture Network
FLS	Fracture Liaison Service
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
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
IM	intramedullary

ACRONYM	FULL TERM
KPI	key performance indicator
LOS	length of stay
MDT	Multi Disciplinary Team
MTC	Major Trauma Centre
NAS	National Ambulance Service
NHFD	National Hip Fracture Database (UK)
NICE	National Institute for Health and Care Excellence
NMS	New Mobility Score
NOCA	National Office of Clinical Audit
OLOL	Our Lady of Lourdes
PPI	Public and Patient Interest
PUTZ	Pressure Ulcer to Zero
QIT	Quality Improvement Team
RCSI	Royal College of Surgeons in Ireland
SA	spinal anaesthetic
SHFA	Scottish Hip Fracture Audit
SHO	Senior House Officer
SpR	Specialist Registrar
SPSS	Statistical Package for the Social Sciences
THR	total hip replacement
TU	trauma unit
UK	United Kingdom

EXECUTIVE SUMMARY

This is the seventh national report from the Irish Hip Fracture Database (IHFD). To date, the audit has captured data on more than 21,000 cases. *The Irish Hip Fracture Database National Report 2019* includes data on 3,701 cases. Our data provide detailed insight into the care, pathways, and outcomes of patients and allow each hospital to benchmark itself against comparable hospitals in Ireland and internationally. The audit has maintained a strong focus on the Irish Hip Fracture Standards (IHFS) detailed in Figure 1, and this report shows further improvement in hospitals' compliance with those standards, as well as in many other areas of care. Data coverage has exceeded 99% again this year, with all 16 eligible hospitals continuing to upload data to the IHFD regularly.

Each hospital, through the formation of a hip fracture governance committee (HFGC), is encouraged to use the quarterly and national reports for continuous quality improvement. Without the constant leadership provided by our hospital clinical leads and the dedication and hard work of our audit coordinators, this audit would not be possible. The National Office of Clinical Audit (NOCA) Executive Team and the IHFD Governance Committee wish to thank the clinical leads, audit coordinators, and hospitals for their continued commitment to and engagement with this audit.

IRISH HIP FRACTURE STANDARDS (IHFS)

The Irish Hip Fracture Database measures key clinical steps in the care of hip fracture patients.

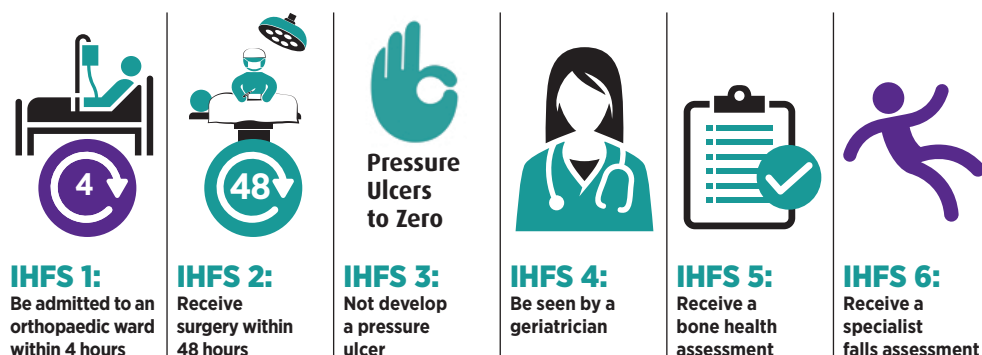


FIGURE 1: IRISH HIP FRACTURE STANDARDS

***Data coverage has exceeded 99% again this year,
with all 16 eligible hospitals continuing to upload data
to the IHFD regularly.***



KEY FINDINGS

KEY FINDINGS

- In 2019, 95% of patients with a hip fracture were admitted to an orthopaedic ward, compared with 91% in 2018.
- Twenty-five percent of patients were admitted to an orthopaedic ward or operating theatre from the emergency department (ED) within 4 hours, compared with only 17% of patients in 2018.
- In 2019, 76% of surgeries were conducted within 48 hours and within normal working hours. This has improved by four percentage points since 2018, and the median time to surgery has reduced by 1 hour, to 26 hours.
- A geriatrician reviewed 82% of patients at some point during their acute stay in 2019. This represents a considerable improvement over 2018, when only 69% of patients were reviewed by a geriatrician during their stay.
- In 2019, a bone health assessment was carried out on 94% of patients, compared with 84% in 2018. Fourteen of the participating hospitals achieved at least 90% compliance with this standard in 2019. There was also a greater percentage of patients being discharged on definitive bone health treatment in 2019 (71%) versus 2018 (62%).
- Prior to discharge, 83% of patients had a specialist falls assessment in 2019, compared with only 70% in 2018.
- There continues to be variability in the level of compliance in the IHFS at hospital level.
- The total money paid out as a result of the Best Practice Tariff (BPT) in 2019 was €548,000, with 15% of all hip fracture patients nationally meeting all eight BPT standards. This represents an improvement of eight percentage points from 2018.
- Our Lady of Lourdes Hospital Drogheda had the highest proportion of patients' care meeting the BPT, with almost one in three patients achieving this standard.
- Of the 3,701 hip fracture cases recorded in 2019, 69% were female (n=2550).
- Home continues to be the place from which patients are most likely to be admitted to hospital (85%, n=3146).
- More than half (53%, n=1799) of hip fracture patients were assigned an American Society of Anesthesiologists (ASA) grade of 3, indicating severe systemic disease.

KEY FINDINGS

→	The most common types of fractures recorded in 2019 were intracapsular displaced fractures (41%, n=1519) and intertrochanteric fractures (36%, n=1319).
→	Ninety-three percent (n=3435) of patients presented directly to an ED in an operating hospital.
→	Sixty percent of patients received a nerve block pre-operatively. The use of nerve blocks ranged from 10% to 95% at hospital level.
→	Fifty percent of patients had no documented nutritional risk assessment in their records.
→	Seventy-six percent of arthroplasties reported in 2019 were cemented (n=1399), which was a slight increase over 2018. However, there is a large variation in the use of bone cement at hospital level.
→	Eighty-two percent (n=2889) of patients were mobilised on the day of or day after surgery, and 87% were assessed by a physiotherapist on the day of or day after surgery. Both variables have increased by five percentage points from 2018.
→	Twenty-three percent (n=453) of patients for whom Cumulative Ambulatory Score data were recorded achieved a maximum CAS of 6 indicating independent mobility, on discharge from the acute hospital. This represents an improvement of five percentage points from 2018.
→	Twenty-four percent (n=885) of patients were discharged directly home from hospital, an increase of four percentage points from 2018; a further 31% (n=1162) required further rehabilitation either at an on-site or off-site facility.
→	Four percent (n=158) of patients were admitted to long-term care as a new admission, a reduction of two percentage points from 2018.
→	The mean length of stay (LOS) for hip fracture patients was 19.5 days, which is a slight increase from the 18.7 days reported in 2018. The median LOS remained constant at 12 days, which is the same as that reported in 2018.
→	Twenty-five percent of patients were discharged from the acute hospital within 1 week.

KEY RECOMMENDATIONS

RECOMMENDATIONS FOR NOCA

- Introduce a new IHFS for early mobilisation – measuring the percentage of patients mobilised by a physiotherapist on the day of or the day after surgery – to quarterly reports in 2020.
- Develop workshops to create a learning culture for quality improvement with the clinical leads and audit coordinators of the IHFD.
- Support hospitals to attain high levels of data coverage and quality until at least 2022, as they recover from COVID-19.
- Implement processes for the introduction of long-term outcome measures in the IHFD.
- Develop a research group for the IHFD, including Public and Patient Interest (PPI) representatives.
- Conduct an organisational audit to look at resources, governance and quality improvement at hospital level in 2020.
- Increase engagement with PPI representatives to:
 - Raise awareness on topics such as falls prevention and frailty
 - create information resources for patients about what to expect while in hospital, on discharge, and for rehabilitation
 - create opportunities for multistakeholder engagement around key issues faced by patients.

RECOMMENDATIONS FOR THE HEALTH SERVICE EXECUTIVE

- The National Office for Trauma Services, Health Service Executive (HSE) in collaboration with the Clinical Programme for Trauma and Orthopaedic Surgery, will:
 - continue to prioritise and operationalise a national hip fracture bypass for all hospitals
 - improve pathways of care for hip fracture through the trauma system, i.e. ED, operating theatre and rehabilitation.

RECOMMENDATIONS FOR HOSPITAL MANAGERS, CLINICIANS AND AUDIT COORDINATORS

- HFGCs should follow NOCA's guidance for governance committees and meet quarterly to discuss and prioritise IHFD areas for attention.
- Focus on increasing compliance with the IHFS to attain the BPT.
- Develop and resource a multidisciplinary orthogeriatric services.
- Comply with the new IHFS for early mobilisation, which will measure the percentage of patients mobilised by a physiotherapist on the day of or the day after surgery.
- Prioritise the discharge of patients directly home from hospital where possible.

CAPTURING PATIENT PERSPECTIVES

I have been a member of the IHFD Governance Committee as the PPI Representative since 2017. 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 seek to highlight aspects of patients' experiences which could get lost when the focus is primarily on the clinical outcomes. The role of PPI Representative allows me to explore options for creating opportunities to disseminate information related to hip fractures to the public, and for capturing patient experiences for inclusion in the audit.



I have learned that a hip fracture patient's episode of care does not necessarily start from the time a hospital number is attached to it, and it most certainly does not end once the patient is discharged from hospital. Issues such as falls prevention, protocols for check-up after a fall, understanding the importance of attending the right hospital in time, the benefits of early mobilisation, and how the care systems should work together to support each patient's recovery and discharge to the patient's preferred location are all important and should be part of the discourse in providing care to hip fracture patients. The immediate response to the hip injury is bound to have an impact on the patient's treatment and recovery process. Equally, adequate follow-up and support following discharge from hospital has a bearing in building up the patient's strength and confidence, speeding up the recovery, and perhaps even enabling their return to independent living for as long as possible.

Patients with hip fracture should be supported as much as possible to understand their clinical condition while in hospital and to get involved in decisions about their care. The process of raising awareness must go beyond their hospital stay by encouraging each patient and their carers to play an active role in the patient's care and get involved in addressing issues such as bone health, falls and fracture prevention, treatment/surgery options, rehabilitation, follow-up care, and home activity and safety.

The focus of this report is 'Stay safe and active at home', concerning the wider public and (potential and current) hip fracture patients. Data provided from the Major Trauma Audit National Report 2018, published in early 2020, summarised the causes of falls experienced by people in their own homes, which also apply to hip fracture patients; this IHFD report will continue to align itself with the home safety messages outlined in the Major Trauma Audit report. The section in this IHFD report entitled 'What is a hip fracture?', complemented by additional details and infographics, would be of particular relevance for hip fracture patients and the wider public. These constitute relevant information materials which should be disseminated on a wider scale to inform the public about how to keep safe at home and prevent harmful falls, and what to expect while in hospital if they do suffer an injury from falling.

It is good to see that improvements in care have also continued in 2019 across all IHFS. This shows that the audit is making an impact for patients and that hospitals are striving to meet the best standard of care for their patients. It is expected that consideration will be given to areas requiring improvement within each hospital, and that supports will be put in place to achieve high standards of quality improvement in the care of hip fracture patients. However, the public, as well as health and social care professionals outside the hospital setting, also have an important, active role to play in getting informed in order to achieve the best possible outcomes.

The next section of this report explains what a hip fracture is and informs the public and patients about issues such as hip fracture causes, populations at risk of hip fracture, and potential types of treatment, with a view to empowering patients to play an active role in their own care.

Bibiana Savin,
Sage Advocacy

UNDERSTANDING HIP FRACTURE FROM THE PATIENT'S PERSPECTIVE

The following information aims to inform patients and the public about what a hip fracture is, describe the anatomy of the hip, and explain who is likely to sustain a hip fracture and how this can happen. The image of the house in Figure 3 aims to highlight advice about how to keep safe at home in order to prevent harmful falls that could lead to a hip fracture.

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 2). It is also 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. Several factors influence this increased risk of fracture as people age.

- Falls are the leading cause of hip fractures.
- Slowing reflexes may lead to an increased risk of falling, as people cannot protect themselves quickly enough to break the fall, often resulting in the hip taking 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) (Bandeem-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 a ball and socket joint (Figure 2). 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 as intertrochanteric or subtrochanteric fractures, depending on their location.
- The type of operation performed in order to fix the fracture will depend on the location of the fracture.

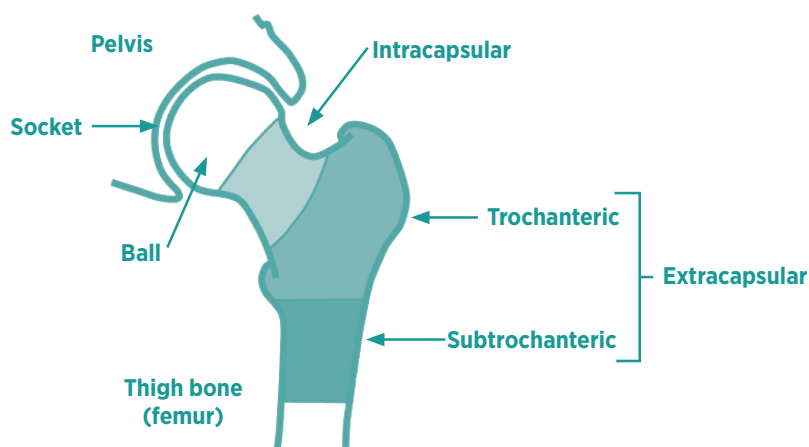


FIGURE 2: ANATOMY OF THE HIP

ABOUT HOME SAFETY

Falls most commonly occur in the home, and many things can be done to prevent these falls and make the home a much safer environment. Taking notice of some of the information highlighted in Figure 3 can help to prevent falls resulting in hip fracture and other harmful injuries.

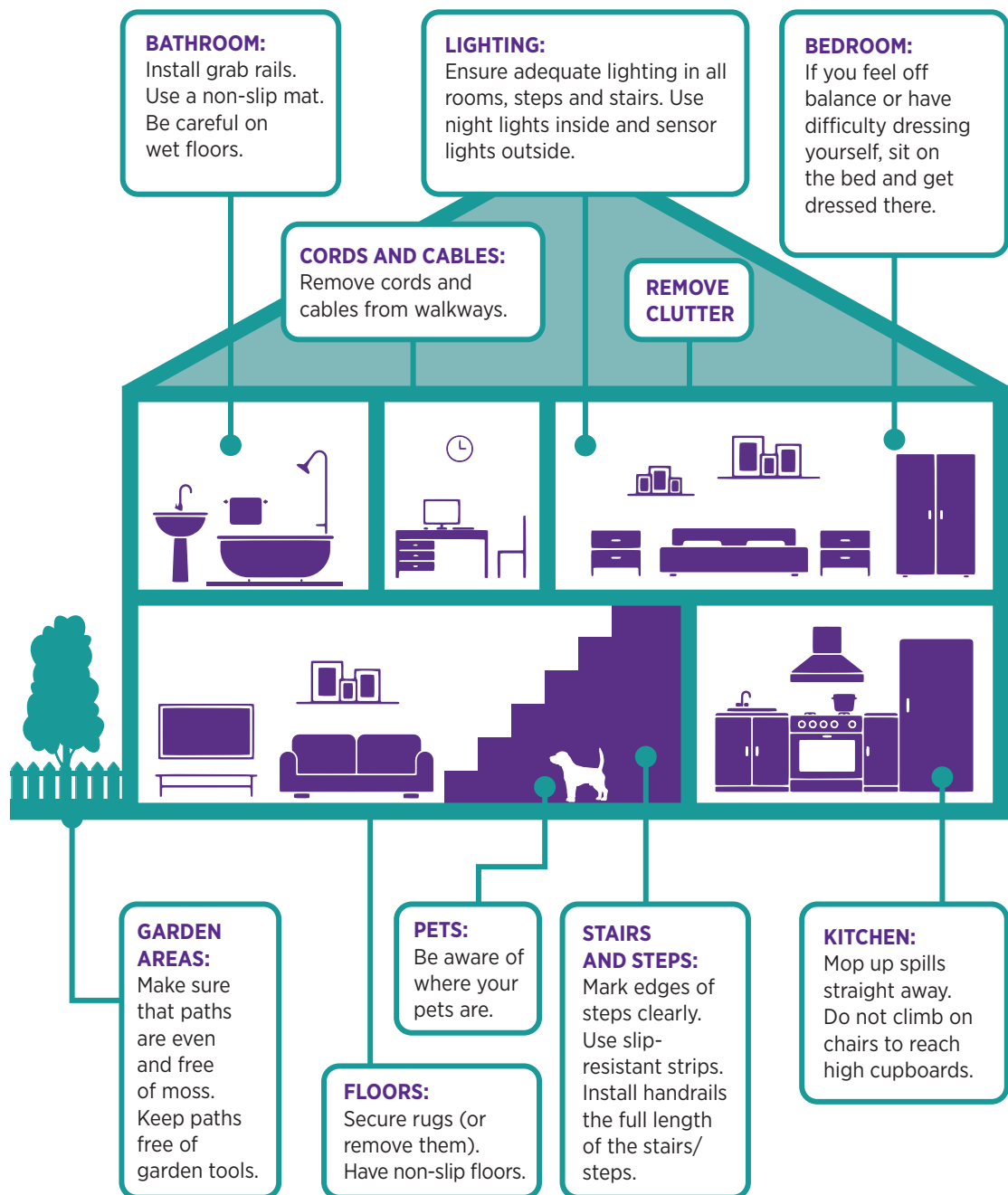
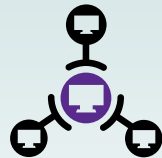


FIGURE 3: HOME SAFETY ADVICE

KEY HIGHLIGHTS 2019



99%

Data coverage of 99%



Pressure
Ulcers
to Zero

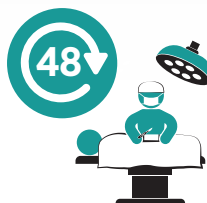
3%

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



25%

IHFS 1: 25% of patients admitted to an orthopaedic ward/ theatre within four hours



76%

IHFS 2: 76% of patients received surgery within 48 hours



82%

IHFS 4: 82% of patients seen by a geriatrician



83%

IHFS 6: 83% of patients received a specialist falls assessment



12

Median length of stay: 12 days



24%

24% of patients were discharged directly home from the acute hospital



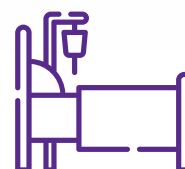
94%

IHFS 5: 94% of patients received a bone health assessment



82%

82% of patients mobilised on the day of or the day after surgery

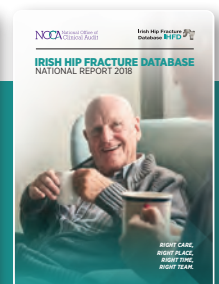
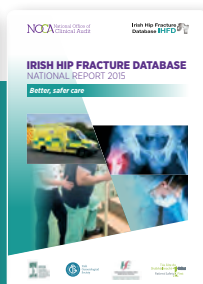
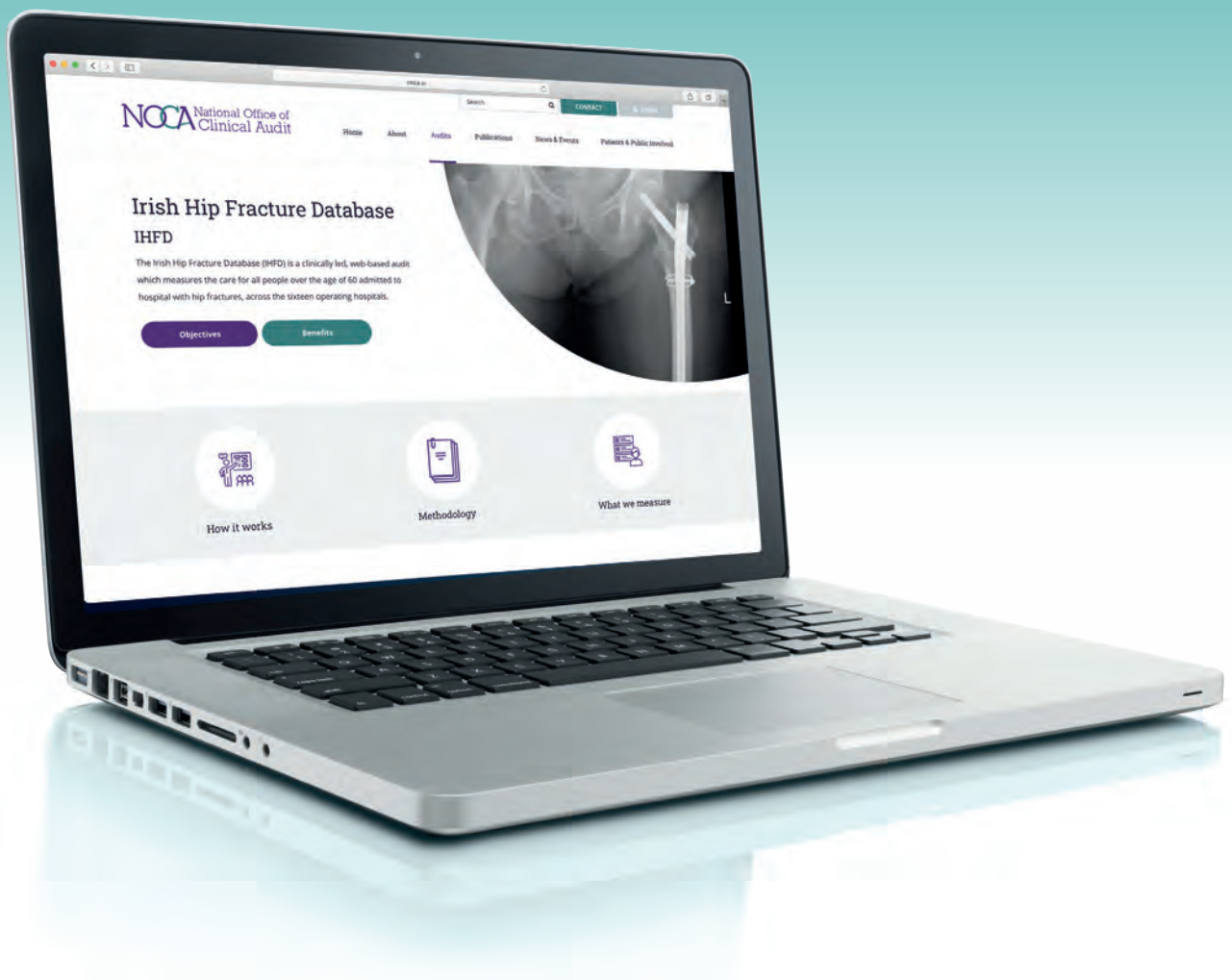


72,314

72,314 acute bed days for hip fracture patients

CHAPTER 1

INTRODUCTION



CHAPTER 1: INTRODUCTION

Hip fractures continue to be one of the most serious and costly injuries suffered by older people globally. In Ireland, it is estimated that their acute hospital management alone costs €45 million annually (Healthcare Pricing Office, 2018). As life expectancy continues to improve, the number of hip fractures will increase (Kelly *et al.*, 2018), so the need for adequate acute hospital care resources, rehabilitation services and community resources will also increase. The Irish Hip Fracture Database (IHFD) is a clinically led, web-based audit that measures hip fracture care and secondary fracture prevention. The overarching aim of the audit is to use data to improve the care provided to people who sustain a hip fracture.

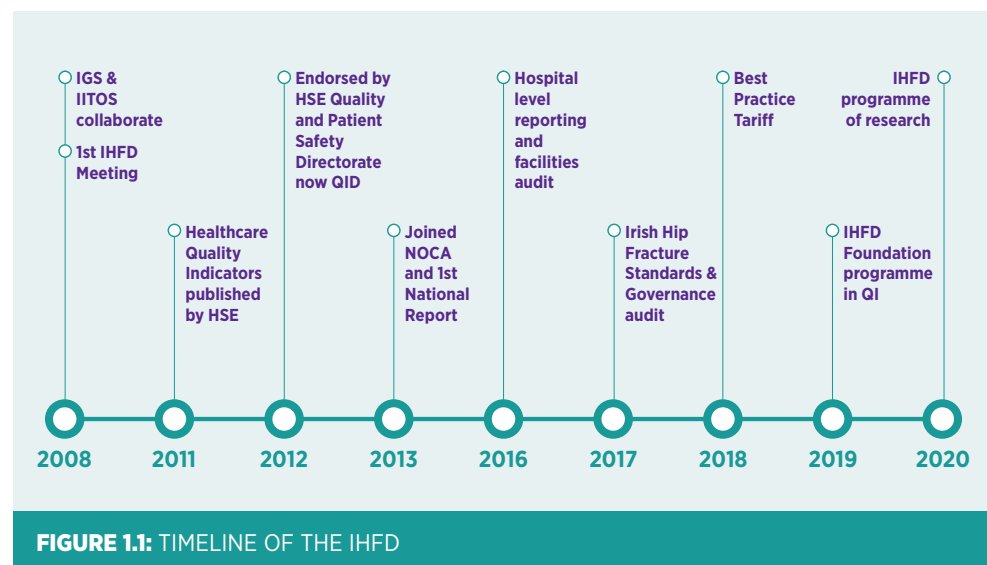
Ireland's trauma system is undergoing a transformation following the publication of *A Trauma System for Ireland: Report of the Trauma Steering Group* (Department of Health, 2018), which has recommended the establishment of an inclusive trauma system that focuses on patient-centred care. Two trauma networks will be established, with a Major Trauma Centre (MTC) in each network and a number of trauma units (TUs) linked to each MTC. What this means for hip fracture patients is that they will be brought to a designated TU that will have the resources and the capacity to provide prompt assessment, surgery, orthogeriatric and multidisciplinary care, and rehabilitation.

Several recommendations were made in *A Trauma System for Ireland: Report of the Trauma Steering Group* (Department of Health, 2018), related to the importance of clinical audit and the processes of developing the new trauma system. The IHFD has already contributed several years' worth of data to assist the National Office for Trauma Services, Health Service Executive (HSE) in its decision-making process and evaluation of what and how changes are to be made to the national trauma care system. Several recommendations in the report also echoed many of the IHFD recommendations; for example, the need for orthogeriatric services, fracture prevention, falls prevention, and enhanced rehabilitation services, as well as high-quality data. Therefore, the IHFD is appropriately positioned to monitor the impact on the care and outcomes of patients following changes to the trauma system.

Internationally, clinical audits focusing on hip fracture care continue to deliver demonstrable improvements in care outcomes, most importantly in the reduction in mortality (Neuburger *et al.*, 2015). The IHFD has been collaborating with many other established hip fracture registers to enhance learning and bring synergy to the standards of care measured across all audits (López *et al.*, 2019; Johansen *et al.*, 2017). A landmark publication by the Fragility Fracture Network (FFN) has consolidated that alignment with a globally endorsed set of key recommendations for the care of patients with fragility fractures. These are:

- 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).

This is the seventh national IHFD report; since the commencement of the audit in 2012, the IHFD has gathered data on more than 21,000 hip fracture patients in Ireland. The maturity of the IHFD has led to many health system changes, such as orthogeriatric service development, transparent reporting, incentives for achieving best practice standards, and investing in a programme for quality improvement (Figure 1.1).



In 2019, the IHFD made many strides forward, with continued improvement in all Irish Hip Fracture Standards (IHFS) and data quality, as well as achieving higher Best Practice Tariff (BPT) payments compared with 2018. An IHFD research group will be established to build on the research that is already starting to come from the data. Ferris *et al.* (2020) identified predictors of in-hospital mortality in an Irish hip fracture population (2013–2017) and highlighted that early mobilisation reduces the incidence of inpatient mortality; consequently, this has supported the recommendation for a new IHFS to measure the percentage of patients mobilised on the day of or the day after surgery. A two-day Foundation Programme for Quality Improvement, facilitated by the National Office of Clinical Audit (NOCA) and delivered by the HSE National Quality Improvement Team, was developed and delivered towards the end of 2019 and has led to a renewed momentum and commitment from the clinical leads, clinicians, and healthcare staff involved in the audit to use the data for continuous quality improvement.

There is still some way to go in order to further improve on the strides already made; for example, getting more patients functionally independent and sent directly home from hospital will be a key area of focus for the IHFD in the future, as will sharing messages and advice about how to keep active and safe at home in order to prevent hip fractures in the first place. It is hoped that this report will inform and encourage all healthcare staff involved in the care of hip fracture patients to 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 2019* presents our key findings on the IHFS, BPT, case mix, patient pathway, and outcomes.
2. The *Irish Hip Fracture Database National Report 2019: Summary Report* will be of particular interest to patients, patient organisations and the public.
3. A local hospital report for 2019 comparing each individual hospital with the *Irish Hip Fracture Database National Report 2019* has been issued to the individual hospitals in advance of the publication of the national report.

AIM AND OBJECTIVES

The focus of the audit is to collect high-quality data and use these data to improve the quality of care for hip fracture patients.

AIM

To 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 (HIQA), 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 outputs 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 the provision of high-quality data for research.

OBJECTIVE 7

Collect longer-term outcome data (e.g. quality of life and survival).

OBJECTIVE 8

Support the BPT (a tariff-based payment structure for hip fracture) and act as the primary data source for hip fracture key performance indicators (KPIs).

OBJECTIVE 9

Capture the patient voice/experience and disseminate audit findings to patients and the public in an accessible manner.



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. The inclusion and exclusion criteria for this report are detailed below.

INCLUSION CRITERIA

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

- (i) discharged between 1 January 2019 and 31 December 2019, inclusive (the HIPE data file used was 2019_V17, extracted on 15 May 2020); this extraction time was later than anticipated due to disruption caused by the COVID-19 pandemic and the additional workload on hospital coding departments.
- (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 and over.

EXCLUSION CRITERIA

- (i) aged 59 years or under.
- (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 COLLECTION

The data are collected in the local hospitals by audit coordinators who enter the data retrospectively from patient medical records. Each hospital has an audit coordinator and a clinical lead and should have a hip fracture governance committee (HFGC). A list of cases eligible for inclusion is identified by running a HIPE Discharge Report in the IHFD Portal. The data are entered through the HIPE IHFD Portal and linked with a hospital admission episode. The audit coordinator and clinical lead can generate local reports. The 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. Most data are entered retrospectively and in accordance with the data collection targets (Table 2.1).



TABLE 2.1: DATA COLLECTION CALENDAR 2019

Data collection period	Data collection target	Data reporting date
01/01/2019–31/03/2019	30/06/2019	11/07/2019
01/04/2019–30/06/2019	30/09/2019	18/10/2019
01/07/2019–30/09/2019	31/12/2019	30/01/2020
01/10/2019–31/12/2019	30/04/2020*	18/05/2020

*The target date was extended by 4 weeks due to the COVID-19 pandemic.



DATA ANALYSIS

The data extract was received by NOCA on 15 May 2020. This was later than anticipated due to the COVID-19 pandemic. In 2019, data validation reports (DVRs) were developed by the IHFD Audit Manager and NOCA data analytics team. This process was helped by several hospitals agreeing to pilot and test the DVRs until they were suitable to be sent to all sites. A guidance document was developed by NOCA to support the hospital audit coordinators to complete this new process. The DVRs were then sent to hospitals on two occasions to validate the full data for the year 2019. In future, quarterly DVRs will be sent to the hospitals.

Analysis for the national report was completed by the NOCA data analytics team following data checks with the HPO. The analysis was conducted using Statistical Package for the Social Sciences (SPSS) V25.

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: Ann Marie Mullen

IHFD CLINICAL LEAD: Mr William Gaine

MAYO UNIVERSITY HOSPITAL

IHFD AUDIT COORDINATOR: Suzanne O'Donnell

IHFD CLINICAL LEAD: Mr Derek Bennett

UNIVERSITY HOSPITAL GALWAY

IHFD AUDIT COORDINATOR: Aoife Dempsey

IHFD CLINICAL LEAD: Mr Colin Murphy

UNIVERSITY HOSPITAL LIMERICK

IHFD AUDIT COORDINATOR: Pamela Hickey

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

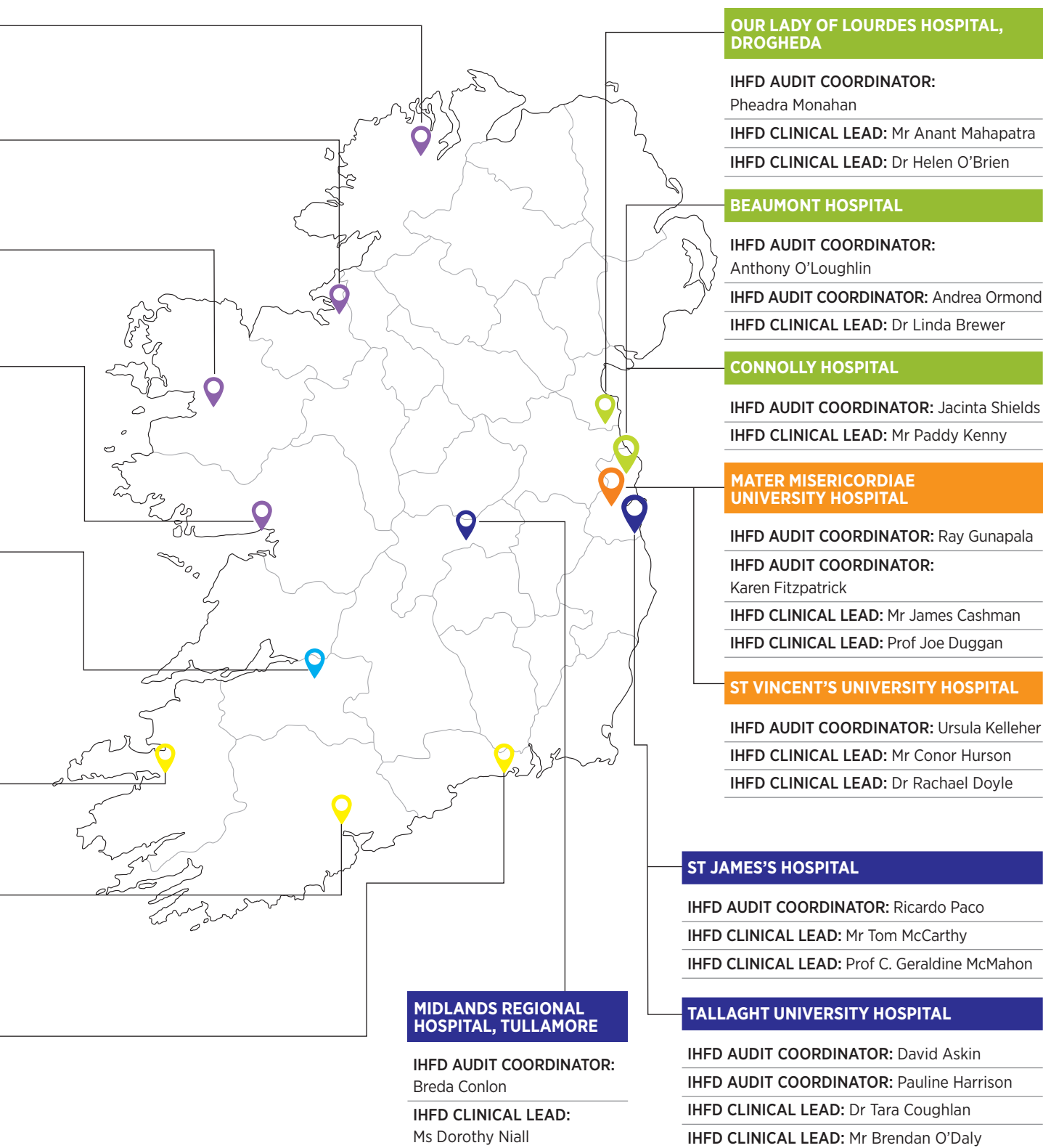
IHFD CLINICAL LEAD: Dr Emer Ahern

UNIVERSITY HOSPITAL WATERFORD

IHFD AUDIT COORDINATOR: Lorraine Smith

IHFD AUDIT COORDINATOR: Gavin Egan

IHFD CLINICAL LEAD: Mr Terence Murphy



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 2019 data using internationally agreed dimensions of data quality as laid out in the *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. reducing the use of the 'not known' variable following the introduction of DVRs during 2019, and establishing new variables, including nutritional assessment and the use of pre-operative nerve blocks. 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 2019

Dimensions of data quality	Definition (HIQA, 2018)	Assessment of dimension (IHFD)
RELEVANCE 	Relevant data meet the current and potential future needs of users.	<p>The IHFD updates the dataset annually to ensure that all data fields are relevant to the audit. Monthly teleconferences and the annual IHFD workshop with the audit coordinators enable any new data fields to be discussed and piloted. Dataset changes discussed at the final IHFD Governance Committee meeting on 30 September 2019 were implemented from 1 January 2020 for the new reporting year (2020).</p> <p>In 2019, the IHFD introduced the data field to capture the input from candidate advanced nurse practitioners (cANPs) and advanced nurse practitioners (ANPs). As a new IHFS is being introduced in 2020 for the percentage of patients who are mobilised on the day of or the day after surgery, a data field for the reason why patients were not mobilised on the day of or the day after surgery was introduced.</p> <p>All data fields are reported on in the national report and local hospital annual reports. At hospital level, additional fields that may be relevant to that specific hospital can be added for local use only.</p> <p>In 2019, no research requests were received. A publication following the research request granted in 2018 to evaluate what patient or care characteristics influenced inpatient mortality was published in March 2020 in the journal <i>European Geriatric Medicine</i>. This paper, entitled 'Early mobilisation reduces the risk of in-hospital mortality following hip fracture', (Ferris <i>et al.</i>, 2020) submitted by Professor Tara Coughlan, Dr Helena Ferris and Louise Brent, has helped to inform the decision to include a new IHFS for early mobilisation; this area of early mobilisation will be monitored and recorded from 1 January 2020 onwards in the IHFD. The quarterly reports for 2020 will include the addition of the new IHFS for early mobilisation, and these reports will continue to be improved based on feedback from participating hospitals.</p> <p>During 2019, the Trauma Review Implementation Group submitted a data access request for service evaluation to assist with the development of the Central Trauma Network. This request was granted by the IHFD Governance Committee.</p> <p>The IHFD data are now submitted quarterly to the HSE Business Intelligence Unit (BIU) in order to determine KPIs; and the data are also submitted to the HSE National Quality Improvement Team (QIT) in order to determine IHFS 2 quality improvements.</p> <p>Feedback on the relevance of the data is sought through interactions with other organisations such as the HPO, the HSE BIU, the HSE National Office for Trauma Services, and researchers.</p> <p>Ensuring that the IHFD dataset is fit for purpose and is applicable to the relevant audiences is an iterative process involving all the steps highlighted above.</p>

Dimensions of data quality	Definition (HIQA, 2018)	Assessment of dimension (IHFD)
ACCURACY AND RELIABILITY 	<p>The accuracy of data refers to how closely the data correctly describe what they were designed to measure.</p> <p>Reliability refers to whether those data consistently measure, over time, the reality of the metrics that they were designed to represent.</p>	<p>The IHFD collects data on hip fracture patients (aged 18 years and over) through a portal on the HIPE system in collaboration with the HPO. The reference population for the national report focuses only on patients aged 60 years and over.</p> <p>The coverage for the reference population has been reported at hospital level since 2016 in the national report, and quarterly to the hospitals and Hospital Groups. The expected standard is a minimum of 90% coverage. In 2019, all hospitals achieved above the 90% coverage target. The overall national data coverage for the <i>Irish Hip Fracture Database National Report 2019</i> is 99%. Nine hospitals achieved 100% coverage (Figure 3.1).</p> <p>The BPT standard for 90% data coverage quarterly continued to ensure that high levels of data entry were achieved overall.</p> <p>In 2019, a new process for data validation was implemented. This is described in more detail later in this chapter. The process has already reduced 'not known' being recorded for several variables.</p>
TIMELINESS AND PUNCTUALITY 	<p>Timely data are collected within a reasonable agreed time period after the activity that they measure.</p> <p>Punctuality refers to whether data are delivered on the dates promised, advertised, or announced.</p>	<p>NOCA issues data collection targets for each hospital to collect a minimum of 90% data per reporting quarter; a data collection calendar is used to assist this process. The submission timeliness per quarter (i.e. the number of eligible cases on HIPE with IHFD data added) for 2019 was as follows: Quarter 1: 96%, Quarter 2: 97%, Quarter 3: 98%, and Quarter 4: 99%. The cumulative total at the end of the reporting period was 99%.</p> <p>These data are processed and reported (released) to hospitals quarterly within 2–3 weeks, and one quarter in arrears. The IHFD reporting calendar is provided in Chapter 2, Table 2.1.</p> <p>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.</p> <p>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 2019 was revised to 30 April 2020, which is 4 weeks later than normal. This was due to disruption caused by the COVID-19 pandemic and the additional workload on hospital coding departments.</p> <p>The NOCA monitoring and escalation policy details the process of escalation. In 2019, 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.</p>

Dimensions of data quality	Definition (HIQA, 2018)	Assessment of dimension (IHFD)
COHERENCE AND COMPARABILITY 	Coherent and comparable data are consistent over time and across providers and can be easily combined with other sources.	<p>The IHFD dataset follows the patient pathway from the point of first presentation to discharge. The focus of the dataset is on data quality and clinical governance, as well as on six key clinical hip fracture care standards (which in 2020 will become seven standards). Data are collected using national and international classifications, e.g. the International Classification of Diseases, Tenth Revision (ICD 10) and American Society of Anesthesiologists (ASA) classifications.</p> <p>The data definitions and metadata information are included in Appendix 1 and 5.</p> <p>The IHFS are evidence-based clinical standards of care adopted from the international literature and are comparable with many international hip fracture registers (Johansen <i>et al.</i>, 2017). In this report, nutritional status and pre-operative nerve block use are being reported for the first time. These variables, as well as early mobilisation, are also being measured in many of the other international hip fracture audits, such as the United Kingdom's (UK's) National Hip Fracture Database (NHFD), the Scottish Hip Fracture Audit (SHFA) and the Australian & New Zealand Hip Fracture Registry (ANZHFRC).</p> <p>In 2019, the data from the IHFD were used in several publications to compare and benchmark the data against other national hip fracture registers (Shelton and White, 2020; López, 2019).</p> <p>In 2019, data extracts for IHFS 2 were sent quarterly to the HSE BIU for comparison with the national KPI for hip fractures. In addition, these data were shared with the HSE QIT. In 2019, IHFD data became the primary source of data for the KPI.</p>
ACCESSIBILITY AND CLARITY 	Data are easily obtainable and clearly presented in a way that can be understood.	<p>The local HIPE IHFD Portal has inbuilt definitions for each data field at the point of data entry. There are a number of inbuilt reports that can be run by the clinical leads and audit coordinators. All data can be exported locally into Excel for further analysis. During 2019, the quarterly hospital reports were enhanced by the NOCA data analytics team using Microsoft Power BI. The quarterly reports are focused on the performance against the IHFS, data quality, and compliance with the BPT. These reports are also available at Hospital Group and national level. The new format of the reports enables hospitals to compare their performance against a national average. Through the improved presentation of data in run charts, hospitals can identify which areas of practice are working well and which merit improvement.</p> <p>Feedback was sought throughout the process of report development in order to ensure that the reports provided clear data that could enhance hospital decision-making for hip fracture care. Hospitals informed the IHFD Audit Manager that these reports had proved very helpful for use at quarterly HFGC meetings, and also for hospital presentations.</p> <p>National data are made 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, statement of purpose, the IHFD handbook, and national and summary reports.</p> <p>Ongoing work is underway to update the IHFD data dictionary in line with HIQA standards.</p>

99% coverage of hip fracture patients in 2019

DATA COVERAGE

The final dataset used for this report includes 3,701 cases from 16 participating hospitals, with the number of cases per hospital ranging from 116 to 437. 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 2019 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%. Individual hospital coverage ranges from 95% to 100%.

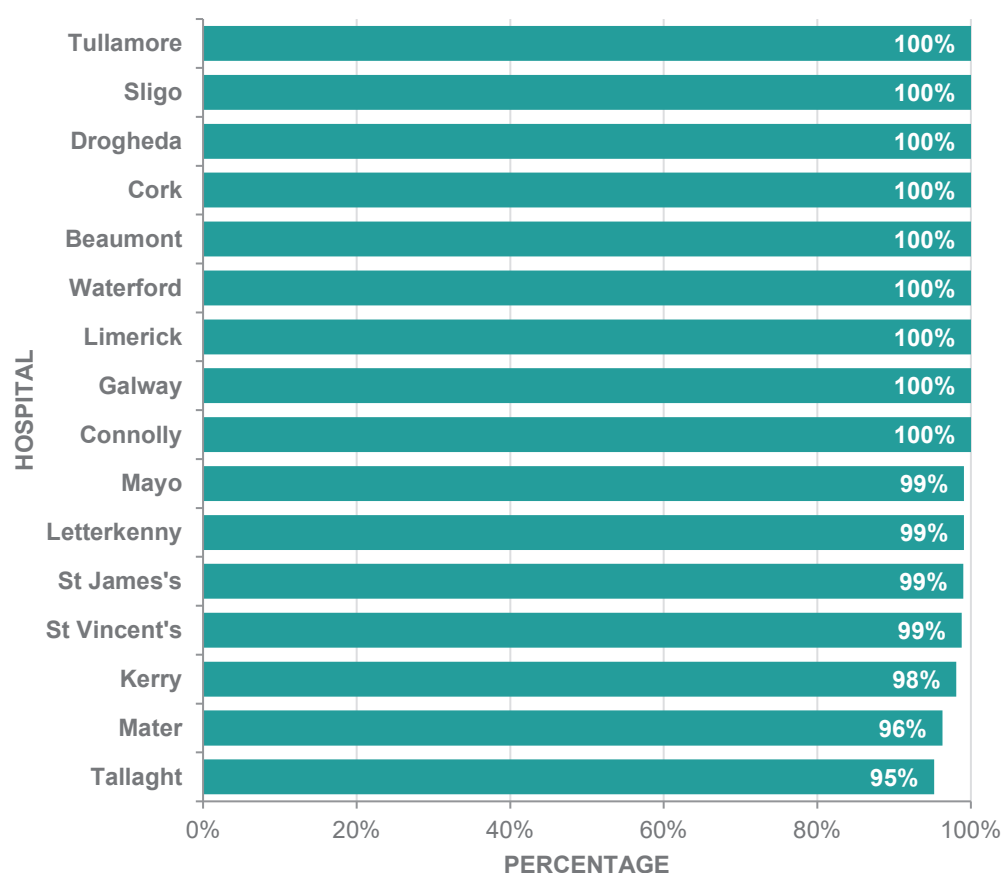


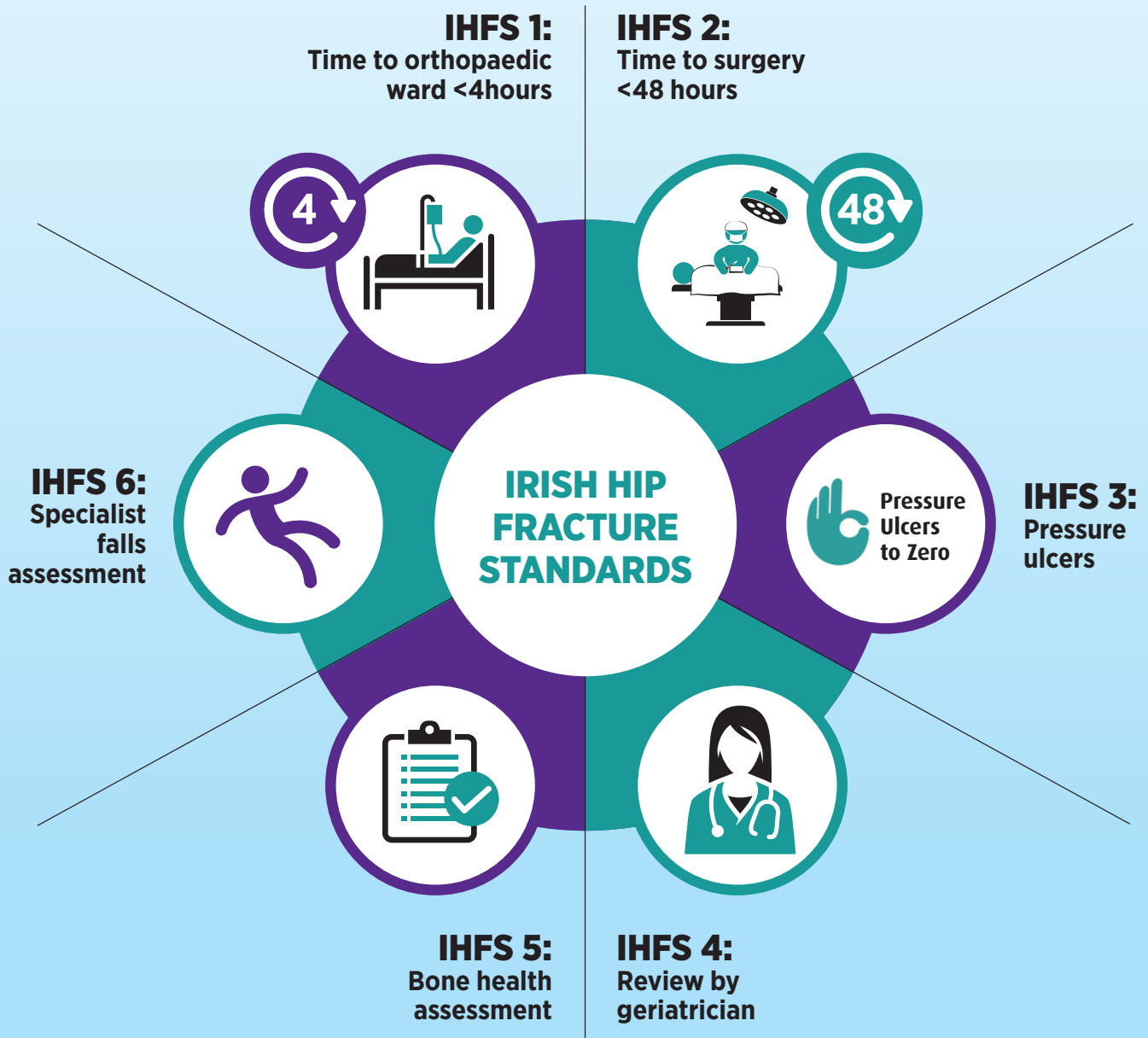
FIGURE 3.1: COVERAGE PERCENTAGES PER HOSPITAL

DATA VALIDATION

In 2019 and early 2020, the NOCA data analytics team developed a robust process for DVRs with the IHFD Audit Manager in order to validate the full dataset. This was to improve upon the limited validation to date. The data extract for the period 1 January 2019 to 30 September 2019 was received in January 2020. The first version of the IHFD DVR, together with an IHFD DVR instruction manual, was issued to the hospital audit coordinators. Learning from the first round of fully validated data enabled improvements to be made in both the database and the DVR. Data for the final quarter of 2019 was validated in April 2020, and data quality issues were corrected. In 2020, the hospitals will receive a DVR each quarter.

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 2018 and 2019. This information is intended to allow hospitals to benchmark their individual performance against their previous performance and against other hospitals' performance. Figure 4.1 shows the national compliance with the IHFS from 2017 to 2019. There is an obvious trend of improvement year on year across all standards, with only IHFS 3 remaining static at 3%.

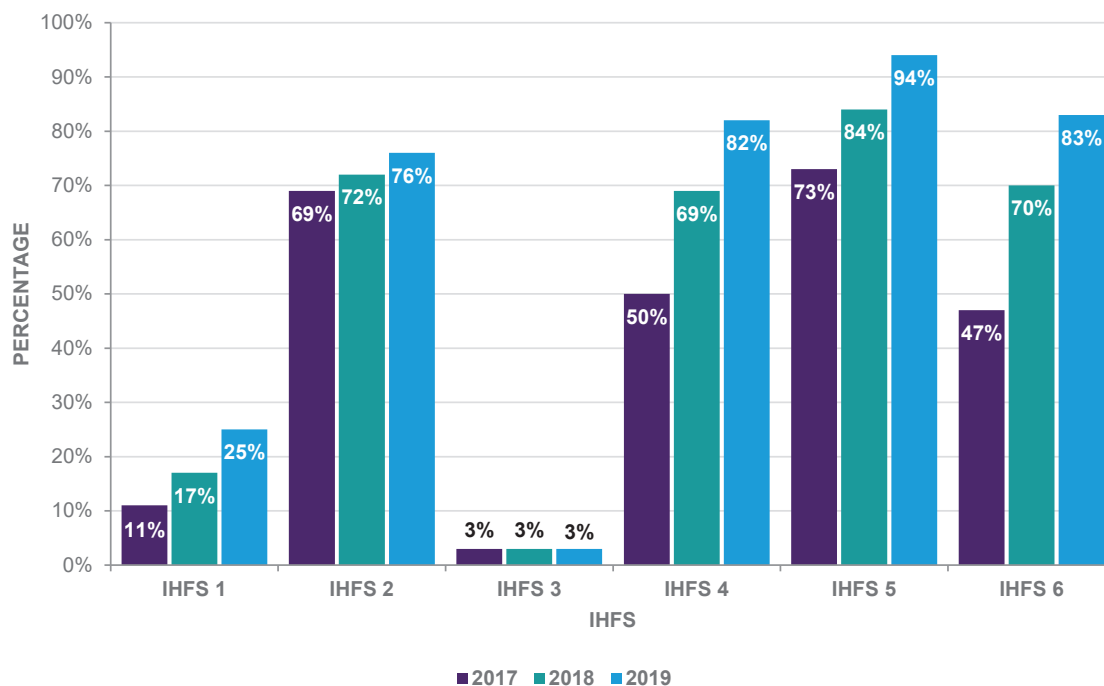


FIGURE 4.1: PERCENTAGE OF PATIENTS NATIONALLY WHO MET EACH IHFS IN 2017 (N=3497), 2018 (N=3751) AND 2019 (N=3701)

IHFS 1

IHFS 1: PERCENTAGE OF PATIENTS ADMITTED TO AN ORTHOPAEDIC WARD WITHIN 4 HOURS OF FIRST PRESENTATION OR ADMITTED TO THEATRE FROM THE EMERGENCY DEPARTMENT WITHIN 4 HOURS



In 2019, 95% (n=3533) of patients were admitted to an orthopaedic ward; this represents an improvement of four percentage points over 2018. However, only 25% (n=923) were admitted to a ward within 4 hours or were admitted to the operating theatre from the emergency department (ED) within 4 hours (Figure 4.2). The median time to admission to an orthopaedic ward in 2019 was 6.6 hours, a slight improvement on 2018. In 2019, the proportion of patients who met this standard at the individual hospital level ranged from 2% to 56%.

Although compliance with this standard continues to be low, this does represent an eight-percentage-point improvement nationally since 2018, when only 17% (n=637) of patients met this standard. Furthermore, 12 hospitals made improvements in 2019. Many of the hospitals are now utilising a pre-alert to the EDs that a suspected hip fracture patient is en route via the National Ambulance Service (NAS) and Dublin Fire Brigade (DFB). In hospitals, key stakeholders are using various methods of communication (e.g. the Siilo app) to alert the team that a hip fracture patient has arrived and enable expedited decision-making. For cases admitted via the ED, the time interval is calculated from time of first arrival at the ED, whether in the first presenting hospital or in the operating hospital.

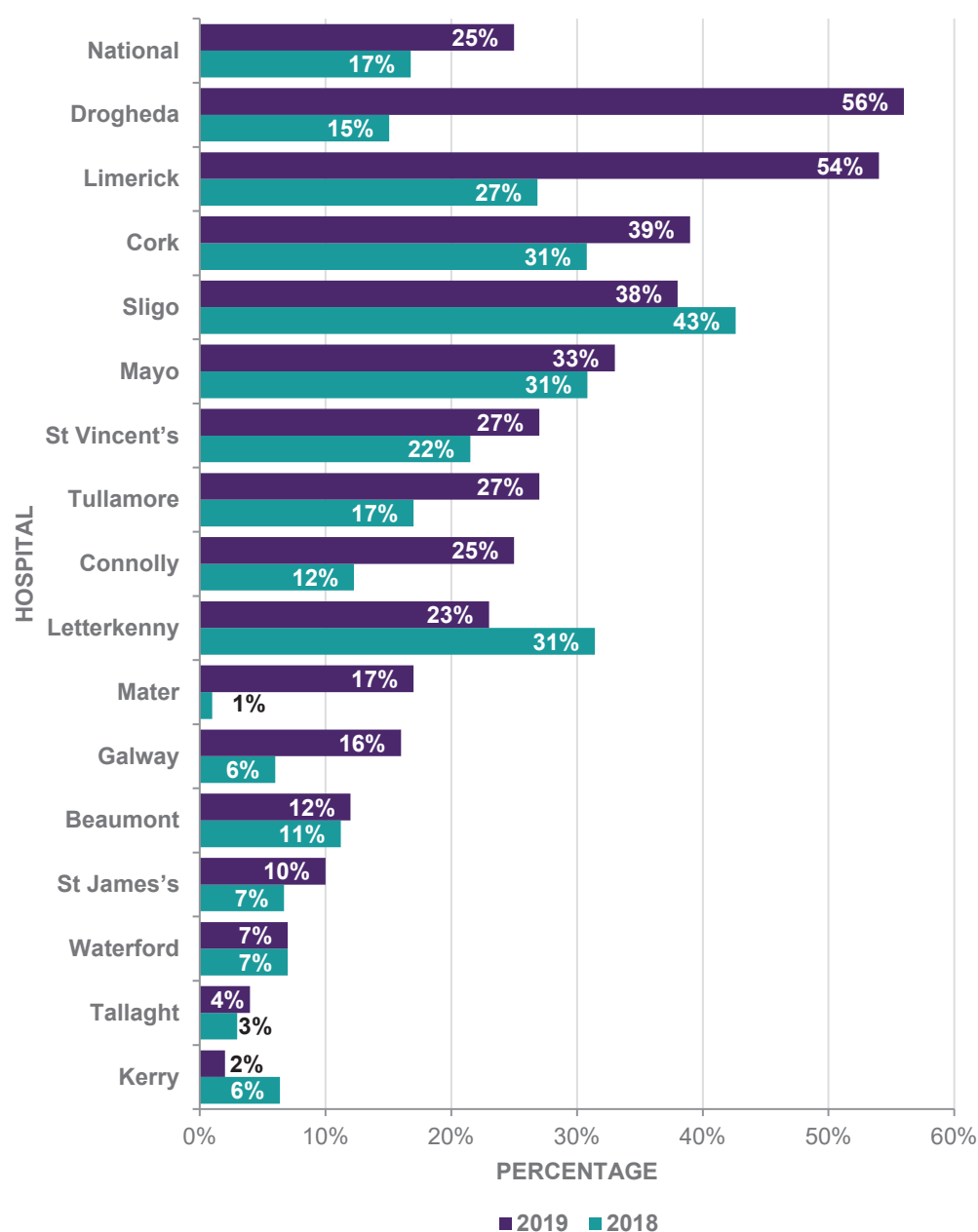
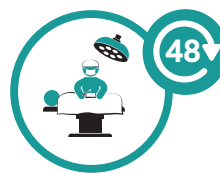


FIGURE 4.2 IHFS 1: PERCENTAGE OF PATIENTS ADMITTED TO AN ORTHOPAEDIC WARD WITHIN 4 HOURS OR ADMITTED TO THEATRE FROM ED WITHIN 4 HOURS, BY INDIVIDUAL HOSPITAL, 2018 (N=3751) AND 2019 (N=3701)

IHFS 2

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



In 2019, surgery was carried out on 96% (n=3536) of patients. Analysis indicates that 76% (n=2672) of those surgeries were conducted within 48 hours and during working hours (Monday to Sunday, 08:00–17:59) (Figure 4.3); this represents an improvement of four percentage points from 2018. The median time to surgery was 26 hours, a reduction of 1 hour from 2018. The proportion of patients who met this standard at the individual hospital level ranged from 60% to 96%. The variance in individual hospital performance remains a concern, as surgery is the single most important intervention for hip fracture care and recovery. There was, however, an increase in the proportion of patients meeting this standard in 12 hospitals between 2018 and 2019.

In 2019, 57% (n=2008) of surgeries were carried out by a consultant orthopaedic surgeon and 26% (n=915) were carried out by a specialist registrar (see Appendix 4).

**76% of surgeries
were conducted
within 48 hours
and within normal
working hours**

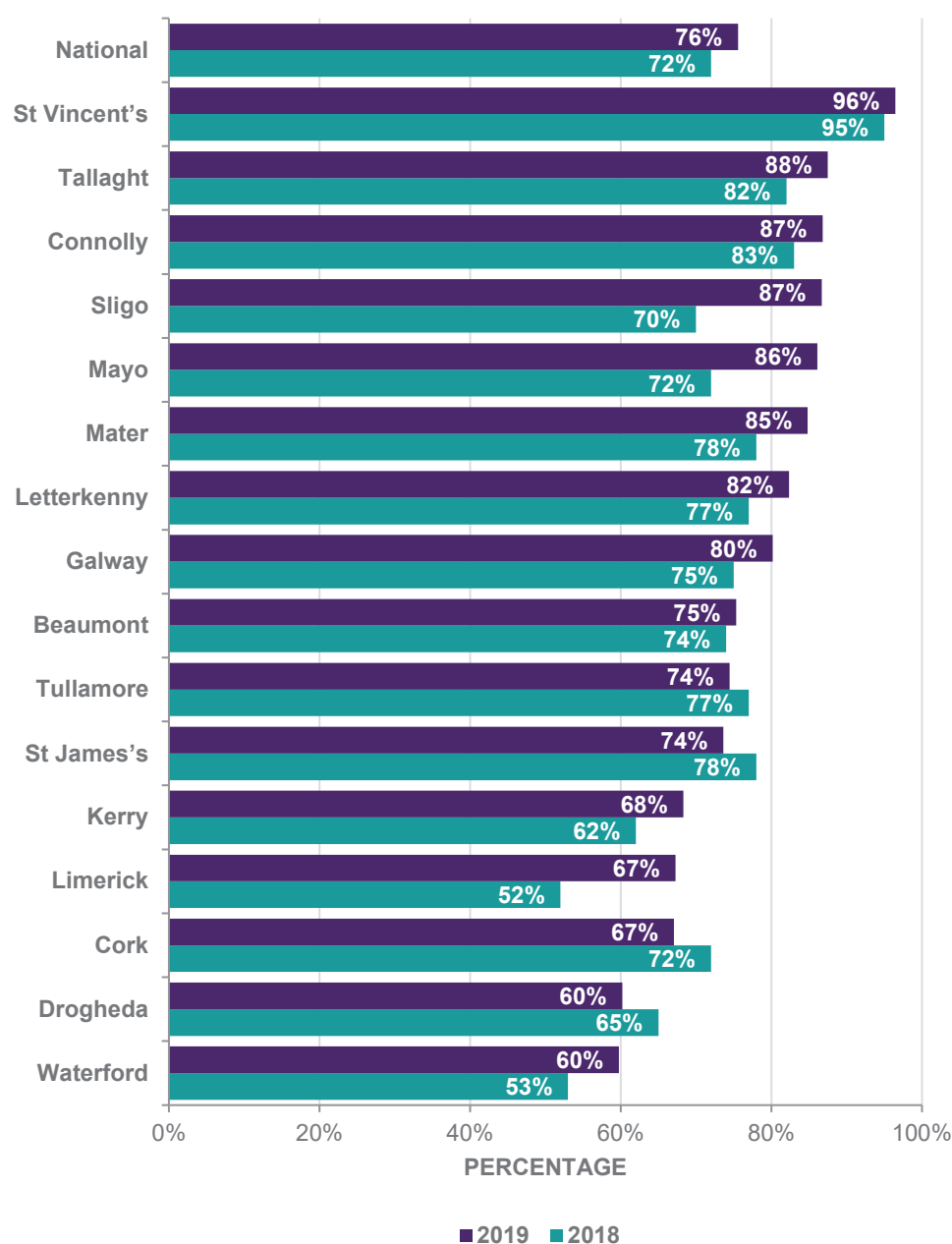


FIGURE 4.3 IHFS 2: PERCENTAGE OF PATIENTS RECEIVING SURGERY WITHIN 48 HOURS (AND WITHIN NORMAL WORKING HOURS), BY INDIVIDUAL HOSPITAL, 2018 (N=3554) AND 2019 (N=3536)¹

¹ 197 patients did not have surgery in 2018 and 165 patients did not have surgery in 2019.

IHFS 3

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



Of those patients who were discharged in 2019, 3% (n=108) 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 13% in 2019. There has been an increase in the proportion of patients developing a pressure ulcer in seven of the 16 participating hospitals since 2018; six hospitals made improvements and three hospitals remained the same in the intervening period. A multidisciplinary approach to pressure ulcer care should be used, including participation in the HSE Pressure Ulcer to Zero (PUTZ) initiative, early and regular assessment of pressure areas, early surgery, 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.

There has been an improvement in pressure ulcer incidence in 6 participating hospitals

The hip fracture governance committee in St James's Hospital were contacted due to the high pressure ulcer incidence for IHFS 3 in 2018 and 2019. Assurance was given to NOCA that the results from IHFS 3 had been a point of concern since 2018, and ongoing work was being undertaken to review this standard. This involved a quality improvement project being developed specifically for IHFS 3. Due to recent improvements in compliance with the BPT, additional resources were acquired to assist with this quality improvement project. This included the purchase of a subepidermal moisture scanner. Improvements were also made in a number of areas in the hip fracture patient pathway, such as reduction in time from ED to the orthopaedic ward, increased availability of pressure-relieving surfaces, Code Hip initiatives, and a daily ward round by the trauma audit coordinator and the tissue viability nurse. All of these interventions have now begun to demonstrate clear reductions in pressure ulcers in St James's Hospital. Data from Q1 2020 have reassured NOCA that appropriate action has and continues to be taken to address compliance with this standard.

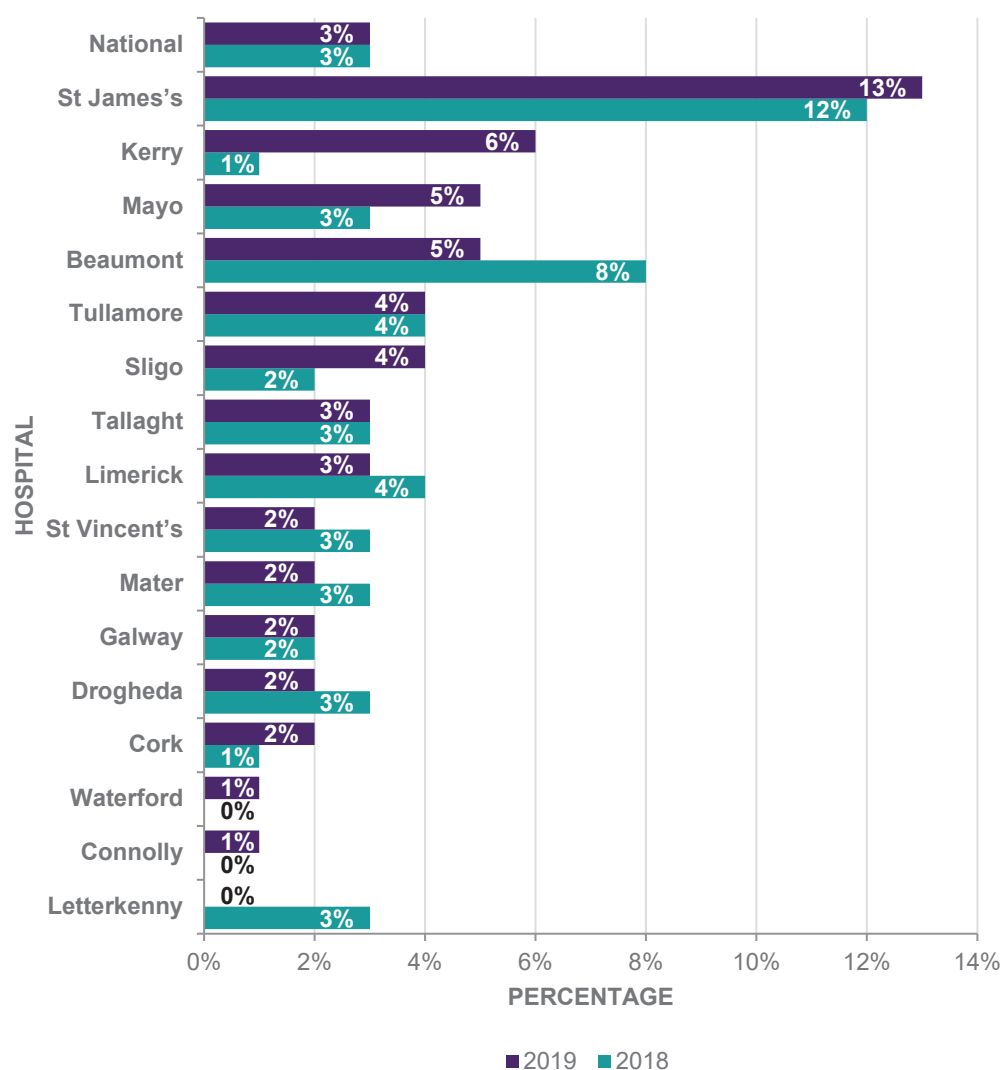


FIGURE 4.4 IHFS 3: PERCENTAGE OF PATIENTS WHO DEVELOPED PRESSURE ULCERS FOLLOWING ADMISSION, BY INDIVIDUAL HOSPITAL, 2018 (N=3567) AND 2019 (N=3498)²

² 184 patients died in 2018 and 203 patients died in 2019. These patients have been excluded from the analysis.

IHFS 4

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



Figure 4.5 shows that, nationally, 82% (n=3029) of patients were reviewed by a geriatrician at some point during their acute stay in 2019. This represents an improvement of 13 percentage points from 2018. In addition, 38% (n=1418) of patients were seen pre-operatively compared with 26% in 2018. Sixty-eight percent (n=2052) of these reviews were carried out by a consultant geriatrician (Appendix 4). 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 three national reports. The IHFD has been recognised as a key driver in the development of orthogeriatrics in Ireland. In 2019, there were orthogeriatric services in 13 of the 16 hospitals participating in the IHFD audit. The configuration of each of these services varies and work is underway to further develop a minimum criterion for an orthogeriatric service definition. The proportion of patients who met IHFS 4 at the individual hospital level in 2019 ranged from 24% to 98%. Although 14 of the 16 hospitals made improvements on their 2018 performance, there is still a large variation in the proportion of patients being seen by a geriatrician at the individual hospital level.

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).

82% of patients were reviewed by a geriatrician during their acute hospital stay

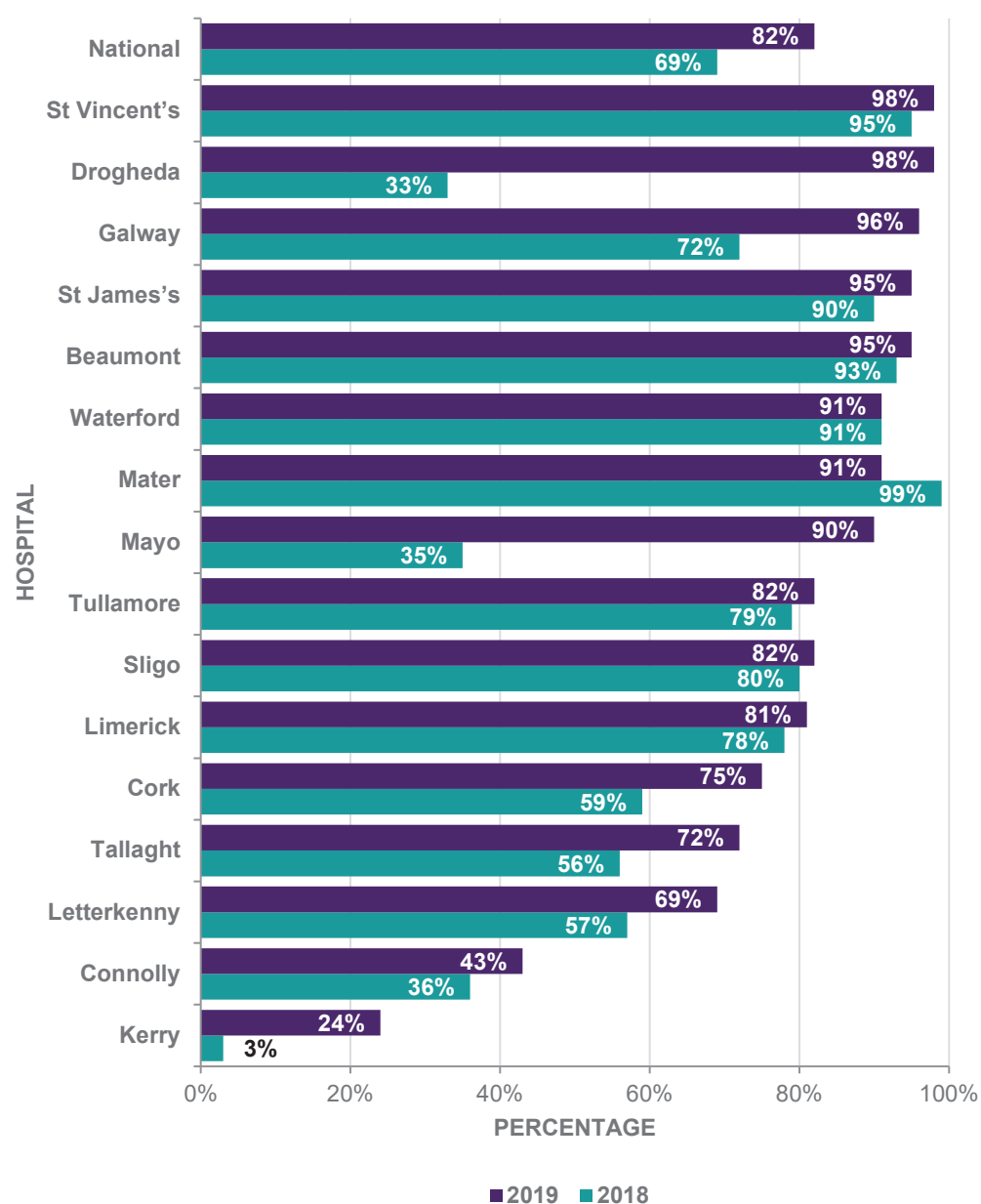


FIGURE 4.5 IHFS 4: PERCENTAGE OF PATIENTS SEEN BY A GERIATRICIAN DURING ADMISSION, BY INDIVIDUAL HOSPITAL, 2018 (N=3751) AND 2019 (N=3701)

IHFS 5

IHFS 5: PERCENTAGE OF PATIENTS RECEIVING A BONE HEALTH ASSESSMENT



In 2019, a bone health assessment was carried out on 94% (n=3289) of patients; this represents an improvement of 10 percentage points from 2018. Furthermore, 71% (n=2478) of patients had their bone health medication commenced or continued from pre-admission, which is a nine-percentage-point improvement from 2018 (Figure 4.6). Twenty-nine percent (n=1089) of patients were recorded as having a previous fragility fracture (Appendix 4). Ninety-five percent (n=3521) of all fractures resulted from low-energy trauma (Appendix 4).

94% of patients had a bone health assessment

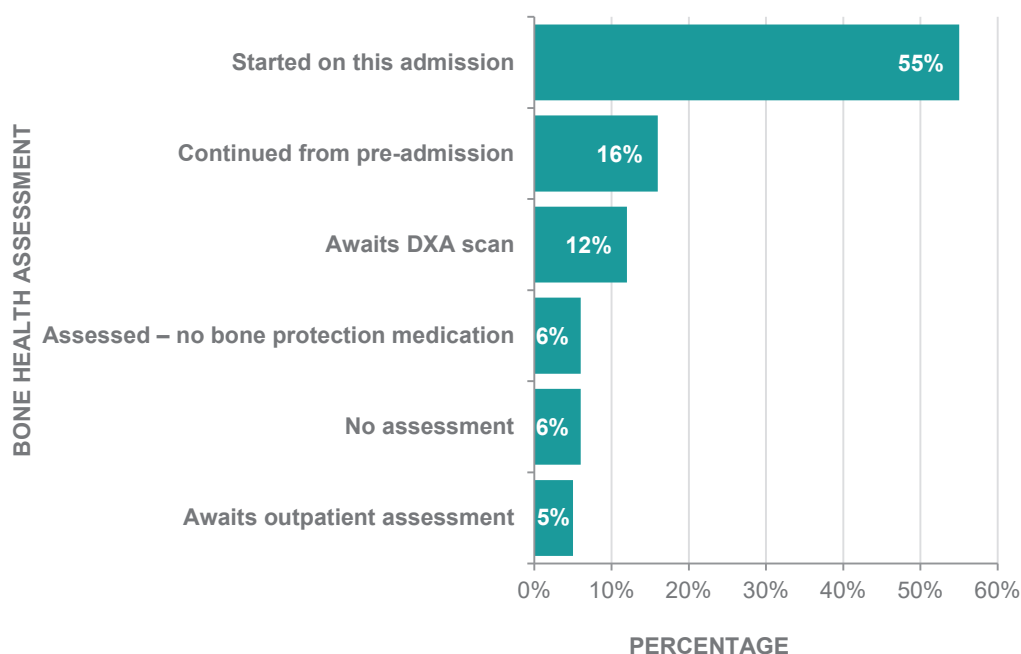


FIGURE 4.6 IHFS 5: PERCENTAGE OF PATIENTS WHO RECEIVED A BONE HEALTH ASSESSMENT IN 2019 (N=3498) ^{3,4}

³ 203 patients died in 2019. These patients have been excluded from the analysis.

⁴ Percentages may not sum to 100% due to rounding.

Figure 4.6A shows that 14 of the participating hospitals achieved at least 90% compliance with this standard in 2019. The proportion of patients who met this standard at the individual hospital level in 2019 ranged from 72% to 100%.

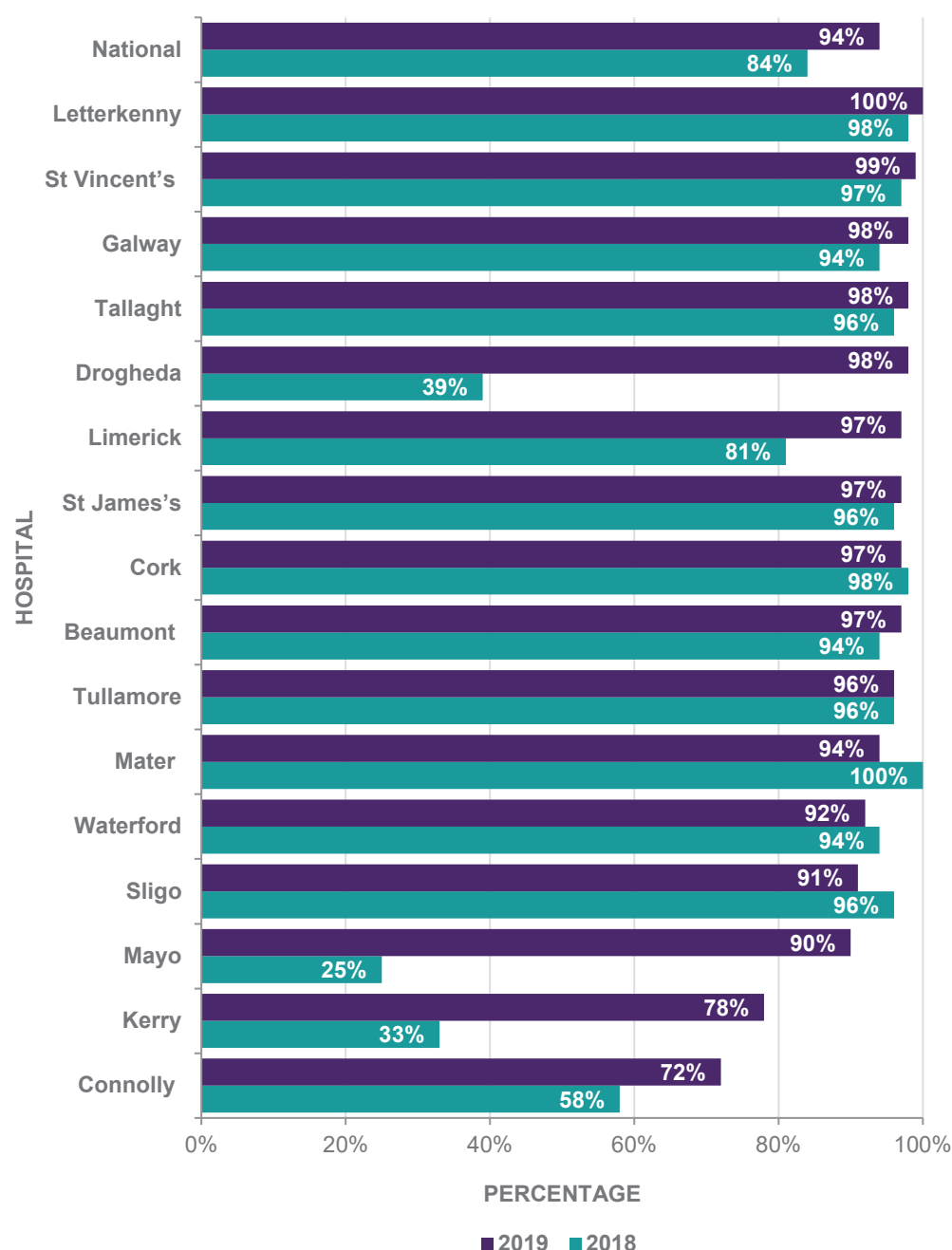


FIGURE 4.6A IHFS 5: PERCENTAGE OF PATIENTS WHO RECEIVED A BONE HEALTH ASSESSMENT, BY INDIVIDUAL HOSPITAL, 2018 (N=3567) AND 2019 (N=3498)⁵

⁵ 184 patients died in 2018 and 203 patients died in 2019. These patients have been excluded from the analysis.

IHFS 6

IHFS 6: PERCENTAGE OF PATIENTS RECEIVING A SPECIALIST FALLS ASSESSMENT



Prior to discharge, 83% (n=2912) of hip fracture patients had a specialist falls assessment during their admission in 2019 (Figure 4.7). This represents a considerable improvement from 2018, when only 70% (n=2483) of patients met this standard. However, there continues to be variability in the level of compliance across the 16 participating hospitals, ranging from 27% to 99% in 2019. This variability can be attributed to the level of orthogeriatric services and falls services provided in the individual hospitals. A specialist 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.

83% of patients had a specialist falls assessment

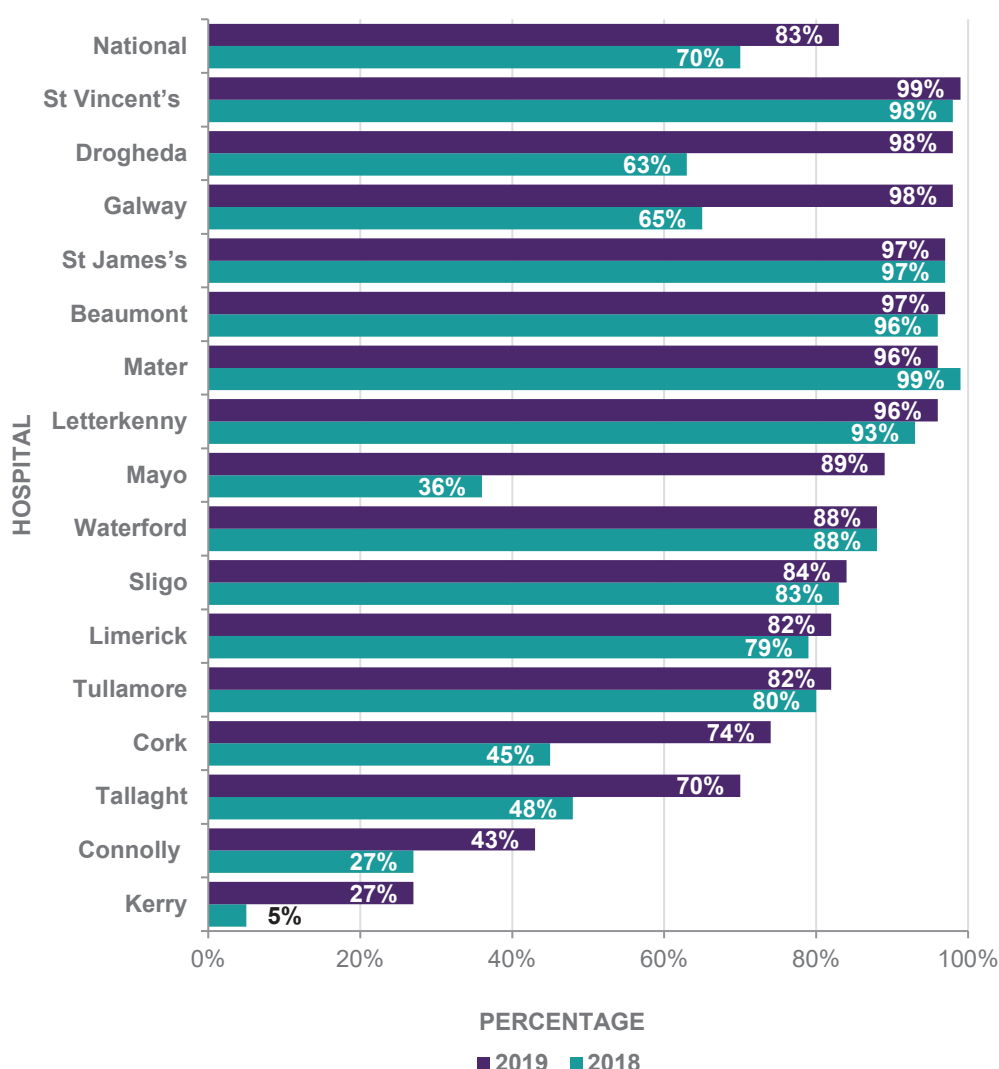


FIGURE 4.7 IHFS 6: PERCENTAGE OF PATIENTS WHO RECEIVED A SPECIALIST FALLS ASSESSMENT, BY INDIVIDUAL HOSPITAL, 2018 (N=3567) AND 2019 (N=3498)⁶

⁶ 184 patients died in 2018 and 203 patients died in 2019. These patients have been excluded from the analysis.

BEST PRACTICE TARIFF


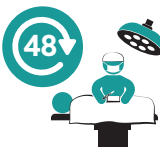






In 2018, the IHFD supported the introduction of the BPT. This process involved collaboration between the HPO, National Clinical Advisor and Group, the HSE, the Clinical Programme for Trauma and Orthopaedic Surgery, and NOCA.

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. The standards consist of the IHFS and two additional standards focusing on data quality and governance. This payment is a performance incentive linked to quality care in the form of the 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 hospital management and 70% to the trauma service. The BPT is reported quarterly to the hospitals, and the clinical lead for the local hip fracture governance committee (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 and may be associated with improved outcomes such as mortality, reduced readmission rates and improved quality of care overall (Metcalf et al., 2019). However, considerations need to be taken into account around unintended consequences of a tariff-based model. During 2020, the IHFD Research Group will evaluate the impact of the BPT and publish these findings.

This report shows that for 2019, due to factors that may or may not be entirely attributable to the BPT, there has been a continued improvement in data quality, with improved data coverage and clinical performance. This level of improvement has been sustained and furthered from 2018.

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 2019, all eligible hospitals met this standard, and the level of coverage for the audit remained exceptionally high at 99%. Figure 4.8 shows the steady improvement in coverage year on year since national reporting began for the IHFD.

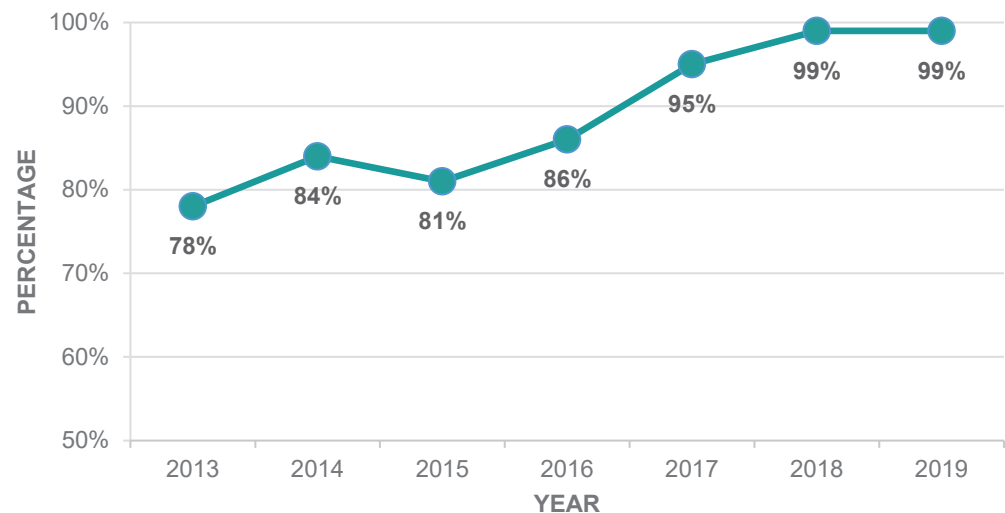


FIGURE 4.8: IHFD COVERAGE BY YEAR, 2013–2019

BPT PAYMENTS BY HOSPITAL

In 2018, the first financial payments of the BPT were issued to the hospitals. In 2019, a total of €98,000 was paid out to 12 hospitals for quarter one, €140,000 was paid out to 14 hospitals for quarter two, €135,000 was paid out to 13 hospitals for quarter three, and €175,000 was paid out to 15 hospitals for quarter four. The total paid out as a result of the BPT for 2019 was €548,000.

This is a substantial amount of money and has been shown to have had a positive effect on the system overall, highlighting that 15% of patients with a hip fracture received the best practice standard of care in 2019, which represents an improvement of eight percentage points from 2018. The total payments that each hospital received for each quarter in 2019 are presented in Table 4.2.

The money from the BPT was used at hospital level for the purchase of the following items to support the care of hip fracture patients:

- warming blankets for operating theatres
- doppler ultrasound
- pressure-relieving devices
- bladder scanners
- comfort equipment for patients
- hoists
- physiotherapy equipment
- piloting new services, such as early supported community discharge.

Money was also allocated for the training and education of staff, including supporting staff to attend conferences and training (i.e. casting courses), and to carry out research.

TABLE 4.2: TOTAL BPT PAYMENTS, BY QUARTER AND HOSPITAL, 2019

Hospital	Q1 2019	Q2 2019	Q3 2019	Q4 2019	Total 2019
Midland Regional Hospital Tullamore	€9,000	€12,000	€7,000	€13,000	€41,000
St James's Hospital	€2,000	€1,000	€3,000	€5,000	€11,000
Tallaght University Hospital	€ –	€1,000	€ –	€3,000	€4,000
Mater Misericordiae University Hospital	€ –	€6,000	€7,000	€7,000	€20,000
St Vincent's University Hospital	€21,000	€27,000	€17,000	€20,000	€85,000
Connolly Hospital Dublin	€8,000	€4,000	€7,000	€11,000	€30,000
Our Lady of Lourdes Hospital Drogheda	€7,000	€18,000	€18,000	€26,000	€69,000
Beaumont Hospital Dublin	€2,000	€5,000	€11,000	€6,000	€24,000
Letterkenny University Hospital	€2,000	€7,000	€6,000	€6,000	€21,000
Sligo University Hospital	€15,000	€9,000	€6,000	€5,000	€35,000
University Hospital Galway	€4,000	€6,000	€7,000	€8,000	€25,000
Mayo University Hospital	€ –	€ –	€ –	€6,000	€6,000
University Hospital Waterford	€2,000	€3,000	€4,000	€11,000	€20,000
Cork University Hospital	€4,000	€27,000	€26,000	€30,000	€87,000
University Hospital Kerry	€ –	€ –	€ –	€ –	€ –
University Hospital Limerick	€22,000	€14,000	€16,000	€18,000	€70,000
Total	€98,000	€140,000	€135,000	€175,000	€548,000

BPT PAYMENTS AS A PROPORTION OF PATIENT VOLUME BY HOSPITAL

Each of the 16 hospitals participating in the IHFD have a different volume of hip fracture patients, ranging from 116 to 437. Figure 4.9 shows what percentage of each hospital's patients met the BPT as a proportion of their overall volume of hip fracture patients. Figure 4.9 shows that 15% of patients with a hip fracture received the best practice standard of care in 2019; this represents an improvement of eight percentage points from 2018.

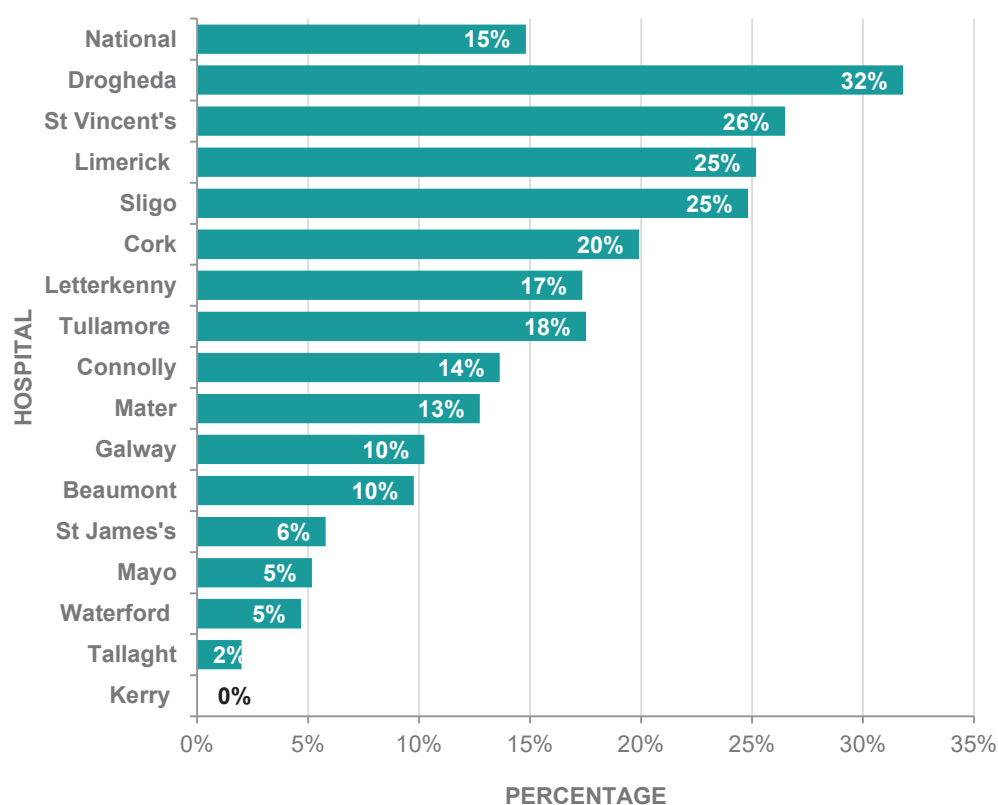


FIGURE 4.9: PROPORTION OF PATIENTS MEETING BPT BY HOSPITAL

GOLDEN HIP AWARD WINNER 2019

Since 2017, the IHFD has been awarding the Golden Hip Award to the hospital which has the highest proportion of patients meeting the IHFS and BPT. In 2019, this was awarded to Our Lady of Lourdes Hospital Drogheda, as 32% of all patients met the BPT (Figure 4.9). Our Lady of Lourdes Hospital Drogheda has written a description below of the work it has undertaken locally to achieve the BPT.

OUR LADY OF LOURDES HOSPITAL DROGHEDA

Our Lady of Lourdes (OLOL) Hospital Drogheda is a 340-bed hospital with a large catchment area across Louth, Meath, Monaghan, Cavan and north Dublin, with a population of approximately 350,000. It is a busy hospital, with 12,786 medical admissions, 3,959 surgical admissions, 1,908 orthopaedic admissions, and 1,306 gynaecology admissions in 2019.

The orthopaedic service is based on a new 31-bed unit which opened at the end of December 2018. The Orthopaedic service at OLOL Hospital has a busy adult emergency trauma service, while elective surgery is predominantly carried out at Our Lady's Hospital, Navan. In addition, there is a paediatric Orthopaedic service, as well as day case and short-stay services at OLOL Hospital. Hip fracture patients from Co Cavan are redirected to Connolly Hospital Dublin, with the exception of some complex periprosthetic hip fracture patients. There are nine orthopaedic consultant surgeons, and one orthogeriatrician who was appointed in August 2018.

The Orthopaedic team initially set up a local Hip Fracture Register in Drogheda in 2011. Following on from this, a Fracture Neck of Femur group in OLOL Hospital was established in the summer of 2013. At this time, there were between 250 and 300 hip fracture patients operated on in OLOL Hospital every year, which was among the highest volumes of such patients in Ireland. This group set about developing an integrated hip fracture care pathway through collaboration of the Orthopaedic Lead and Chair, with the Trauma Nurse Coordinator, the Anaesthetic Lead, the Emergency Department Lead, the Orthopaedic Clinical Nurse Managers, the Physiotherapy Lead, the Occupational Therapy Lead, the Director of

Nursing, and the Senior Nursing Management team. Subsequently, OLOL Hospital began to participate in the IHFD in 2013. The Fractured Neck of Femur group continued to meet on a regular basis with the aim of improving the IHFS at OLOL Hospital, and has since become the hospital's HFGC.

In 2019, 217 hip fracture patients attended OLOL Hospital. This was similar to 2018, with 219 hip fracture patients attending for emergency care. The orthogeriatrics service was established at the end of August 2018. It provides proactive care for older people undergoing emergency orthopaedic surgery. All hip fracture patients aged over 60 years are seen pre-operatively and, where possible, are provided with an early Comprehensive Geriatric Assessment, delirium screening, frailty assessment and medically optimisation. These patients are followed routinely by the orthogeriatrics team throughout the course of their admission, with weekly Multi Disciplinary Team (MDT) meetings to guide progress with rehabilitation and discharge destinations. Our excellent orthopaedic nursing colleagues with specialist trauma nursing skills are also expanding upon their skill set in geriatric nursing, which is essential in providing optimal care to this older, frail, multimorbid cohort of patients. There is strong nursing leadership with participation on the orthogeriatrics and orthopaedic ward rounds, at the MDT meetings, and at care planning meetings.

The Trauma Coordinator role has developed significantly since 2013 and provides an important link between the ED, orthopaedic ward, operating theatre, orthopaedic team, and orthogeriatrics team. Our Trauma Coordinator

is also essential in inputting the data on hip fracture patients into the IHFD. The orthopaedic service has a well-established multidisciplinary team comprising specialist physiotherapists, an occupational therapist, a dietitian, and a speech and language therapist as required. The flexible, dynamic nature of the entire team involved in hip fracture patient care, from the first patient contact to home discharge, has led to improvements in the IHFS. Each multidisciplinary team member has excellent leadership skills and every team member's individual contribution is valued, with interdisciplinary learning encouraged at all times.

Following review of the 2018 IHFS at OLOL Hospital, it was evident that our principal challenge was IHFS 1 (admission to the orthopaedic ward within 4 hours). The Hip Fracture Pathway Subgroup was set up in February 2019 to address IHFS 1. In advance of the group's first meeting, an audit of the reasons for delays to the ward in January 2019 was conducted by the Trauma Coordinator. Alarming, we discovered that 0% of patients made it to the ward within 4 hours in January 2019. The Hip Fracture Pathway Subgroup brought together all essential disciplines directly involved in IHFS 1. The group included orthogeriatrics, ED CNM2 and Assistant Director of Nursing (ADON), ED Specialist Registrar radiology representative senior radiographer, bed management including bed manager and unscheduled care, Trauma Coordinator, Orthopaedic ADON, Fracture Liaison Advanced Nurse Practitioner (ANP), and the Orthopaedic team. A previous hip fracture pathway in operation was reviewed and further developed based on feedback from the group at every meeting. Repeated audits of delays in reaching the ward led to fine-tuning of the hip fracture pathway and improvements in teamwork. Additionally, the orthogeriatrics team highlighted the importance of the orthopaedic team's contribution in assessing hip fracture patients in a timely manner at admission. Through close collaboration with the Hip Fracture Pathway Subgroup, improvements in IHFS 1 continued every month, with 90% of hip fracture patients in June 2019 reaching the ward within 4 hours. IHFS 1 improved from an average of 15% in 2018 to an average of 56% in 2019. We finished the year on a high, with 78% of our hip fracture patients reaching the orthopaedic ward within 4 hours in the final quarter of 2019.

Continued work by the invaluable MDT and orthopaedic nurses has ensured that the pressure ulcer rate (IHFS 3) has remained as low as possible at 2% in 2019, down from 3% in 2018 and below the national average, in keeping with the ethos of the Pressure Ulcer to Zero (PUTZ) initiative. IHFS 4, 5 and 6 were achieved by establishing the orthogeriatric service, which focuses on reducing future falls, syncope, and fracture risk through a comprehensive geriatric assessment, a focused history and collateral history, an examination, investigations, a medication review, a management plan in relation to falls and syncope, and an individualised bone protection plan. The MDT also assesses each patient in relation to falls risk and collaborates with the orthogeriatrics service on the ward and at weekly MDT meetings. The addition of a dedicated Fracture Liaison Service (FLS) ANP has also ensured that each bone protection plan is carefully developed following initial workup and is scheduled to ensure adherence. The FLS ANP has started to develop an FLS service which aims to capture all fractures and will include hip fracture patients and all fragility fracture patients. The Senior Management Team has been very supportive of developments within the service, and their continued support is greatly appreciated.

IHFS 2 (receive surgery within 48 hours) has continued to remain a challenge due to competing theatre time for paediatric patients and no dedicated hip fracture operating slots. A second operating theatre is due to open soon with dedicated hip fracture slots. Furthermore, our length of stay has been a challenge due to our large catchment area with very limited rehabilitation options. In fact, up until May 2020, there was no access to dedicated rehabilitation beds for any orthopaedic patients. A new orthogeriatrics Rehabilitation service has opened in Louth County Hospital Dundalk, but this will need to be adequately resourced with a full, dedicated MDT in order to deliver rehabilitation services successfully. If this service is properly resourced, patients will receive timely rehabilitation without delays in transfer from OLOL Hospital, therefore reducing their length of stay, improving patient outcomes, and increasing discharges home.

Thirty-two percent (n=69) of our patients met

all six IHFS in 2019, giving us BPT payments totaling €69,000, which represents a significant improvement from 4% in 2018. The HFGC is reviewing each department's 'wish list' at present, and to date has agreed by consensus to fund the intravenous Zoledronic acid day hospital pathway and to purchase additional Lo-Lo beds, specialist seating, and physiotherapy stairs equipment. Future education and research projects will also be supported.

The entire team is delighted to receive the Golden Hip Award, as it reflects the team's hard work and dedication in providing the best possible quality of care to our patients. It is a further endorsement of the importance of audit in improving performance against the IHFS as set out by NOCA. We will continue to strive for excellence in these challenging times so that our patients continue to receive the right care, in the right place, at the right time, with the right team.



This picture of the Hip Fracture Governance Committee in Drogheda was taken during the COVID-19 pandemic hence the social distancing observed in the photograph. (L to R) Front row: Pheadra Monahan, Orthopaedic Trauma Coordinator, Mr Niall O'Connor Emergency Department Consultant, Mr Anant Mahapatra Orthopaedic Clinical Lead and Consultant, ***2nd row:*** Dr Helen O'Brien Orthogeriatrician Consultant, Prof. Sherif El Masery Surgical Clinical Director, ***3rd row:*** Aine Davern, ADON Orthopaedics, Debbie McDaniel MTA Audit Coordinator OLOL & Assistant NOCA Audit Manager INOR, Orla Cooney CNM1 Orthopaedic Theatre, Fiona Brady General Manager ***4th row:*** Thelma Halpin CNM2 Orthopaedics, Iffat Sohail, Senior Occupational Therapist, Eilis Hand Senior Orthopaedic Physiotherapist, Nikki Knight CNM3 Orthopaedics, Shirley Timmons, Head of Bed Management, ***5th row:*** Lorraine Reynolds ADON Emergency Department ***Colleagues in absentia:*** Ciaran Conlon ADON Emergency Department, Bernadette Conlon ANP Fragility Fractures, Danielle Carolan CNM2 Clinical Facilitator, Eleanor Campbell Senior Radiographer Emergency Department, Eithne Dunnill Unscheduled care ADON, Ashleigh Levondale Orthopaedic SPR, Mr Alan Walsh Orthopaedic Consultant, Mr Conor Kelly Emergency Department Consultant, Shavitha Polouse CNM1 Orthopaedics, Patricia Byrne CNM1 Orthopaedics, Paddy Hillery SPR Emergency Department, Sarah Mc Shane Senior Orthopaedic Physiotherapist, Aisling Gernon Speech and Language Therapist, Anne Grogan Dietician, Elaine Mc Cabe Physiotherapist, Pauric Greene Physiotherapist, Jarlith Lyons Senior Physiotherapist, Janet Griffin Physiotherapy Assistant, Charlie Gordon CNM2 Orthopaedic Theatre, Mr Alan Walsh Orthopaedic Consultant, Mr Aaron Glynn Orthopaedic Consultant, Mr Nasir Awan Orthopaedic Consultant, Mr Amir Siddique Orthopaedic Consultant, Mr Paul Harrington Orthopaedic Consultant, Mr Murali Sayana Orthopaedic Consultant, Mr Khalid Khan Orthopaedic Consultant, Mr Kishwar Srikumar Orthopaedic Consultant.

KEY FINDINGS FROM CHAPTER 4

- In 2019, 95% of patients were admitted to an orthopaedic ward, compared with 91% in 2018.
- One-quarter of patients were admitted to an orthopaedic ward or to the operating theatre from the ED within 4 hours, compared with only 17% of patients in 2018.
- In 2019, 76% of surgeries were conducted within 48 hours and within normal working hours. This has improved by four percentage points since 2018, and the median time to surgery has decreased by 1 hour to 26 hours.
- A geriatrician reviewed 82% of patients at some point during their acute stay in 2019. This represents a considerable improvement from 2018, when only 69% of patients were reviewed by a geriatrician during their stay.
- In 2019, a bone health assessment was carried out on 94% of patients nationally (compared with 84% in 2018). Fourteen of the participating hospitals achieved at least 90% compliance with this standard in 2019. There was also a greater percentage of patients being discharged on definitive treatment (71% in 2019 versus 62% in 2018).
- Prior to discharge, 83% of patients nationally had a specialist falls assessment in 2019, compared with only 70% in 2018.
- There continues to be variability in the level of compliance in the IHFS at hospital level.
- The total money paid out as a result of the BPT for 2019 was €548,000, with 15% of all hip fracture patients nationally meeting the IHFS and achieving the BPT. This represents an improvement of eight percentage points from 2018.
- Our Lady of Lourdes Hospital Drogheda had the highest proportion of patients meeting the BPT, with almost one in three patients achieving this level of care.

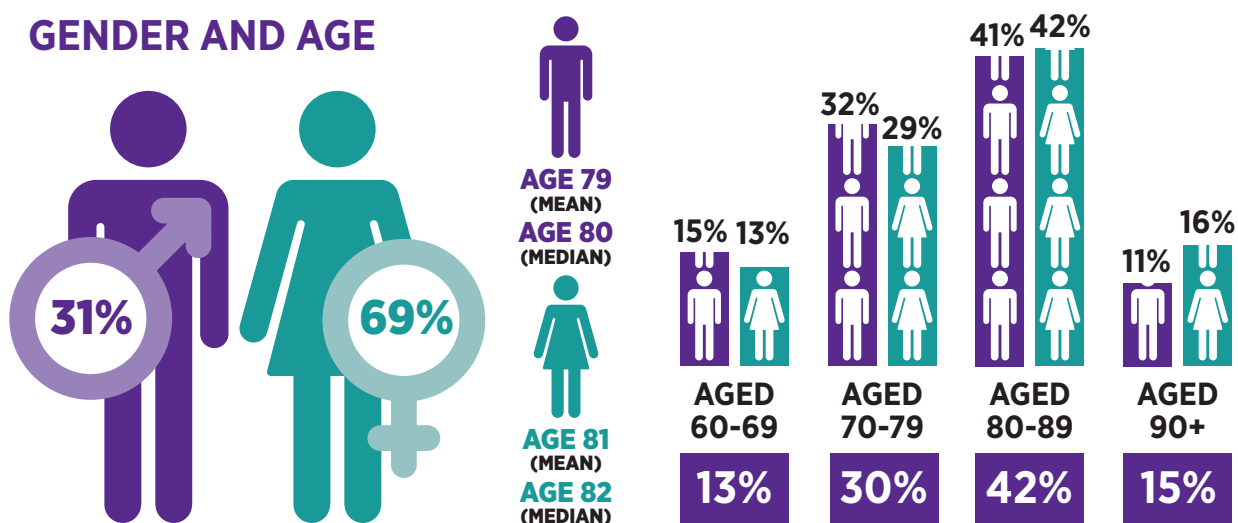
CHAPTER 5

CASE MIX

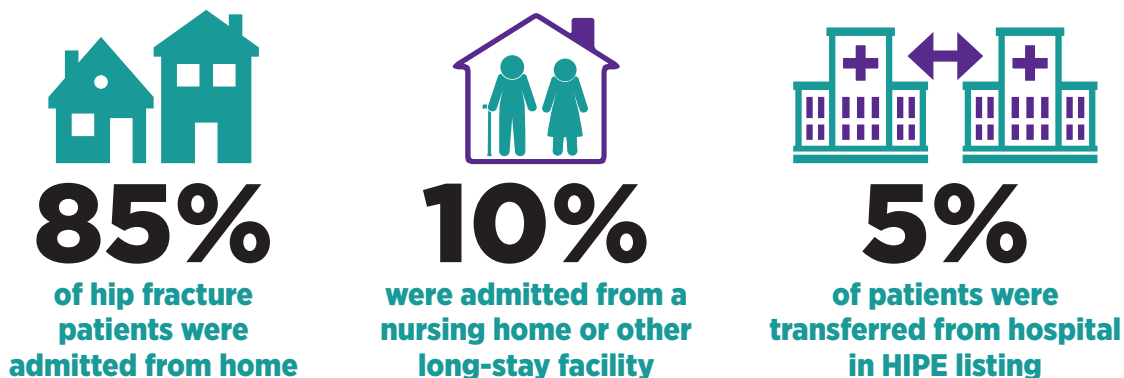


CHAPTER 5: CASE MIX

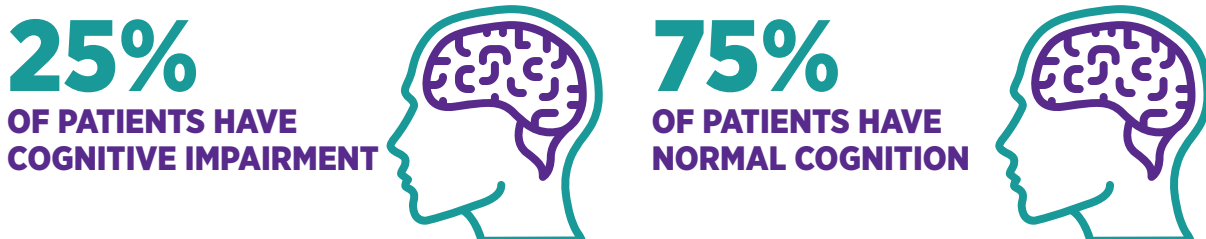
GENDER AND AGE



SOURCE OF ADMISSION

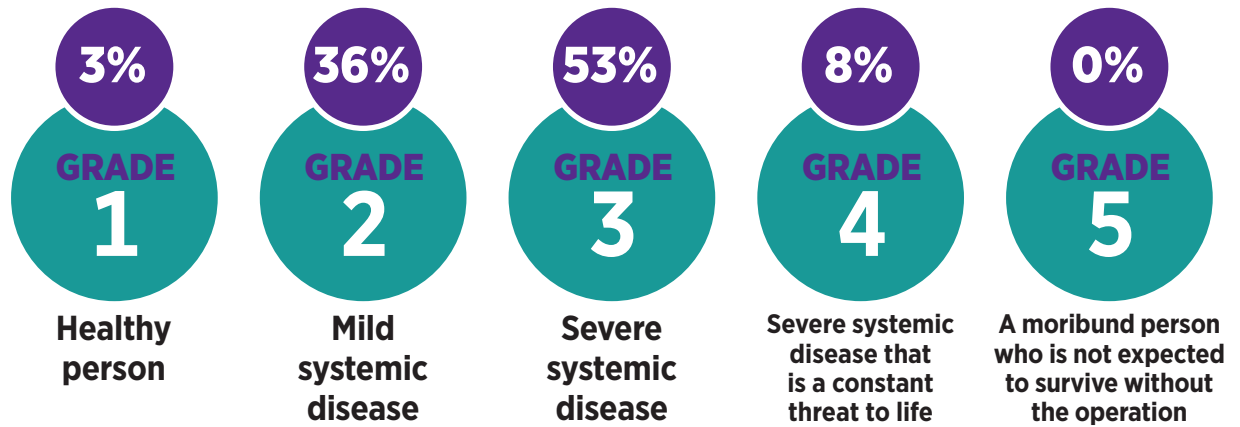


ABBREVIATED MENTAL TEST (AMT)⁷



⁷ An AMT score was recorded for 623 patients only

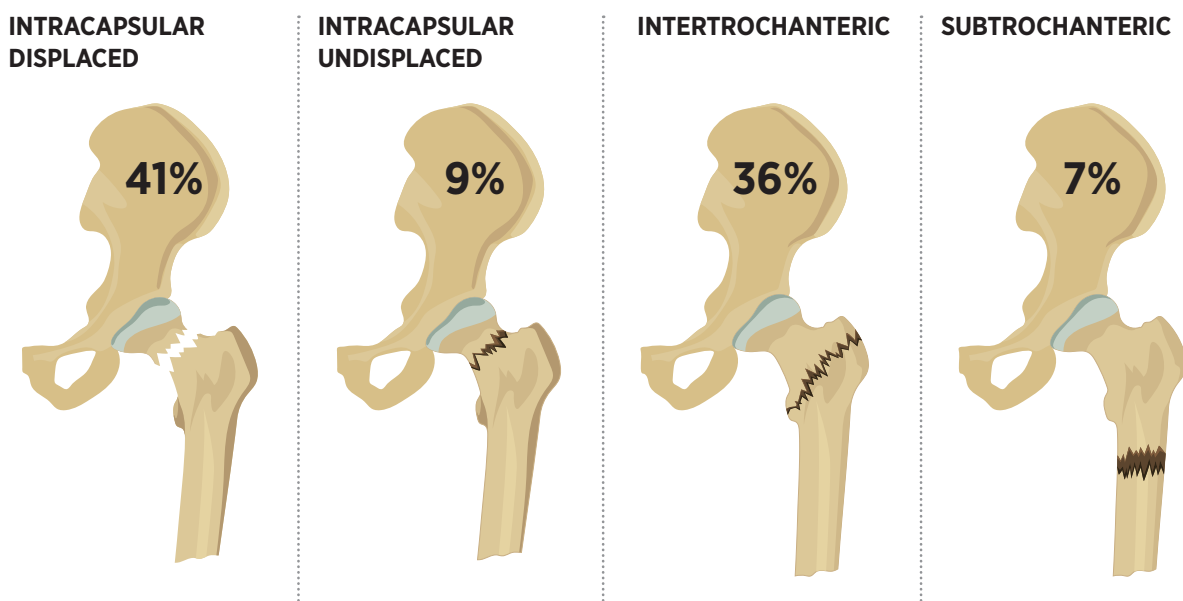
AMERICAN SOCIETY OF ANESTHESIOLOGISTS (ASA) PHYSICAL STATUS CLASSIFICATION (DRIPPS, 1963)⁸



PRE-FRACTURE MOBILITY⁹



FRACTURE TYPE

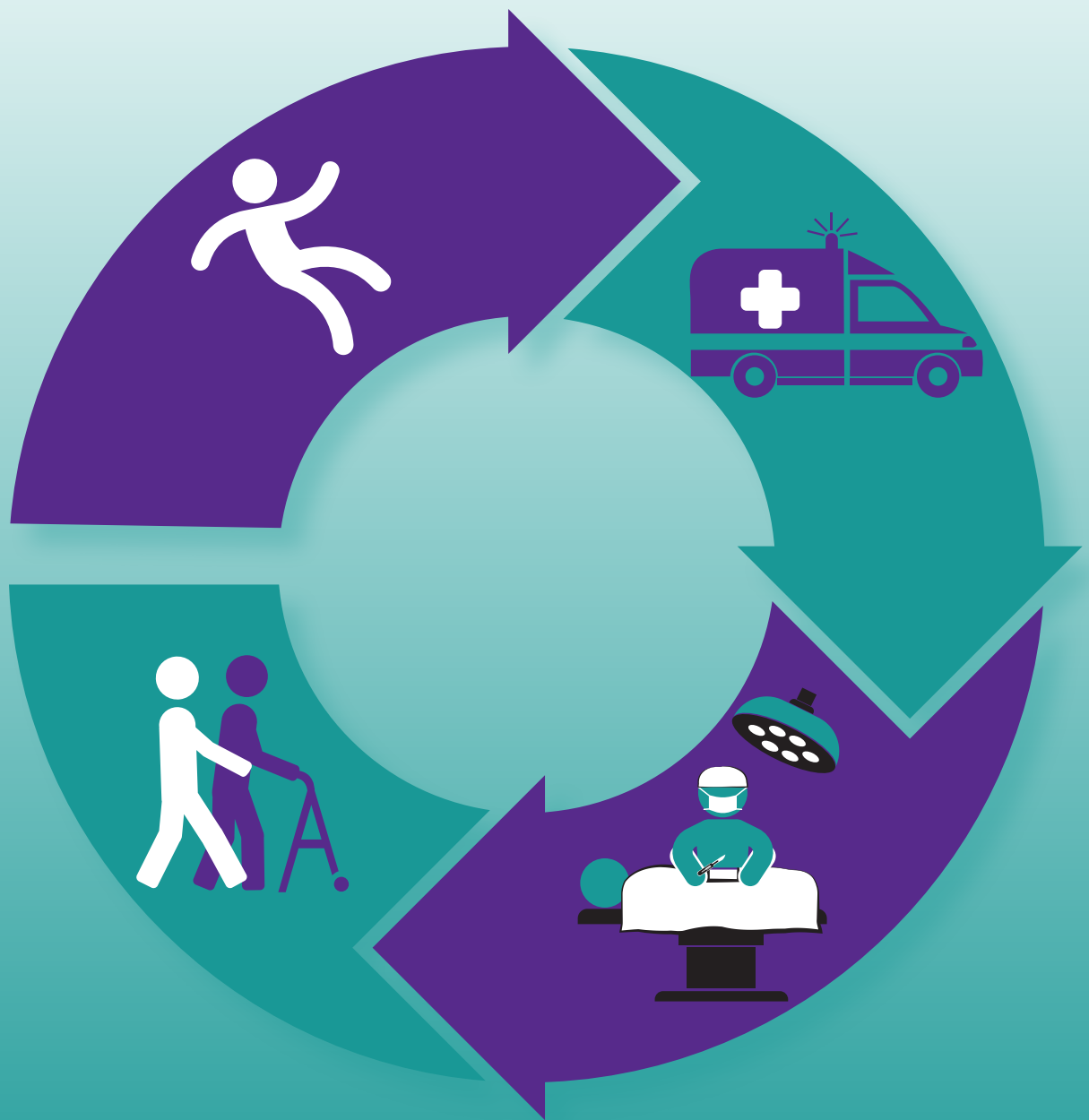


⁸ 320 patients did not have an ASA grade recorded and have been excluded from the analysis.

⁹ Only patients with scores for all three types of mobility are included in this analysis; 211 patients did not have an NMS recorded for either indoor walking, outdoor walking, or shopping.

CHAPTER 6

PATIENT PATHWAY

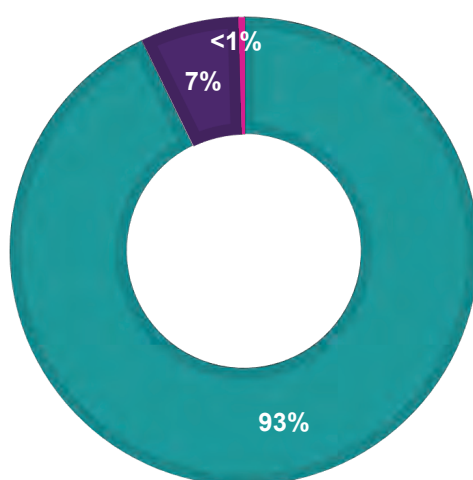


CHAPTER 6: PATIENT PATHWAY

MODE OF ADMISSION TO HOSPITAL

Figure 6.1 shows that 93% (n=3435) of patients presented directly to an ED in an operating hospital; this has increased slightly since 2018 and is a direct result of the IHFD data being used by the Clinical Programme for Trauma and Orthopaedic Surgery, the NAS, the DFB, and the HSE to introduce a national bypass for hip fracture. This work is still ongoing and is currently being reviewed by the HSE National Office for Trauma Services. A further 7% (n=250) of patients were transferred from an ED in a non-operating hospital to a ward in an operating hospital and were seen by an 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 77% to 100% in 2019.

93% of patients presented directly to an ED in an operating hospital



■ Directly To ED in an operating hospital ■ Seen by an orthopaedic team ■ Not known

FIGURE 6.1: MODE OF ADMISSION TO OPERATING HOSPITAL (N=3701)¹⁰

¹⁰ Percentages may not sum to 100% due to rounding.

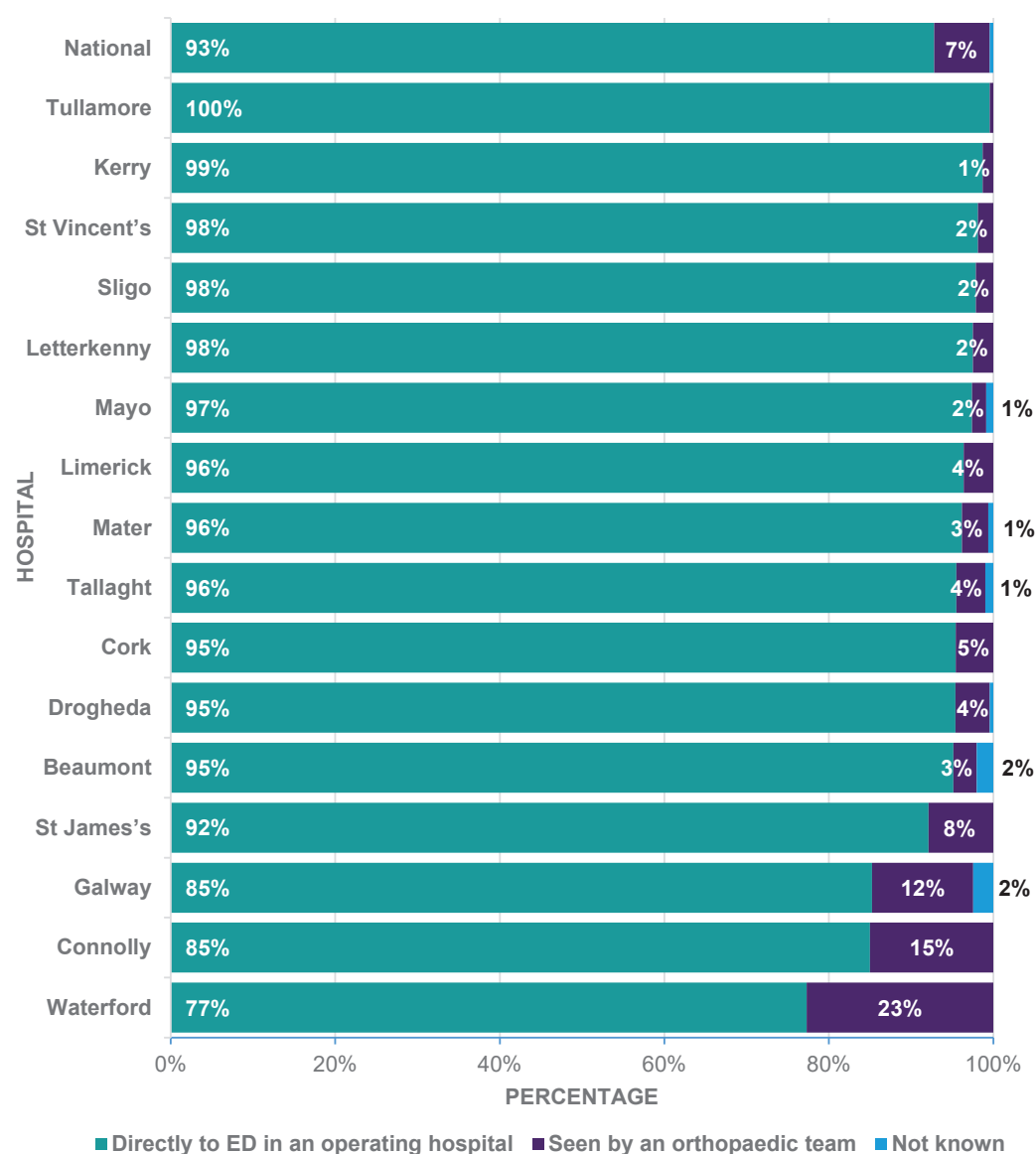


FIGURE 6.1A: MODE OF ADMISSION TO OPERATING HOSPITAL, BY HOSPITAL (N=3701)¹¹

¹¹ Percentages may not sum to 100% due to rounding.

REASON FOR DELAY TO SURGERY

Almost one-quarter (24%, n=836) of patients received surgery more than 48 hours after their admission to hospital. For 7% (n=59), no reason was given for their delay to surgery. Completion of this data field has improved significantly following the introduction of the new data validation process. For the 777 patients who had a recorded reason for delay, 'Awaiting medical review, investigation, or stabilisation' (58%, n=452) was the most common reason provided. This was followed by 'Awaiting space on theatre list' (14%, n=112) (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	19	2%
Awaiting medical review, investigation, or stabilisation	452	58%
Awaiting inpatient or high-dependency bed	12	2%
Awaiting space on theatre list	112	14%
Problem with theatre/equipment	7	1%
Problem with theatre/surgical/anaesthetic staff cover	34	4%
Cancelled due to list over-run	29	4%
Other	27	3%
Not known	85	11%
Total	777	100%

CUMULATIVE TIME TO SURGERY

Figure 6.2 shows that 43% (n=1533) of patients received their surgery within 24 hours, 60% (n=2114) within 36 hours, and 76% (n=2700) within 48 hours of presentation, although some of these patients received their surgery outside of working hours (n=28). This represents a small improvement since 2018. In 2020, the percentage of patients who received their surgery within 24, 36 and 48 hours will continue to be reported quarterly.

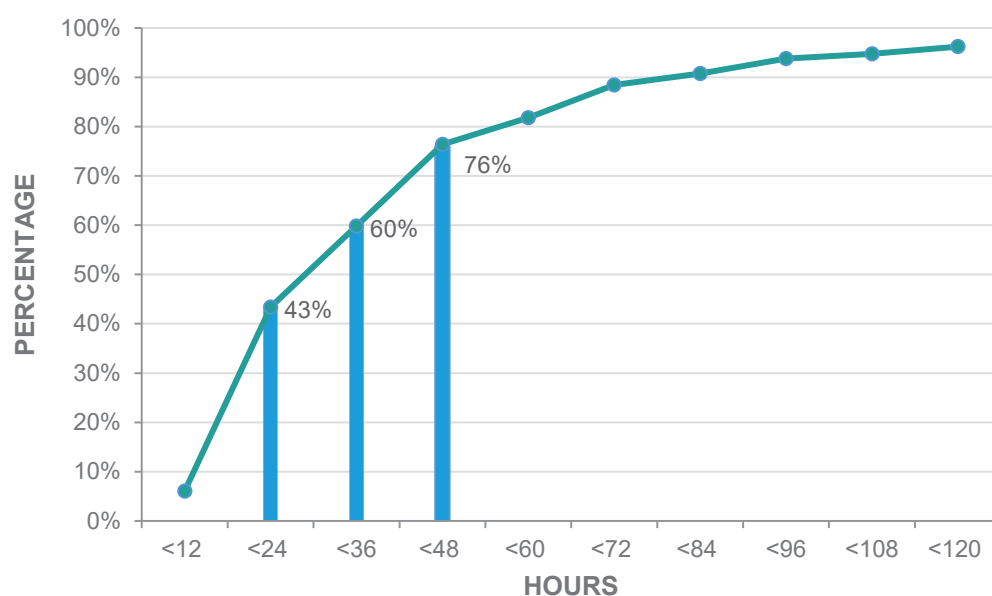


FIGURE 6.2: CUMULATIVE TIME TO SURGERY (n=3536)¹²

¹² 165 patients did not have surgery.

TYPE OF ANAESTHESIA

Spinal anaesthetic (SA) only continues to be the predominant type of anaesthesia used (53%, n=1886) (Figure 6.3). It is also used in combination with general anaesthetic (GA) (3%, n=108) or, increasingly, with a nerve block (21%, n=757). Figure 6.3A displays this information at hospital level. There appears to be a large variation in the type of anaesthesia used in hospitals; however, most hospitals predominantly used SA on their patients. This year is the first time that the percentage of patients receiving a nerve block pre-operatively is being reported at hospital level (Figure 6.4). This pain management intervention reduces the need for opioid analgesia and has been associated with better pain management in the perioperative and postoperative period (Ritcey *et al.*, 2016). There appears to be a large variation in pre-operative nerve block use in hospitals, with figures ranging from 10% to 95%. Further improvements in the level of reporting for this variable are expected over time.

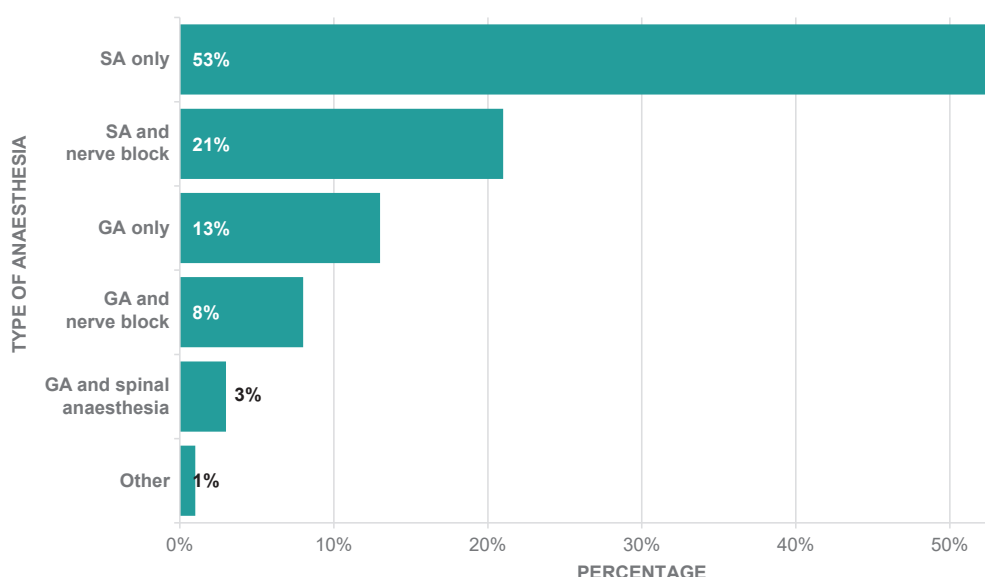


FIGURE 6.3: PERCENTAGE OF PATIENTS BY TYPE OF ANAESTHESIA (n=3536)^{13, 14}

¹³ 165 patients did not have surgery and have been excluded from analysis.

¹⁴ Please note percentages may not sum to 100% due to rounding.

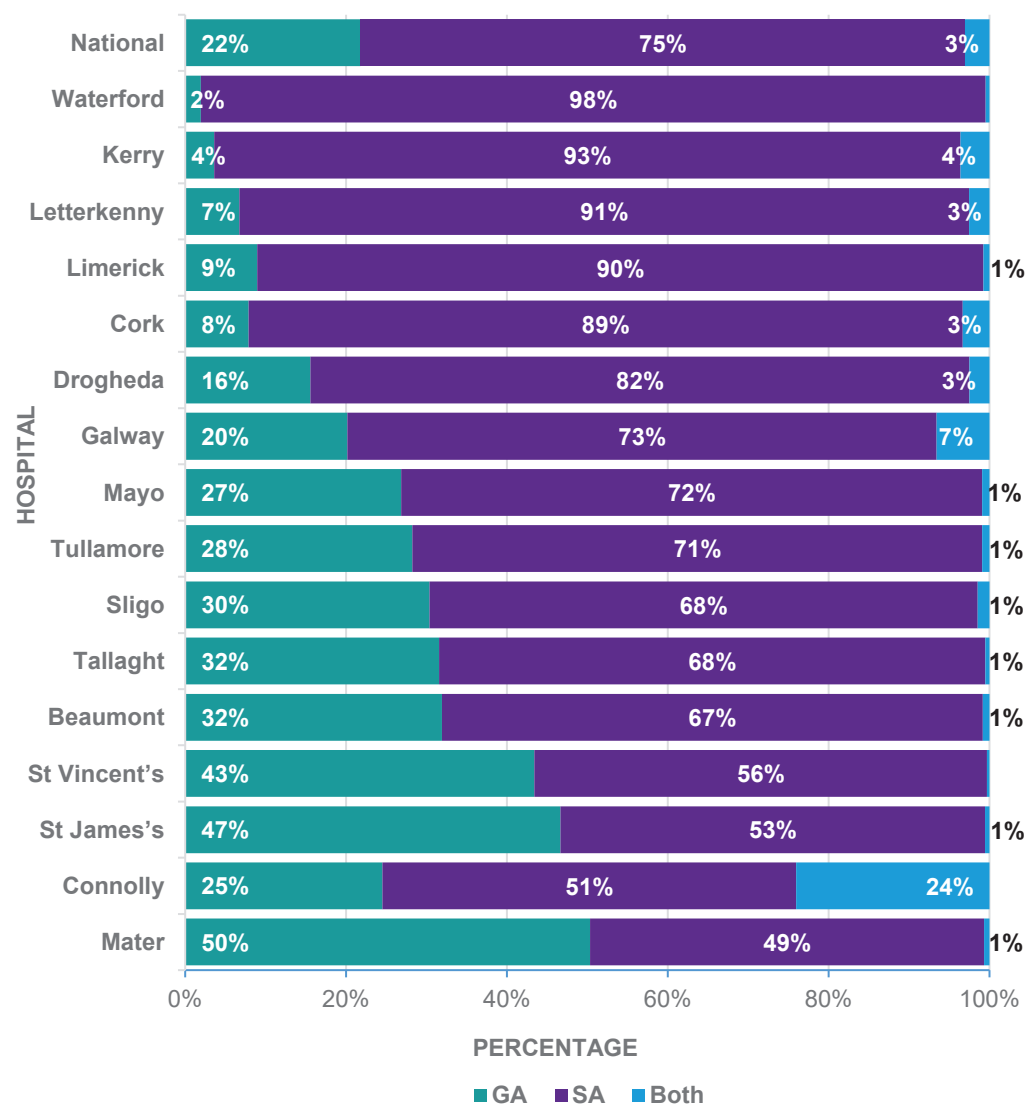


FIGURE 6.3A: PERCENTAGE OF PATIENTS BY TYPE OF ANAESTHESIA, BY HOSPITAL
(n=3521) ^{15, 16}

¹⁵ 165 patients did not have surgery and 15 patients were not categorised as receiving either GA or SA. They have been excluded from the analysis.

¹⁶ Please note percentages may not sum to 100% due to rounding.

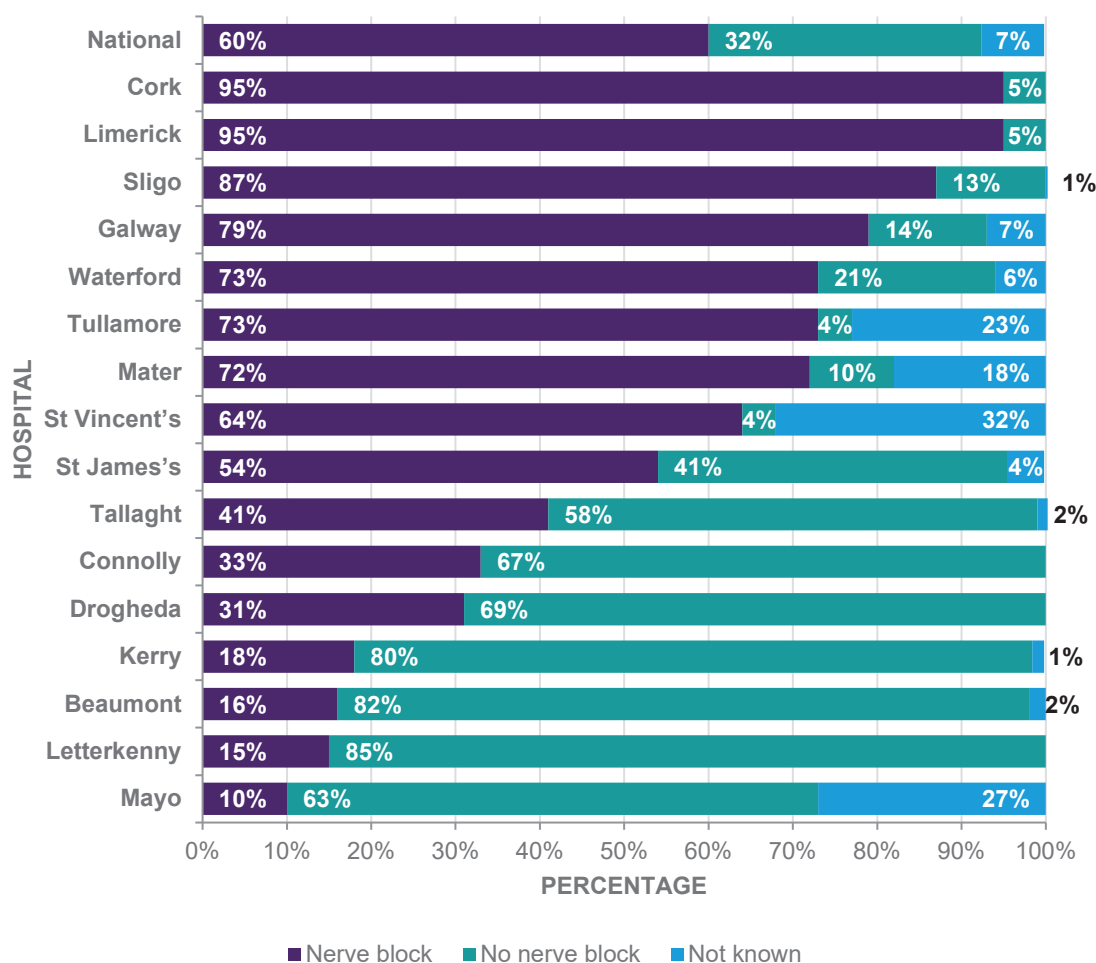


FIGURE 6.4: PERCENTAGE OF PATIENTS RECEIVING PRE-OPERATIVE NERVE BLOCK (n=3536) ^{17, 18}

¹⁷ 165 patients did not have surgery and have been excluded from analysis.

¹⁸ Please note percentages may not sum to 100% due to rounding.

NUTRITIONAL RISK ASSESSMENT

Nutritional risk assessment was introduced to the IHFD dataset in 2018. The purpose of this variable is to determine the percentage of patients who have had a nutritional risk assessment during admission and to ascertain the level of risk of those patients. Evidence shows that nutrition is a key modifiable risk factor for survival following hip fracture, with poor nutrition contributing to the risk of death after hip fracture (Johansen *et al.*, 2017; Duncan *et al.*, 2006). Malnutrition can play a key role in determining a patient's recovery and outcomes following hip fracture and reflects the multidisciplinary nature of hip fracture patients' care. Figure 6.5 shows that half of hip fracture patients did not have a nutritional risk assessment during admission in 2019. Thirty-eight percent (n=1404) were within normal limits, 11% (n=390) were at risk of malnourishment and 1% (n=52) are categorised as malnourished. Although this is still early data, there is large variation in the proportion of assessments that were performed. The IHFD will continue to record this variable and in time these data will provide valuable insights into the nutritional status of hip fracture patients.

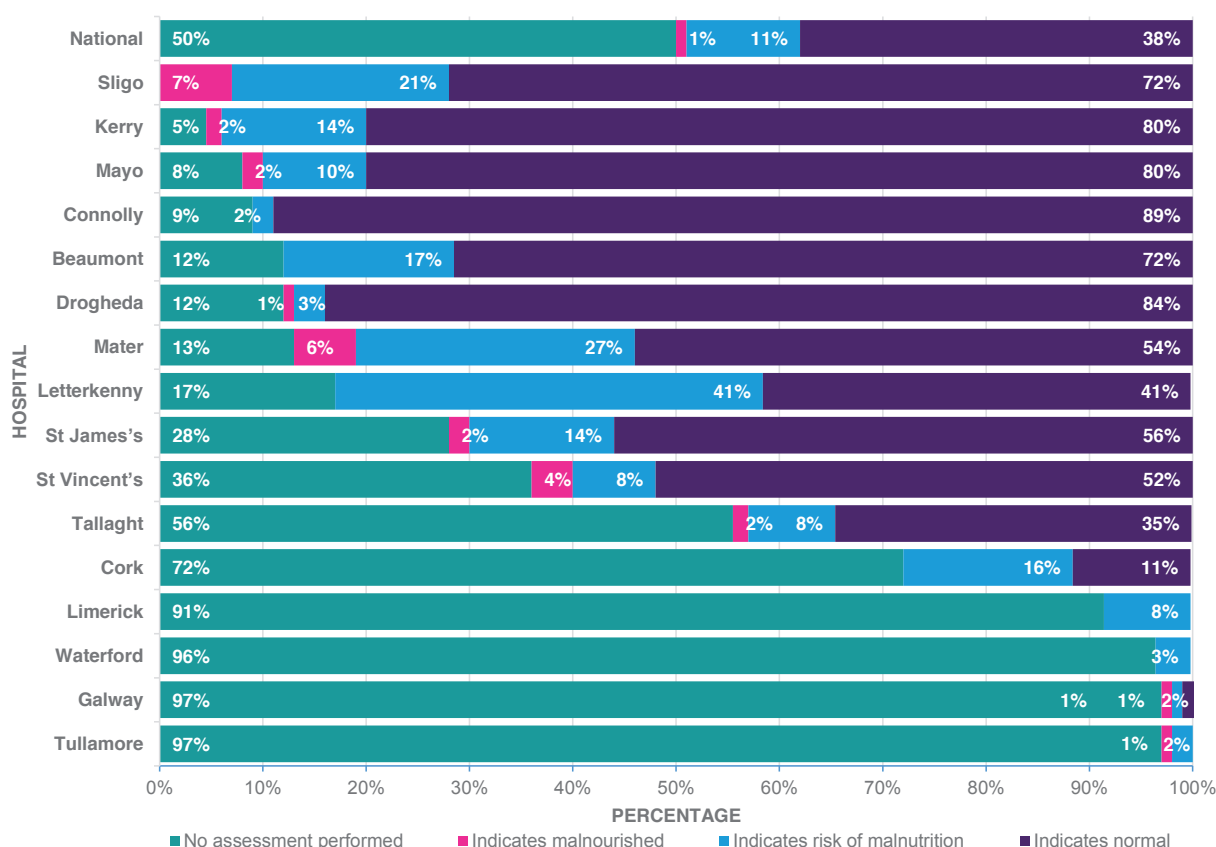


FIGURE 6.5: PERCENTAGE OF PATIENTS BY NUTRITIONAL RISK ASSESSMENT (N=3701)¹⁹

¹⁹ Please note percentages may not sum to 100% due to rounding.

TYPE OF SURGERY

Thirty-six percent (n=1282) of patients underwent a cemented hemiarthroplasty and 16% (n=558) Internal fixation IM nail (short) (Figure 6.6). Table 6.2 details the fixation of fractures by fracture type. Ninety-four percent (n=1421) of patients with an intracapsular fracture (displaced) underwent either a hemiarthroplasty or a total hip replacement (THR), whereas 68% (n=199) of patients with an intracapsular fracture (undisplaced) underwent either a hemiarthroplasty or a THR. Ninety-one percent (n=1174) of patients with an intertrochanteric fracture underwent internal fixation, and 93% (n=225) of patients with a subtrochanteric fracture underwent internal fixation.

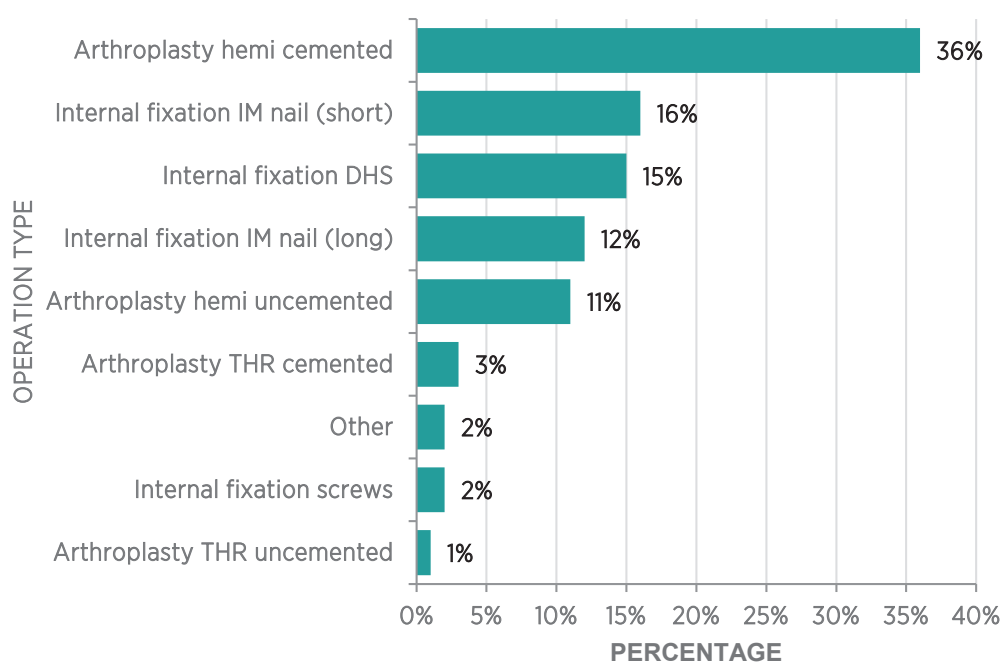


FIGURE 6.6: PERCENTAGE OF PATIENTS BY TYPE OF SURGERY (n=3536) ^{20, 21}

²⁰ 165 patients did not have surgery and have been excluded from analysis.

²¹ Please note percentages may not sum to 100% due to rounding.

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

Type of Operation	Type of fracture			
	Intracapsular (displaced)	Intracapsular (undisplaced)	Intertrochanteric	Subtrochanteric
Internal fixation DHS	3%	18%	32%	5%
Internal fixation screws	0%	12%	2%	1%
Internal fixation IM nail (long)	1%	1%	18%	71%
Internal fixation IM nail (short)	1%	1%	39%	16%
Arthroplasty hemi cemented	65%	47%	5%	3%
Arthroplasty hemi uncemented	22%	14%	1%	0%
Arthroplasty THR cemented	2%	2%	0%	0%
Arthroplasty THR uncemented	5%	5%	1%	0%
Other	0%	0%	1%	3%
Total	100%	100%	100%	100%

Seventy-six percent of arthroplasties reported in 2019 were cemented (n=1399), which was a slight increase over 2018 (Figure 6.7). However, there was a large proportion of patients receiving uncemented implants in a number of hospitals (Figure 6.7A).

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 in 2011, 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 hip fracture 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.

Currently, the IHFD is piloting a new and more detailed list of implant options. It is anticipated that this new variable will be introduced to all hospitals during 2020 and will enable a better understanding of the type and combination of types of implants being used to carry out hip fracture fixation.

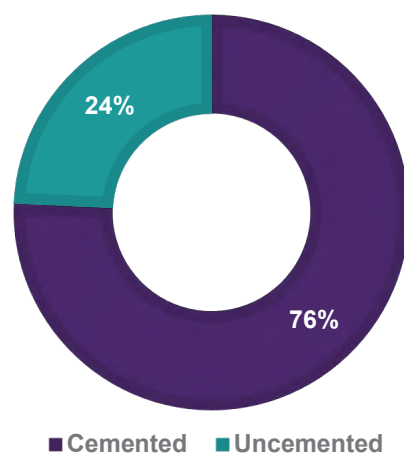


FIGURE 6.7: PERCENTAGE OF PATIENTS WITH CEMENTED OR UNCEMENTED ARTHROPLASTIES (N=1847)²²

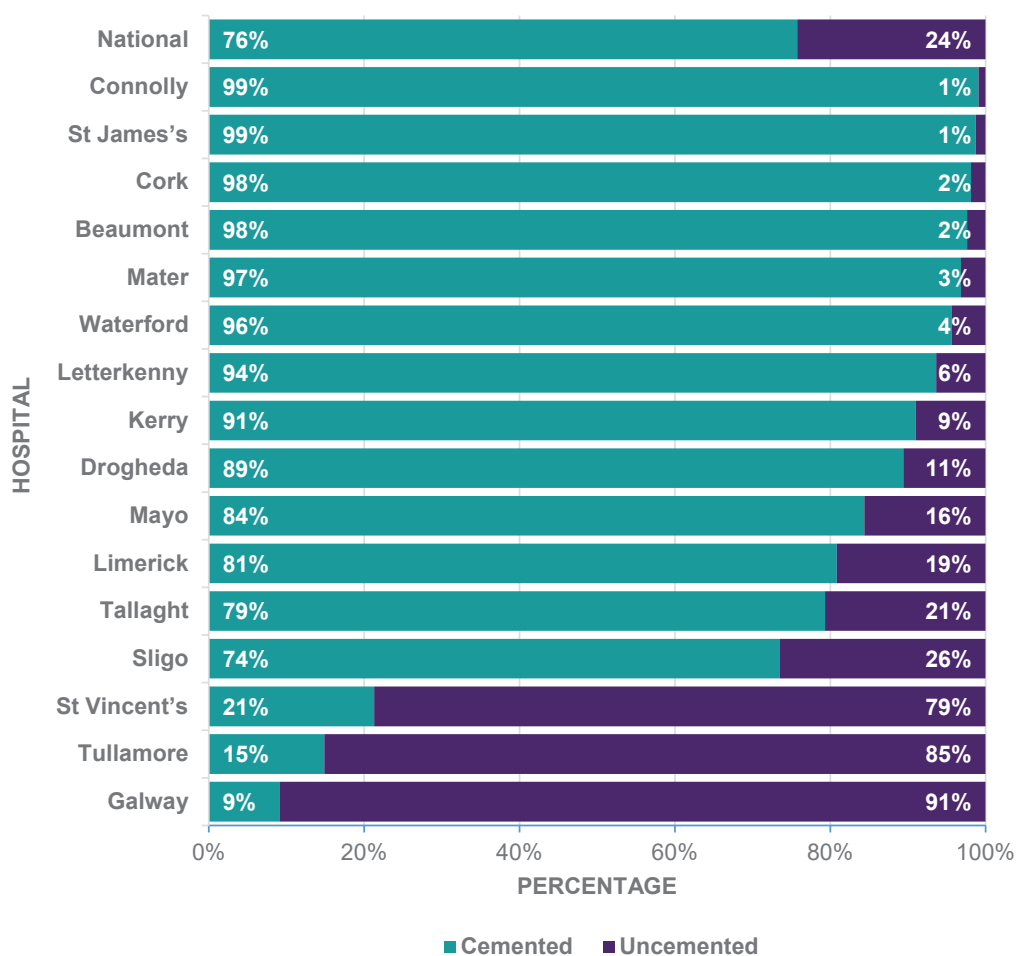


FIGURE 6.7A: PERCENTAGE OF PATIENTS WITH CEMENTED OR UNCEMENTED ARTHROPLASTIES, BY HOSPITAL (n=1847)²³

²² Percentages may not sum to 100% due to rounding.

²³ Percentages may not sum to 100% due to rounding.

MOBILISATION: DAY OF OR DAY AFTER SURGERY AND MOBILISED BY

82% 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). Recent evidence from Ferris *et al.* (2020) indicated that the risk of in-hospital mortality for hip fractures was reduced for those mobilised on the day of or the day after surgery. On the strength of this evidence and the current international consensus on early mobilisation reflected in other hip fracture registries and guidelines e.g Australian and New Zealand Hip Fracture Registry, NICE (2011); Waddell (2011); Scottish Intercollegiate Guidelines Network (2009), the IHFD Governance Committee will introduce a new IHFS (IHFS 7) during 2020.

The new IHFS will measure the percentage of patients mobilised on the day of or the day after surgery, and this will be published in the quarterly reports in 2020 and may become part of the Best Practice Tariff (BPT) in 2021. Other factors taken into account with this standard will include: who mobilised the patient, reason for not mobilising the patient, and the Cumulative Ambulatory Score (CAS) on Day 1 after surgery.

Figure 6.8 shows that 82% of patients were mobilised on the day of or the day after surgery, representing an improvement of five percentage points over 2018. Seventy-seven percent (n=2732) of patients were mobilised by a physiotherapist and 4% (n=157) were mobilised by someone else ('Other'). Figure 6.8A displays this information at hospital level; the percentage of patients mobilised in each hospital on the day of or the day after surgery in 2019 ranged from 59% to 97%. The percentage of patients receiving a physiotherapy assessment in 2019 was also five percentage points higher than in 2018, at 87% (Figure 6.8B).

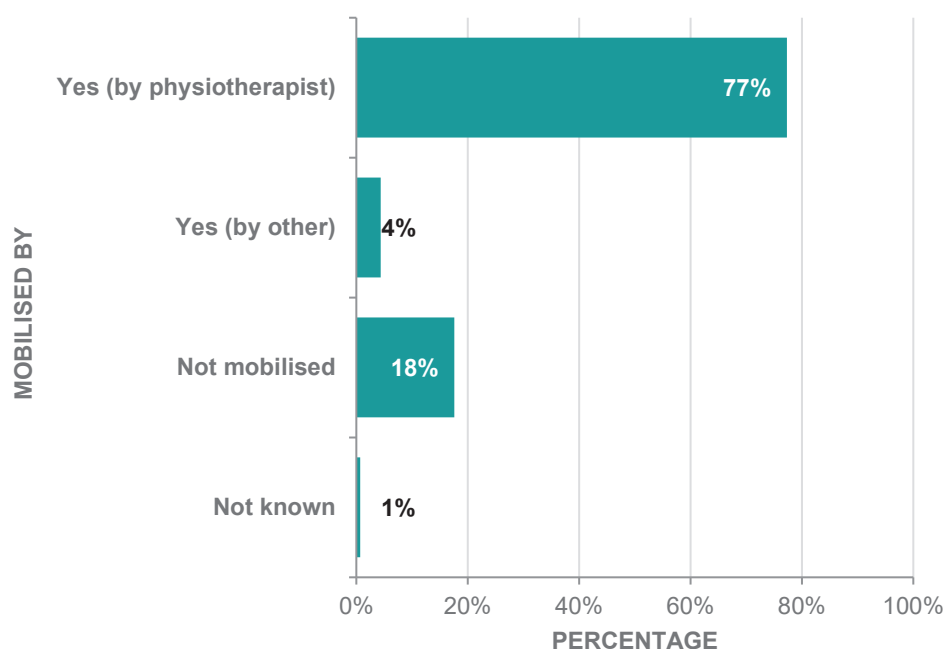


FIGURE 6.8: PERCENTAGE OF PATIENTS BY MOBILISATION DAY OF OR DAY AFTER SURGERY, AND MOBILISED BY (n=3536) ^{24, 25}

²⁴ 165 patients did not have surgery and have been excluded from analysis.

²⁵ Please note percentages may not sum to 100% due to rounding.

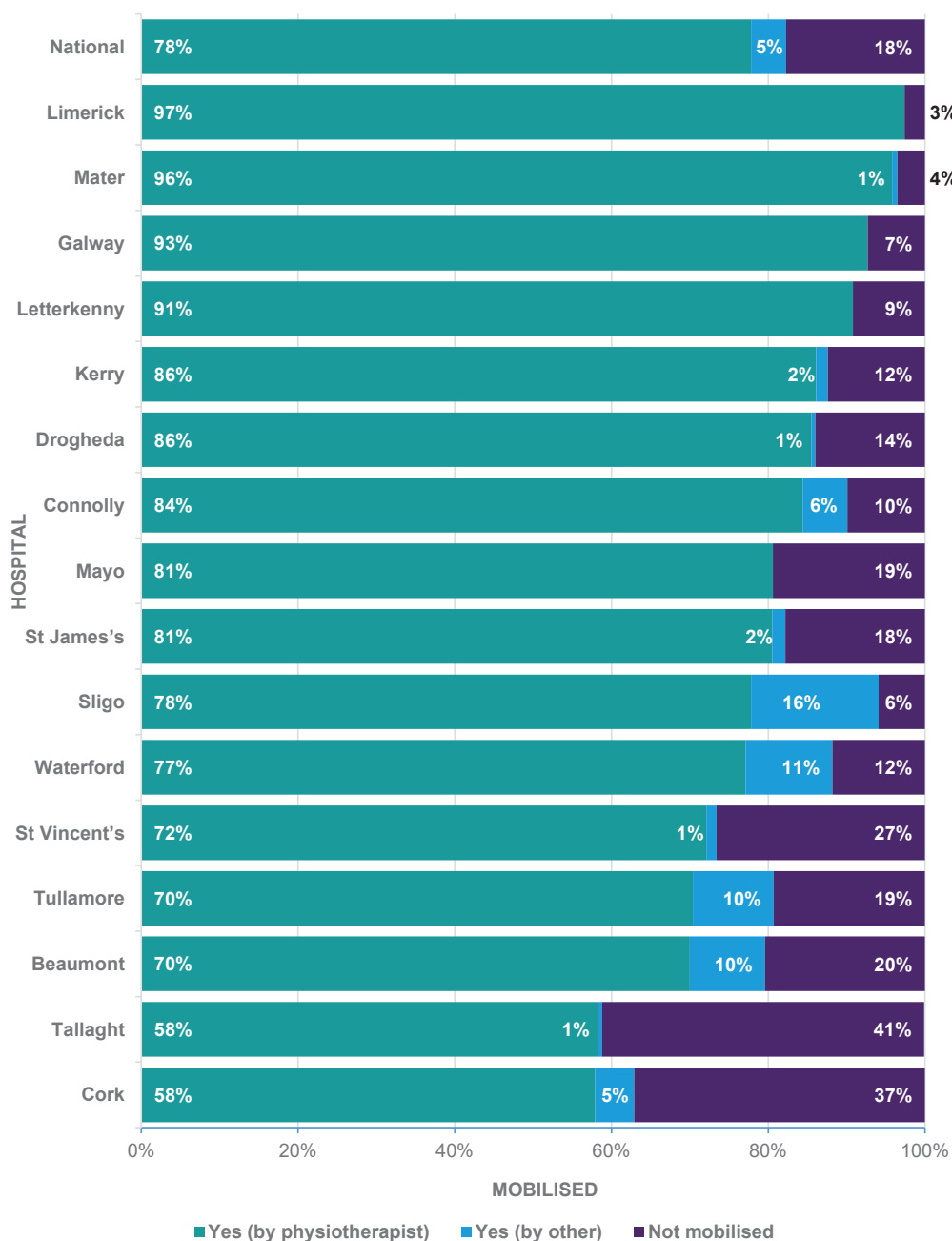


FIGURE 6.8A: PERCENTAGE OF PATIENTS BY MOBILISATION DAY OF OR DAY AFTER SURGERY, BY HOSPITAL (n=3510) ^{26, 27}

²⁶ 165 patients did not have surgery and 26 patients who had 'not known' recorded have been excluded from analysis.

²⁷ Please note percentages may not sum to 100% due to rounding.

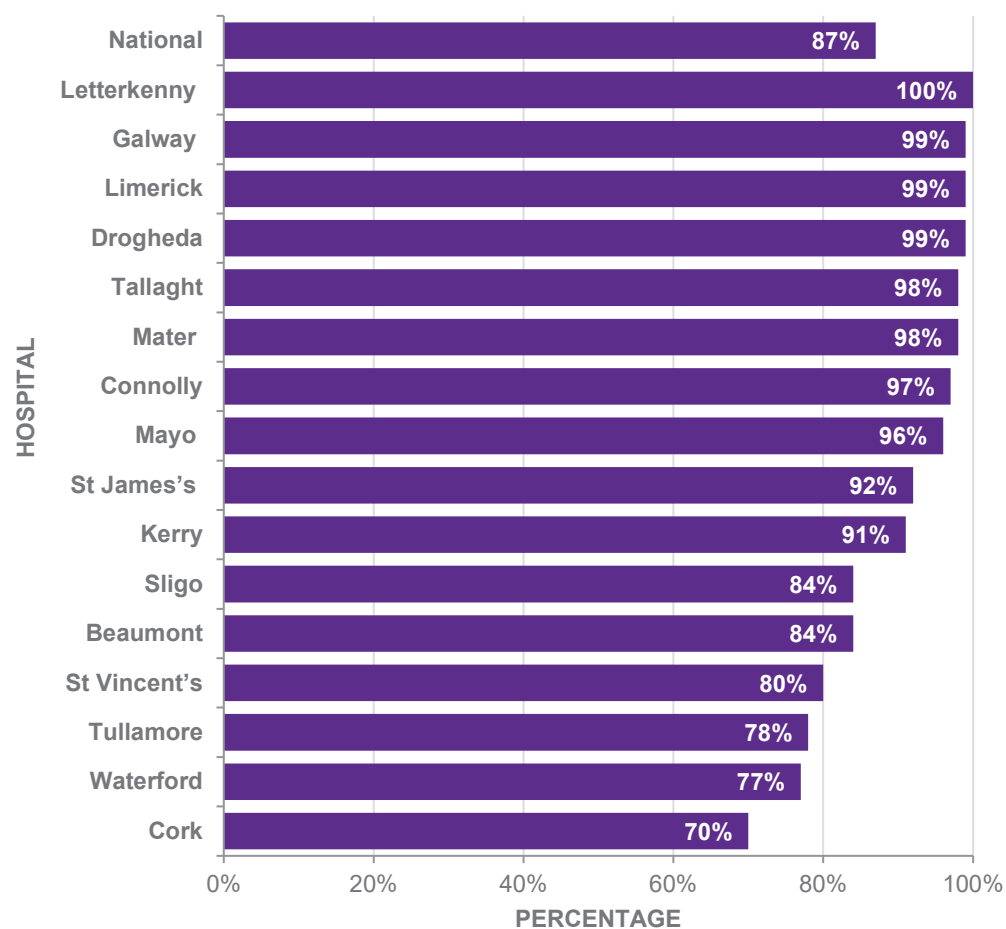
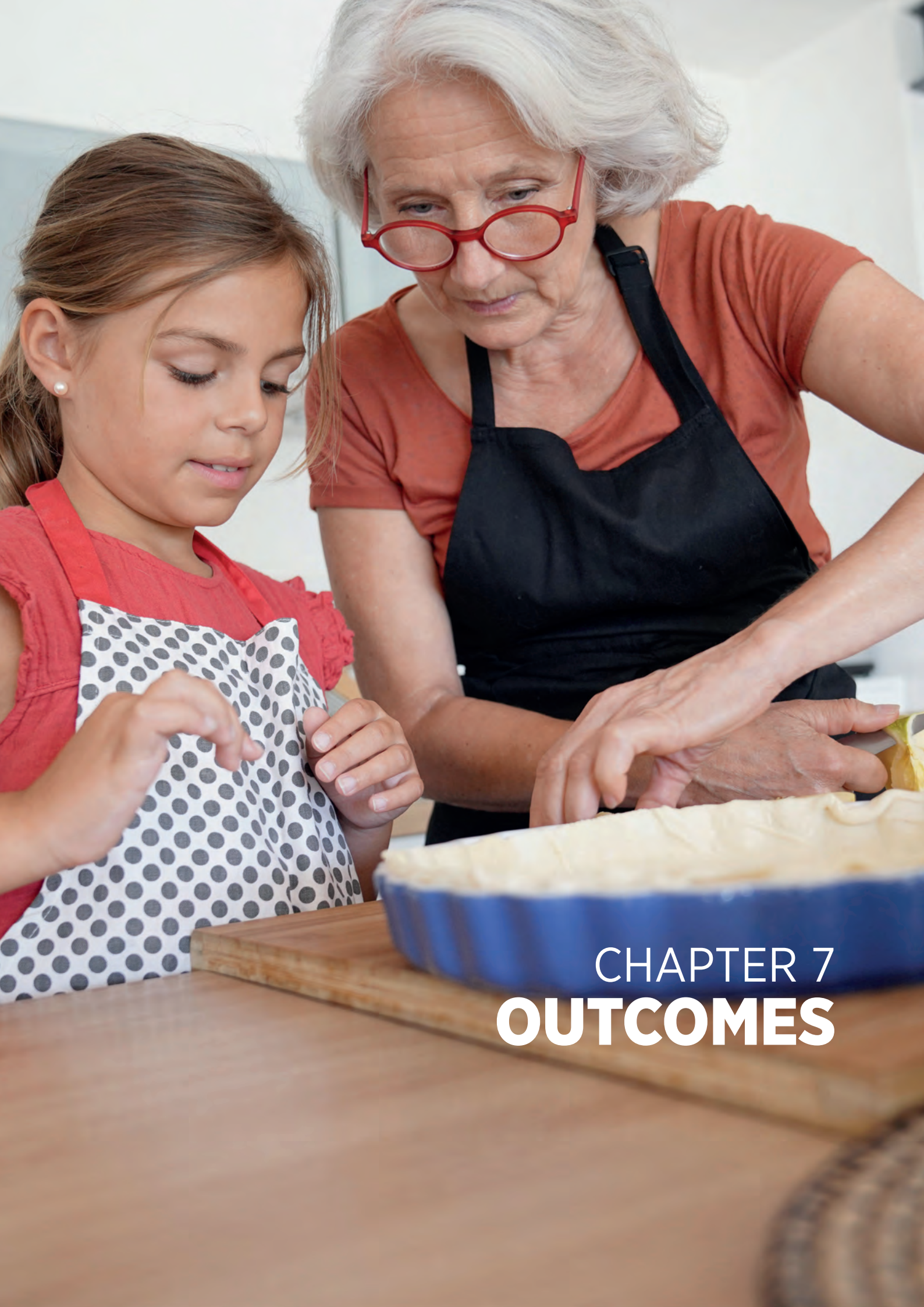


FIGURE 6.8B: PERCENTAGE OF PATIENTS WHO WERE ASSESSED BY A PHYSIOTHERAPIST ON THE DAY OF OR DAY AFTER SURGERY, BY HOSPITAL (n=3536)²⁸

²⁸ 165 patients did not have surgery and have been excluded from analysis.

KEY FINDINGS FROM CHAPTER 6

- Ninety-three percent (n=3435) of patients presented directly to an ED in an operating hospital.
- Seventy-six percent (n=2700) of patients received their surgery within 48 hours. This is an increase of four percentage points from 2018.
- Sixty percent of patients received a nerve block pre-operatively. The use of pre-operative nerve blocks ranged from 10% to 95% at hospital level.
- Fifty percent of patients had no documented nutritional risk assessment.
- Seventy-six percent of arthroplasties reported in 2019 were cemented (n=1399), which was a slight increase over 2018. However, there is a large variation in the use of bone cement at hospital level.
- Eighty-two percent (n=2889) of patients were mobilised on the day of or the day after surgery, and 87% were assessed by a physiotherapist on the day of or the day after surgery. Both variables have increased by five percentage points from 2018.



CHAPTER 7 **OUTCOMES**

CHAPTER 7: OUTCOMES

FUNCTIONAL OUTCOMES: CUMULATIVE AMBULATORY SCORE

Functional outcomes, measured by the Cumulative Ambulatory Score (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 hip fracture management 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 32% (n=1114) of patients, while data for the day of discharge were missing for 43% (n=1518) 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 their day of discharge were included (n=1931).

Figure 7.1 shows that 23% (n=453) 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. This represents an improvement of five percentage points from 2018.

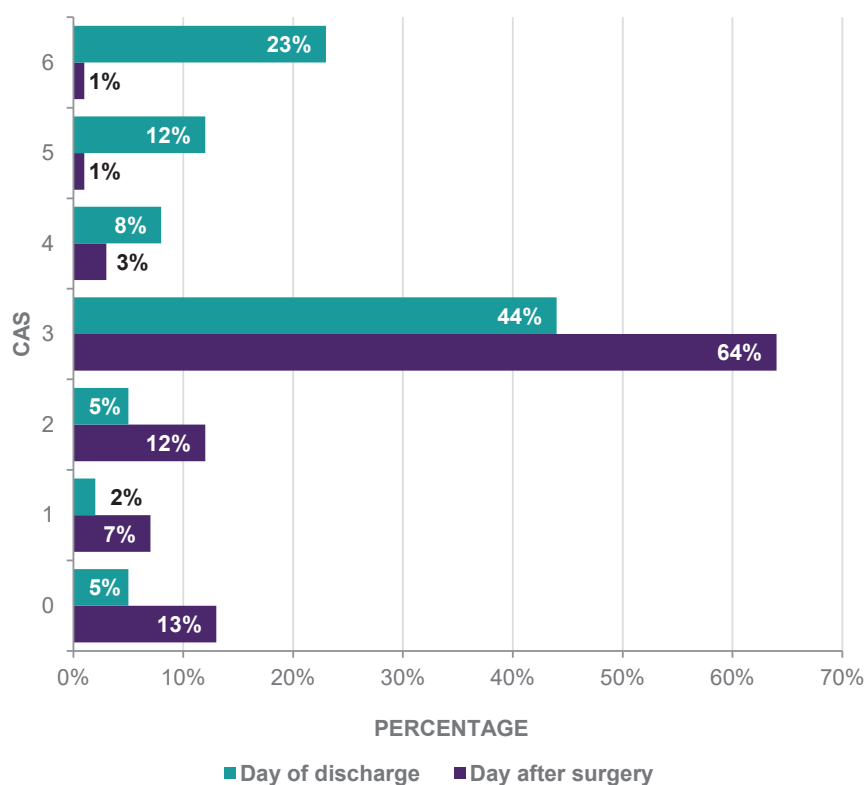


FIGURE 7.1: PERCENTAGE OF PATIENTS BY FUNCTIONAL OUTCOMES: CAS (n=1931)²⁹

²⁹ Percentages may not sum to 100% due to rounding.

DESTINATION ON DISCHARGE

Figure 7.2 shows that 24% (n=885) of patients were discharged directly home from hospital, which represents an improvement of four percentage points from 2018; a further 31% (n=1162) required rehabilitation either at an on-site or off-site facility. Thirteen percent (n=469) required convalescent care, while 4% (n=158) of patients were recorded as new admissions to a nursing home or long-stay care facility; this represents a reduction of two percentage points from 2018.

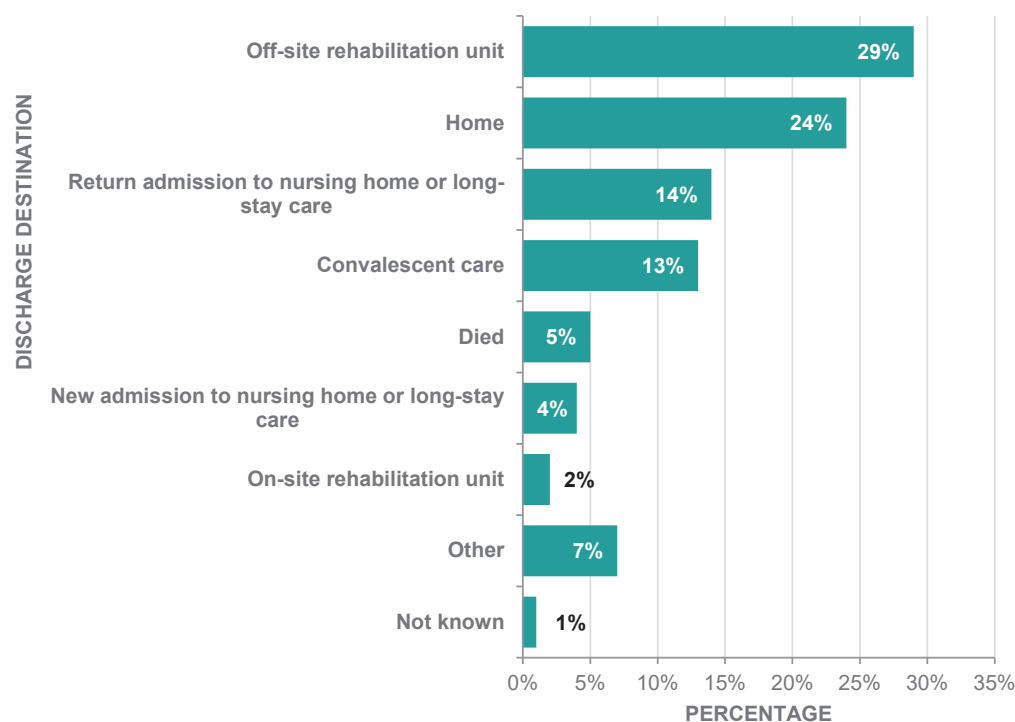


FIGURE 7.2: PERCENTAGE OF PATIENTS BY DESTINATION ON DISCHARGE (N=3701)

CUMULATIVE LENGTH OF STAY

In 2019, the number of acute hospital bed days occupied by hip fracture patients was 72,314. 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 LOS of all patients; 25% of patients were discharged within 1 week, and 60% within a fortnight. The mean LOS for hip fracture patients was 19.5 days, which is a slight increase from the 18.7 days reported in 2018. The median LOS remained constant at 12 days, which is the same as that reported in 2018. When compared with a mean LOS of 15.5 days in the UK, 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, through the initiation of a home safety checklist and community falls prevention programmes, harmful falls at home that lead to hip fractures can be prevented. 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.

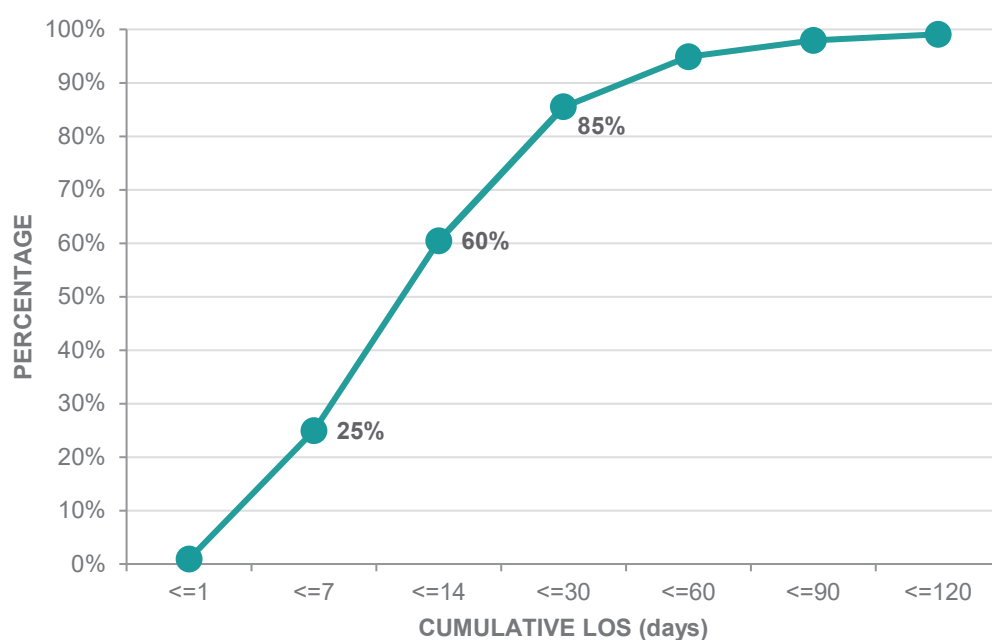


FIGURE 7.3: PERCENTAGE OF PATIENTS BY CUMULATIVE LOS (N=3701)

RE-OPERATION WITHIN 30 DAYS

Reoperation acts as a marker of the quality of care. Figure 7.4 shows that 86% (n=3058) of patients were not reoperated on within 30 days. However, a large proportion of data was missing or not documented for this field (12%, n=419).

NOCA is working with IHFD audit coordinators to improve the coding of this question and towards collecting longer-term outcome measures. A grant application has been made to carry out research into the methods for collecting longer-term data in this patient group. In 2020, the IHFD follow-up data portal will be updated to allow for the collection of information on residential status, New Mobility Score (NMS), pain, readmission details, reoperation, bone protection status, and the quality of life (EQ-5D-5L) at 30, 120 and 365 days.

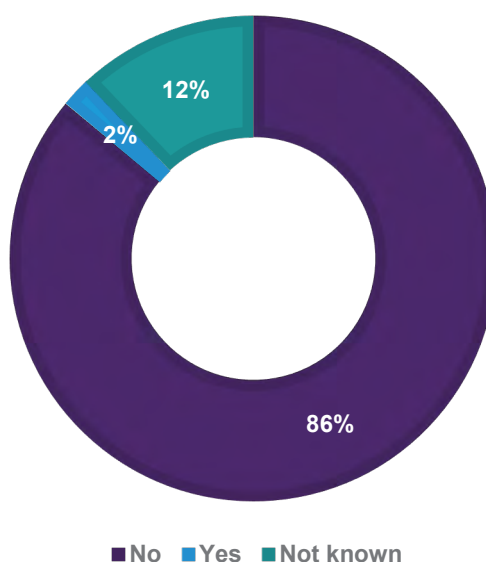


FIGURE 7.4: PERCENTAGE OF PATIENTS BY RE-OPERATION WITHIN 30 DAYS (n=3536)³⁰

³⁰ Percentages may not sum to 100% due to rounding.

KEY FINDINGS FROM CHAPTER 7

- Twenty-three percent (n=453) of patients achieved a maximum CAS of 6, thus indicating independent mobility on discharge from the acute hospital. This represents an improvement of five percentage point from 2018. The data completeness for the CAS must be improved for both Day 1 post-surgery and for the day of hospital discharge.
- Twenty-four percent (n=885) of patients were discharged directly home from hospital, which represents an improvement of four percentage points from 2018. A further 31% (n=1162) required rehabilitation either at an on-site or off-site facility.
- Four percent (n=158) of patients were admitted to long-term care as a new admission, which represents a reduction of two percentage points from 2018.
- The mean LOS for hip fracture patients was 19.5 days, which represents a slight increase from the 18.7 days reported in 2018. The median LOS remained constant at 12 days, which is the same as that reported in 2018.
- One-quarter of patients were discharged from the acute hospital within 1 week.

CHAPTER 8 AUDIT UPDATE



CHAPTER 8: AUDIT UPDATE

UPDATE ON AUDIT RECOMMENDATIONS FROM 2018

Recommendations from the HSE	Update
Ensure that each hospital has a hip fracture governance committee (HFGC) operationalised.	Regular updates were sought throughout the year from the audit coordinators and clinical leads regarding the status of the HFGC meetings. University Hospital Kerry was encouraged and supported throughout 2019 to set up a HFGC and has agreed to operationalise this in 2020.
Recommendations for managers, clinicians and audit coordinators	Update
Each hospital HFGC will engage in quality improvement, using the quarterly IHFD hospital and BPT reports to increase compliance with the IHFS.	During 2019, NOCA hosted a two-day Foundation Quality Improvement Programme which was provided by the HSE National Quality Improvement Team (QIT). Each hospital participated with a team to gain the same baseline knowledge and tools to perform quality improvement using the data from the IHFD.
Hospital HFGCs will focus on admitting patients to an orthopaedic ward or for surgery within 4 hours of presentation.	IHFS 1 is improving gradually across all hospitals. Many hospitals have implemented alerts with the National Ambulance Service (NAS) and the Dublin Fire Brigade (DFB) if a suspected hip fracture is being brought into the ED to allow hospital staff time to prepare for the reception of these patients.
Hospital HFGCs will continue to develop multidisciplinary orthogeriatric services.	IHFS 4, 5 and 6 have all steadily improved throughout 2019 as orthogeriatric services have developed across Ireland. A number of candidate advanced nurse practitioners (cANPs) for orthogeriatrics, gerontology or orthopaedics with a focus on hip fracture care are now in post as well.
All hospitals will focus on increasing the number of patients assessed and mobilised by a physiotherapist on Day 1 after their surgery.	In 2019, compliance improved further and in 2020 the IHFD is introducing a new standard (IHFS 7) measuring the percentage of patients mobilised on the day of or after surgery by a physiotherapist.
All healthcare staff should promote a culture of activity and functional independence among hip fracture patients and their carers.	In 2019, the percentage of patients mobilised early increased, and it is anticipated that the creation of a new IHFS will drive further improvement in 2020.
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.	This report shows that in 2019, more patients went home directly and fewer patients were newly admitted into long-term care.

The Irish Institute for Trauma and Orthopaedic Surgery (IITOS) will review the level of variation in types of implants, including cemented/uncemented prostheses and total hip replacements (THRs) being undertaken in the hip fracture population.	At the IHFD workshop and conference in 2019, the new implant list was presented, and the pilot of the dataset is underway and is expected to be available nationally during 2020. This will facilitate detailed research into hip fracture implants.
Hospitals will submit data in a timely manner to achieve 90% data coverage quarterly and annually.	Every hospital achieved in excess of 90% data coverage during 2019.
Recommendations for NOCA	Update
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.	This focus on “Right care, Right place, Right time, Right team” throughout 2019 has borne fruit, with improvements noted in all IHFS and many other aspects of the data and care.
NOCA will build robust data validation reports and provide improved quarterly reports for the IHFD to the participating hospitals.	In 2019, the data validation reports (DVRs) were developed by the data analytics team and the IHFD Audit Manager in NOCA and, following a pilot, were implemented fully for the 2019 data.
NOCA will continue to progress the development of long-term outcome measures for the IHFD.	The IHFD has been granted access to use the EQ-5D-5L and a research grant application has been made to test methods for follow-up data collection in 2020.
NOCA should increase the level of patient and public involvement in the development and progress of the IHFD.	NOCA is currently seeking further expressions of interest for a second Public and Patient Interest (PPI) Representative for the IHFD Governance Committee and is pursuing opportunities to engage in PPI involvement.

USE OF NATIONAL IHFD AUDIT INFORMATION

NOCA launched and presented the *Irish Hip Fracture Database National Report 2018* virtually in November 2019 at the National Irish Hip fracture Meeting in the Royal College of Surgeons. The IHFD Clinical Leads, Dr Emer Ahern and Mr Conor Hurson; the IHFD Audit Manager; and members of the IHFD Governance Committee presented the audit findings throughout 2019 at many national and international conferences, including the Fragility Fracture Network (FFN) in Oxford, the International Collaboration of Orthopaedic Nursing Conference in Denmark, the European Public Health Conference in France, the Irish Orthopaedic Association Conference, the Irish Association for Emergency Medicine Annual Scientific Meeting the Healthcare Pricing Office (HPO) Conference, the Irish DXA Society Meeting, the Scottish Hip Fracture Annual Conference, the AFFINITY National Falls and Bone Health Symposium 2019, Cork University Hospital Grand Rounds, QIT falls collaborative, the Hip Fracture Summit, London, and the Irish Gerontological Society Meeting.

Research conducted using the IHFD data, entitled 'Early mobilisation reduces the risk of in-hospital mortality following hip fracture', was published in the journal of *European Geriatric Medicine*, Ferris *et al.* 2020. This research was carried out by Dr Helena Ferris, Professor Tara Coughlan and Louise Brent, and has helped demonstrate the need for a new IHFS for early mobilisation for the IHFD. It also signalled the importance of clinical audit data being used for research and led to the formalisation of an IHFD research group. This group will seek ethical approval in 2020 to perform secondary analysis of the IHFD data to determine the impact of hip fracture care standards, the role of system factors, and outcomes following hip fracture in the patient population.

Data were also requested by the HSE National Office for Trauma Services to support the development of *A Trauma System for Ireland: Report of the Trauma Steering Group* (Department of Health, 2018). These data will be used for capacity planning, bypass, pathway development, and service evaluation, and cement the value of these data for supporting the wider health system.

The success of the implementation of the BPT for hip fracture has become a potential model for improving the quality of care for patients with other conditions. The increase in the number of hospitals achieving the BPT and the increase in monies obtained by hospitals has been reassuring for the hospitals and the IHFD. It also adds recognition to the hard work being done by all of the hospitals for hip fracture patients.

TRAINING

In 2019, training was provided at the IHFD audit coordinator workshop in May. This was delivered in the Royal College of Surgeons in Ireland (RCSI) with presentations from Louise Brent, IHFD Audit Manager; Phil Dunne, HPO; Pamela Hickey, Clinical Nurse Manager 2, University Hospital Limerick; Dr Mary Browne and Veronica Hanlon, HSE National QIT; Mr Terence Murphy, Orthopaedic Consultant, University Hospital Waterford; and Dr Sudhir Immani, Consultant Anaesthetist, University Hospital Waterford. Topics this workshop focused on included data quality, quality improvement, hip fracture implants, and management of anticoagulants in hip fracture patients. The workshop also included a two-hour co-design workshop with the HSE Quality Improvement Division team, focusing on the development of a programme of quality improvement for the hospitals participating in the IHFD.



IHFD Workshop 2019

The Foundation Programme for QI was developed following the workshop, the impetus for which was highlighted at the Irish Hip Fracture Meeting in November 2018, where each of the hospitals participating in the IHFD presented their local projects to improve the care of hip fracture patients. The presentations were well received and the shared learning from each hospital was extremely valuable. Two things became apparent from the presentations: first, that there is a huge amount of great work being done in all of the hospitals, and second, that there was a need to improve the level of knowledge and understanding of quality improvement methodologies. Following the conference, Dr Philip Crowley, National Director of the HSE National QIT, suggested that the IHFD should work with his team to develop a collaborative programme tailored to the needs of the hospitals involved in the audit.

The first steps towards this were taken in May 2019 at a co-design workshop for the IHFD audit coordinators. Each hospital was then invited to attend the programme with a team of three people. The first day of the programme was held on 30 September 2019, with 14 teams present. The programme was hosted by the HSE National QIT – Dr Mary Browne, Veronica Hanlon and Lisa Toland – and was well attended by a multidisciplinary audience including orthopaedic surgeons, geriatricians, nurses, health and social care professionals (HSCPs), and hospital managers. The first day focused on the first three pillars in the Framework for Improving Quality: Measurement for Quality, Use of Improvement Methods, and Staff Engagement. The second day was held on 28 November 2019, with 13 teams present. This day focused on the other three pillars: Leadership for Quality, Person and Family Engagement, and Governance for Quality. Maureen Flynn led the session on leadership.

There was an electric atmosphere in the room throughout both days, with a lot of laughter and energy as the teams worked together to problem-solve, improve, and share common learnings. The Mr Potato Head challenge created a streak of competitiveness between the IHFD Clinical Leads, Dr Emer Ahern and Mr Conor Hurson, like nothing ever witnessed before!

Programme Leader Dr Mary Browne said, “Great to see such active participation with the QI Foundation Programme. Many disciplines working together to improve the care they are providing to people with hip fractures.”



From left to right: Dr Mary Browne, Specialist in Public Health Medicine, School of QI, National Quality Improvement Team, Veronica Hanlon, School of QI, National Quality Improvement Team, Lisa Toland, QI Facilitator, National Quality Improvement Team



IHFD Workshop 2019

AUDIT DEVELOPMENTS

In 2019, the reporting from the IHFD was enhanced with the creation of new quarterly reports by the NOCA data analytics team. These reports are being utilised to support the IHFD Governance Committee meetings and to monitor improvement. Feedback from the hospitals about the new reports has been very positive.

In addition to the quarterly reports for the IHFS and BPT, the NOCA data analytics team also created DVRs which can be sent out quarterly in order to ensure the data are fully validated and to improve the data quality.

The IHFD data dictionary was also in development during 2019.

The background of the page is a blurred photograph of a hallway. In the foreground, a person in a blue uniform is walking away from the camera. In the background, another person in a white uniform is walking towards the camera. The hallway has a light-colored floor and walls, and there are bright lights on the ceiling.

CHAPTER 9

RECOMMENDATIONS

CHAPTER 9: RECOMMENDATIONS

RECOMMENDATIONS FOR NOCA

RECOMMENDATION 1

Introduce a new IHFS for early mobilisation – measuring the percentage of patients mobilised by a physiotherapist on the day of or the day after surgery – to quarterly reports in 2020.

Rationale
<ul style="list-style-type: none"> Recent research conducted by Ferris <i>et al.</i> (2020) using IHFD data from 2013 to 2017, and which looked at predictors of in-hospital mortality following hip fractures, identified that early mobilisation was an independent predictor of inpatient mortality and the only modifiable factor resulting from the research. Other hip fracture registers, including the UK's National Hip Fracture Database (NHFD), the Scottish Hip Fracture Audit (SHFA) and the Australian & New Zealand Hip Fracture Registry (ANZHF), have all introduced this as a hip fracture standard in recent years.
What action should be taken?
<ul style="list-style-type: none"> NOCA will introduce the new standard to the clinical leads, audit coordinators, hospitals and hospital managers in 2019. The quarterly hospital reports will be amended for Q1 2020 to start reporting the hospitals' compliance with this standard back to the hospitals. The HSCP lead for the IHFD will communicate with physiotherapy colleagues directly about the new IHFS. The reason for not mobilising a patient on the day of or the day after surgery will be added to the dataset from 2020.
Who will benefit from this action/recommendation?
<ul style="list-style-type: none"> Hip fracture patients will receive more timely and appropriate treatment, leading to reduced inpatient mortality. Earlier mobilisation should lead to fewer postoperative complications, such as pressure injuries, chest infections and constipation, and more patients may be able to be discharged directly home. This is the first IHFS that HSCP staff will be directly responsible for, raising the importance of their input into the care of hip fracture patients.
Who is responsible for implementing this action/recommendation?
<ul style="list-style-type: none"> NOCA is responsible for informing the clinical leads, audit coordinators, hospitals and hospital managers about the new IHFS. The IHFD HSCP representative is responsible for informing all physiotherapists working in the 16 participating hospital about the new standard.
When will this be implemented?
NOCA informed the hospitals in Q4 2019 about the introduction of the new IHFS.

RECOMMENDATION 2

Develop workshops to create a learning culture for quality improvement with the clinical leads and audit coordinators of the IHFD.

Rationale
<ul style="list-style-type: none"> In the <i>Irish Hip Fracture Database National Report 2018</i>, each hospital highlighted its quality improvement projects and presented these at the Irish Hip Fracture Meeting.
<ul style="list-style-type: none"> The meeting feedback highlighted how hugely beneficial these presentations were for all of the hospitals.
<ul style="list-style-type: none"> Dr Philip Crowley suggested that the HSE National QIT could help build on this work with the IHFD by developing a Foundation Programme for Quality Improvement specifically for the IHFD.
<ul style="list-style-type: none"> In 2019, a co-design workshop was held with the IHFD, and again feedback was extremely positive that this work would help hospitals improve.
<ul style="list-style-type: none"> A two-day Foundation Programme for Quality Improvement was then held in Q3 and Q4 2019 with teams from participating hospital. Feedback again indicated how beneficial this was for hospitals.
What action should be taken?
<ul style="list-style-type: none"> NOCA will continue to support and work with hospitals to deliver quality improvement for hip fracture patients by holding regular workshops with the clinical leads and audit coordinators.
<ul style="list-style-type: none"> Feedback from the Foundation Programme for Quality Improvement indicated that the clinical leads and audit coordinators would like ongoing support to champion quality improvement in their hospitals and that ongoing workshops would be very beneficial.
Who will benefit from this action/recommendation?
<ul style="list-style-type: none"> Hip fracture patients will benefit from refined clinical pathways, better resourcing, and improved teamwork brought about by quality improvement in each hospital.
<ul style="list-style-type: none"> Hospitals will work more efficiently due to improved quality of care for hip fracture patients.
<ul style="list-style-type: none"> The multidisciplinary teams in each hospital will work more cohesively towards target improvements for hip fracture patients.
Who is responsible for implementing this action/recommendation?
<ul style="list-style-type: none"> NOCA will coordinate and organise the Foundation Programme for Quality Improvement throughout the year.
When will this be implemented?
<p>This will be implemented throughout 2020.</p>

RECOMMENDATION 3

Support hospitals to attain high levels of data coverage and quality until at least 2022, as they recover from COVID-19.

Rationale
<ul style="list-style-type: none"> The data collection for one calendar year does not usually finish until the end of Q1 (31 March) of the following year. In 2020, the impact from the global COVID-19 pandemic caused significant disruption to the healthcare system, particularly during March. During this period, many IHFD audit coordinators were redeployed to frontline services and away from audit work, thus impacting their ability to input and validate data. <p>As a result, the HPO kept the 2019 Hospital In-Patient Enquiry (HIPE) data file open for an extended period until the end of April 2020.</p>
What action should be taken?
<ul style="list-style-type: none"> NOCA will continue to evaluate this impact and develop new ways of working to best support the 16 participating hospitals and ensure that timely data reporting continues. Due to the evolving nature of the COVID-19 pandemic, there have been significant and long-lasting impacts on Ireland's hospitals and how they contribute to clinical audits such as the IHFD.
Who will benefit from this action/recommendation?
<ul style="list-style-type: none"> NOCA will benefit by developing new ways of working with hospitals virtually.
<ul style="list-style-type: none"> Hospitals will benefit from access to supporting materials, augmented data collection calendars, and training materials for audit collection during this time.
<ul style="list-style-type: none"> The healthcare system will benefit from updates related to care, data quality, and outcomes due to the pandemic.
Who is responsible for implementing this action/recommendation?
<ul style="list-style-type: none"> NOCA is responsible for evaluating and developing novel ways to ensure that clinical audit continues during difficult circumstances in order to help the healthcare system understand how care has been impacted.
When will this be implemented?
<p>This will be continuously implemented evaluated throughout 2020.</p>

RECOMMENDATION 4

Implement processes for the introduction of long-term outcome measures in the IHFD.

Rationale
<ul style="list-style-type: none"> The IHFD only collects data during patients' in-hospital acute episode of care. <p>Long-term outcome measures can inform how healthcare services and interventions have, over time, affected patients' quality of life, daily functioning, symptom severity, survival, and residence, as well as the patients' point of view, therefore informing healthcare services whether healthcare interventions actually make a difference to people's lives (Williams <i>et al.</i>, 2016).</p>
What action should be taken?
<ul style="list-style-type: none"> The HIPE IHFD follow-on portal will be activated for use across all hospitals, with outcome measures linked to the best evidence available including residential status, New Mobility Score (NMS), pain, reoperation and readmission details, bone protection status, and quality of life (EQ-5D-5L) at 30, 120 and 365 days. Research funding will be sought to conduct meaningful research into how best to collect long-term outcome measures for hip fracture patients.
Who will benefit from this action/recommendation?
<ul style="list-style-type: none"> NOCA will be able to provide long-term outcome data for reporting. Clinicians and healthcare workers will better understand the impact of hip fracture care and outcomes in the longer term, and will be able to evaluate care pathways. Patients will be able to provide feedback and contribute to the audit.
Who is responsible for implementing this action/recommendation?
<ul style="list-style-type: none"> NOCA will oversee the activation of the HIPE IHFD follow-on portal with the HPO. The IHFD Governance Committee will work towards getting funding for research into long-term outcomes.
When will this be implemented?
<p>The activation of the HIPE IHFD follow-on portal and the research funding application will be done during 2020. The research will take place post-funding, from 2021 onwards.</p>

RECOMMENDATION 5

Develop a research group for the IHFD, including Public and Patient Interest (PPI) representatives.

Rationale
<ul style="list-style-type: none"> The IHFD Governance Committee should set up a formal research group for the audit, as the maturity of the audit and data will now allow meaningful research to be conducted. The benefit of using the data for research is apparent from recent publications by Ferris <i>et al.</i> (2020) and Hughes <i>et al.</i> (2019).
What action should be taken?
<ul style="list-style-type: none"> The IHFD Governance Committee will agree on a subgroup of the committee and extended membership of a research group for the IHFD. NOCA will extend invitations and coordinate the establishment of a research group for the IHFD.
Who will benefit from this action/recommendation?
<ul style="list-style-type: none"> NOCA will enhance its audit portfolio with high-quality research outputs. The IHFD will benefit from the findings of this research, and this may shape and inform future amendments to the data or inform hospitals about changes to processes of care.
Who is responsible for implementing this action/recommendation?
<ul style="list-style-type: none"> The IHFD Audit Manager will coordinate the development of the IHFD research group.
When will this be implemented?
<p>This was discussed at the final IHFD Governance Committee meeting for 2019 and will be commenced in Q1 2020.</p>

RECOMMENDATION 6

Conduct an organisational audit to look at resources, governance and quality improvement at hospital level in 2020.

Rationale
<ul style="list-style-type: none"> In the <i>Irish Hip Fracture Database National Report 2016</i>, a facilities audit was undertaken in order to quantify the resources and services provided in each of the hospitals, as that year the national report introduced hospital-level reporting. This was an attempt to explain some of the variation in care and in IHFS compliance across hospitals.
<ul style="list-style-type: none"> In the <i>Irish Hip Fracture Database National Report 2017</i>, a governance audit was undertaken in order to establish the local hip fracture governance structure in each hospital. This was done to develop guidance for HFGCs.
<ul style="list-style-type: none"> In 2018, the requirement for each hospital to have a HFGC became part of the BPT.
<ul style="list-style-type: none"> Due to the progress with the BPT and the changes in the IHFS since 2016, it is important to provide this information to the hospitals so that we can not only verify HFGC activity, but also measure the change in resources directly related to improvements in care over time. Hip fracture organisational audits are also undertaken in other registers, such as the UK's NHFD and the ANZHFR.
What action should be taken?
<ul style="list-style-type: none"> The IHFD Governance Committee will update previous facility and governance audits and add any additional questions that may be more relevant to the audit now.
Who will benefit from this action/recommendation?
<ul style="list-style-type: none"> Hospitals will be able to understand how resources may impact their compliance with the IHFS.
<ul style="list-style-type: none"> NOCA will be able to report this information as part of the audit in order to give an enhanced understanding about hip fracture care at the hospital level.
<ul style="list-style-type: none"> The HSE's National Office for Trauma Services will be able to use these data for capacity and service development.
Who is responsible for implementing this action/recommendation?
<ul style="list-style-type: none"> NOCA will develop this organisational audit and circulate it to the hospitals.
When will this be implemented?
<p>This will be developed in Q1 2020 and disseminated to the hospitals in Q2 2020. The results will be reported in the <i>Irish Hip Fracture Database National Report 2020</i>, to be published in 2021.</p>

RECOMMENDATION 7

Increase engagement with PPI representatives to:

- **raise awareness of topics such as falls prevention and frailty**
- **create information resources for patients about what to expect while in hospital, on discharge, and for rehabilitation**
- **create opportunities for multistakeholder engagement around key issues faced by patients**

Rationale
<ul style="list-style-type: none"> • In line with NOCA's guidance for IHFD Governance Committee membership, it is essential that PPI representative involvement is included at every level of the audit. This will bring an enhanced understanding about what is important to patients and the public, and ensure that key findings from the audit are meaningful to patients and the public and are disseminated widely.
What action should be taken?
<ul style="list-style-type: none"> • A second PPI representative should be recruited to the IHFD Governance Committee. • Opportunities for PPI representative involvement in the IHFD should be actioned throughout the year, e.g. at the IHFD workshop and the Irish Hip Fracture Meeting as a research committee member, as a member of the IHFD report writing group, and in the development of patient information resources and media campaigns.
Who will benefit from this action/recommendation?
<ul style="list-style-type: none"> • NOCA will benefit from the PPI representative's perspective regarding how IHFD information can be disseminated to the patient and public audience. • Patients and the public will be provided with information from the audit that is meaningful to them and which could ultimately help prevent harmful falls leading to hip fracture.
Who is responsible for implementing this action/recommendation?
<ul style="list-style-type: none"> • NOCA is responsible for the recruitment of PPI representatives.
When will this be implemented?
<p>NOCA is constantly looking to expand the number of PPI representatives contributing to audits, and this will continue throughout 2020.</p>

RECOMMENDATIONS FOR THE HEALTH SERVICE EXECUTIVE

RECOMMENDATION 8

The Health Service Executive (HSE), National Office for Trauma Services in collaboration with the Clinical Programme for Trauma and Orthopaedic Surgery, will:

- continue to prioritise and operationalise a national hip fracture bypass for all hospitals
- improve pathways of care for hip fracture through the trauma system, i.e. ED, operating theatre and rehabilitation.

Rationale

- The publication of *A Trauma System for Ireland: Report of the Trauma Steering Group* (Department of Health, 2018) sets out clear guidance for the development of an evolved and efficient trauma system.
- In *A Trauma System for Ireland: Report of the Trauma Steering Group* report, specific reference is made to the need for national bypass and standardised pathways of care for specific groups of trauma patients, including hip fracture patients.
- The Clinical Programme for Trauma and Orthopaedic Surgery has already initiated many of these improvements in recent years and is now a key collaborator for the HSE's National Office for Trauma Services. As evidenced in this report, there are still improvements required in IHFS 1 and 2 and in the rehabilitation and discharge of hip fracture patients.

What action should be taken?

- The Health Service Executive, National Office for Trauma Services in collaboration with the Clinical Programme for Trauma and Orthopaedic Surgery, should use the data from this report to inform bypass protocol and pathways of care throughout the new trauma system for Ireland.

Who will benefit from this action/recommendation?

- Patients will benefit from a more streamlined, efficient and appropriate pathway of care, resulting in more timely interventions and better outcomes.
- The HSE will benefit from a more efficient use of resources bringing the right patient to the right hospitals for the right care at the right time, in line with the Sláintecare Implementation Strategy.

Who is responsible for implementing this action/recommendation?

- The Health Service Executive, National Office for Trauma Services in collaboration with the Clinical Programme for Trauma and Orthopaedic Surgery, are responsible for using the findings from this report to inform the development of the trauma system.

When will this be implemented?

The development of the trauma system is ongoing and may take many years; however, changes to bypass and pathways could be operationalised nationally during 2020 and 2021.

RECOMMENDATIONS FOR HOSPITAL MANAGERS, CLINICIANS AND AUDIT COORDINATORS

RECOMMENDATION 9

Hospital Hip Fracture Governance Committees should follow NOCA's guidance for governance committees and meet quarterly to discuss and prioritise IHFD areas for attention.

Rationale
<ul style="list-style-type: none"> Since 2018, the BPT requires that each hospital should have a HFGC invested in quality improvement. The 2017 IHFD hospital governance audit found that there was variance in the composition and functioning of these HFGCs. Using the methodological approaches for quality improvement from the Foundation Programme for Quality Programme 2019, the hospitals should align their HFGC with the NOCA guidance.
What action should be taken?
<ul style="list-style-type: none"> Chairs of the hospital HFGCs should aspire to meet the guidance criteria for governance issued by NOCA. NOCA should re-audit the current composition and activities of the HFGCs.
Who will benefit from this action/recommendation?
<ul style="list-style-type: none"> Hospitals will strengthen their processes to use clinical audit data from the IHFD to improve care. NOCA will benefit from further compliance with the audit's standards for data quality, care and governance.
Who is responsible for implementing this action/recommendation?
<ul style="list-style-type: none"> Hospital managers and IHFD clinical leads should ensure that the hospital is compliant with the BPT standard for HFGCs.
When will this be implemented?
<p>This is an ongoing process for the improvement of governance at hospital level. In 2020, the organisational audit will highlight further opportunities to improve the guidance document created by NOCA.</p>

RECOMMENDATION 10

Focus on increasing compliance with the IHFS to attain the BPT.

Rationale
<ul style="list-style-type: none"> In order to obtain the BPT, each hip fracture case must meet the six clinical care standards as well as the data quality and governance standards. In the <i>Irish Hip Fracture Database National Report 2019</i>, only 15% of cases met the BPT.
What action should be taken?
<ul style="list-style-type: none"> Hospitals should evaluate which standards they are not meeting and why in order to meet the BPT. This will ensure that patients are getting the highest standard of care. NOCA should continue to enhance the quarterly hospital reports to support hospitals in identifying areas for improvement.
Who will benefit from this action/recommendation?
<ul style="list-style-type: none"> Patients will have better outcomes if they receive the highest standard of care. Hospitals will receive higher amounts of the BPT, giving a financial reward as well as a reputational award for providing a high standard of care. Staff morale will be better if work is rewarded and recognised by this tariff.
Who is responsible for implementing this action/recommendation?
<ul style="list-style-type: none"> Hospital managers and the HFGC are responsible for identifying opportunities for better compliance with the BPT.
When will this be implemented?
<p>This has been an ongoing process introduced in 2018 and gaining momentum through 2019. It is anticipated that many of the additional changes made by the hospitals since 2018 will continue to align patient care with the expected standards.</p>

RECOMMENDATION 11**Develop and resource a multidisciplinary orthogeriatric service.**

Rationale
<ul style="list-style-type: none"> • In 2018 and 2019, the IHFD reports have shown an increase in orthogeriatric input on the basis of an orthogeriatrician reviewing a patient.
<ul style="list-style-type: none"> • An orthogeriatric service incorporates a more multidisciplinary group of healthcare professionals in the care of hip fracture patients.
<ul style="list-style-type: none"> • Thus far, the IHFD has only identified singular inputs from individual specialties, such as geriatrics or orthopaedics.
<ul style="list-style-type: none"> • The need for an accepted definition of what an orthogeriatric service should consist of and should do needs to be further explained in the audit.
What action should be taken?
<ul style="list-style-type: none"> • The IHFD Governance Committee should include questions about the composition and model of current orthogeriatric services and develop a consensus for updating IHFS 4.
<ul style="list-style-type: none"> • This consensus definition should be discussed and agreed at an IHFD workshop for the IHFD clinical leads before implementation.
Who will benefit from this action/recommendation?
<ul style="list-style-type: none"> • Hospitals will be providing a more cohesive and integrated orthogeriatric service that will benefit the multidisciplinary team.
<ul style="list-style-type: none"> • Patients will have better outcomes if they are treated in a much more coordinated and holistic manner.
Who is responsible for implementing this action/recommendation?
<ul style="list-style-type: none"> • The IHFD Governance Committee will review the organisational audit and develop a consensus definition for review by the IHFD clinical leads.
When will this be implemented?
<p>This will be implemented throughout Q3 and Q4 2020, following the completion of the IHFD organisational audit.</p>

RECOMMENDATION 12

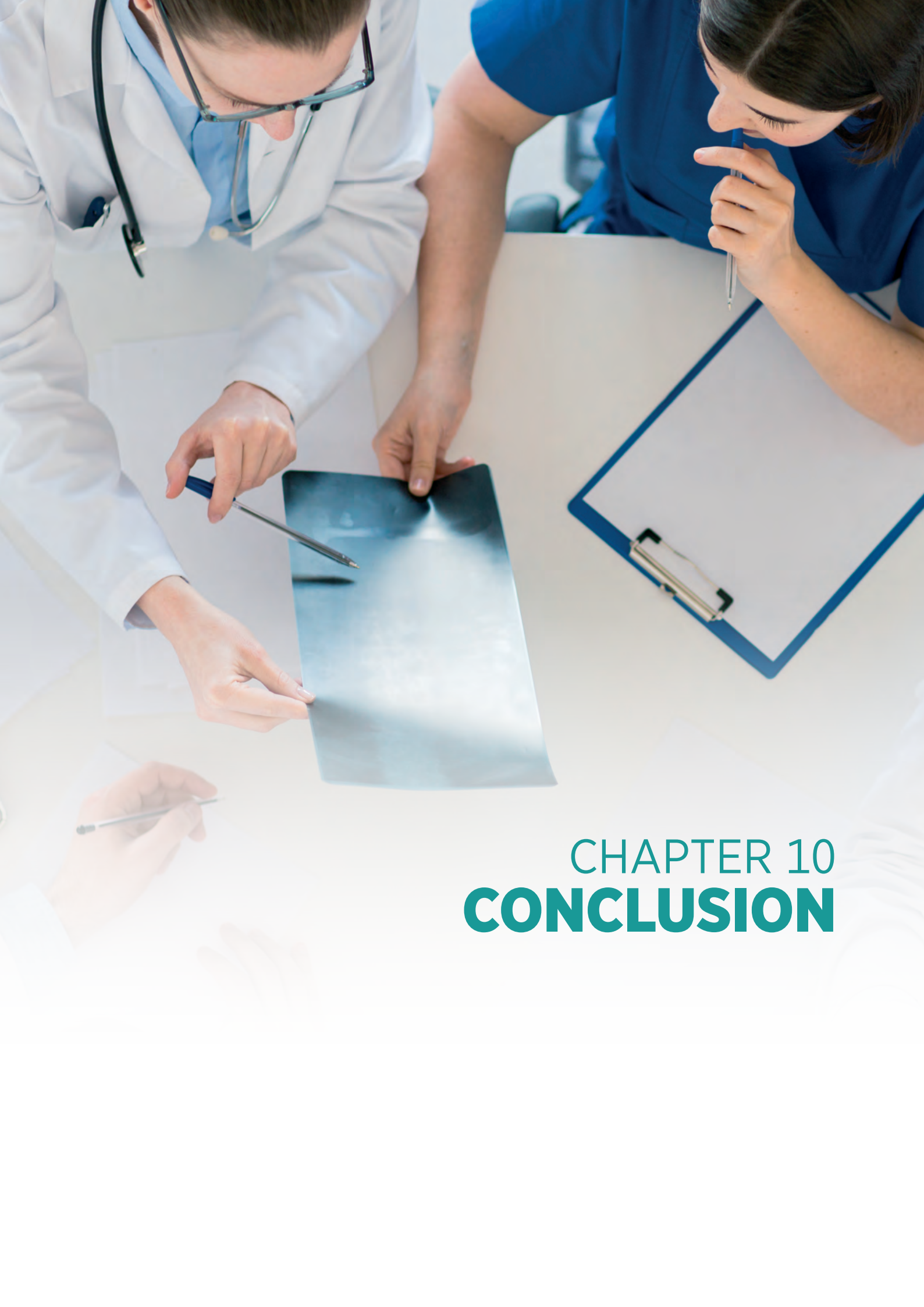
Comply with the new IHFS for early mobilisation, which will measure the percentage of patients mobilised by a physiotherapist on the day of or the day after surgery.

Rationale
<ul style="list-style-type: none"> Recent research conducted by Ferris <i>et al.</i> (2020) using IHFD data from 2013 to 2017, which looked at predictors of in-hospital mortality following hip fractures, identified that early mobilisation was an independent predictor of inpatient mortality and the only modifiable factor resulting from the research. Other hip fracture registers, including the UK's NHFD, the SHFA, and the ANZHFR, have all introduced this as a hip fracture standard in recent years.
What action should be taken?
<ul style="list-style-type: none"> Hospitals will focus on their compliance with this new standard from 1 January 2020. Hospitals and HFGCs should review and discuss the new standard at quarterly meetings and review the reasons why patients were not mobilised in order to identify opportunities for improvement.
Who will benefit from this action/recommendation?
<ul style="list-style-type: none"> Hip fracture patients will receive a more timely and appropriate treatment, leading to reduced inpatient mortality. Earlier mobilisations will lead to fewer postoperative complications, such as pressure injuries, chest infections, and constipation, and more patients may be able to be discharged directly home. HSCP staff will have greater information about the impact of their interventions on hip fracture patients through this new standard.
Who is responsible for implementing this action/recommendation?
<ul style="list-style-type: none"> NOCA is responsible for informing the clinical leads, audit coordinators, hospitals and hospitals managers about the new IHFS. The HSCP lead on the HFGC should lead the review of compliance with this standard and review current practices.
When will this be implemented?
The new standard will be reported on from 1 January 2020.

RECOMMENDATION 13

Prioritise the discharge of patients directly home from hospital where possible.

Rationale
<ul style="list-style-type: none"> The <i>Irish Hip Fracture Database National Report 2019</i> shows that slightly more patients were discharged directly home in 2019 than in 2018.
<ul style="list-style-type: none"> Overall, the number of patients being discharged directly home remains low, with fewer than one in four patients going directly home.
What action should be taken?
<ul style="list-style-type: none"> Hospitals will focus on the percentage of patients being discharged directly home from hospital following a hip fracture.
<ul style="list-style-type: none"> Where appropriate, hip fracture patients should be identified early following admission and informed that the discharge plan is for them to go directly home (Fitzgerald <i>et al.</i>, 2018).
<ul style="list-style-type: none"> The orthogeriatric team should plan this discharge with the patient, carers and family as early as possible following admission.
Who will benefit from this action/recommendation?
<ul style="list-style-type: none"> Patients will benefit in terms of resuming normal activities, comforts and social activities at home, leading to a better overall quality of life.
<ul style="list-style-type: none"> Hospitals will improve the length of stay for patients, be able to increase clinical activity, or have capacity to receive new admissions.
Who is responsible for implementing this action/recommendation?
<ul style="list-style-type: none"> HFGCs should evaluate the discharge pathways currently in place and examine opportunities for improvement.
When will this be implemented?
<p>This has been encouraged in the last two IHFD reports and will be a continued focus for the audit throughout 2020, in line with the focus on not only keeping people safe and active at home, but also on getting them home as soon as possible if they have a hip fracture.</p>



CHAPTER 10

CONCLUSION

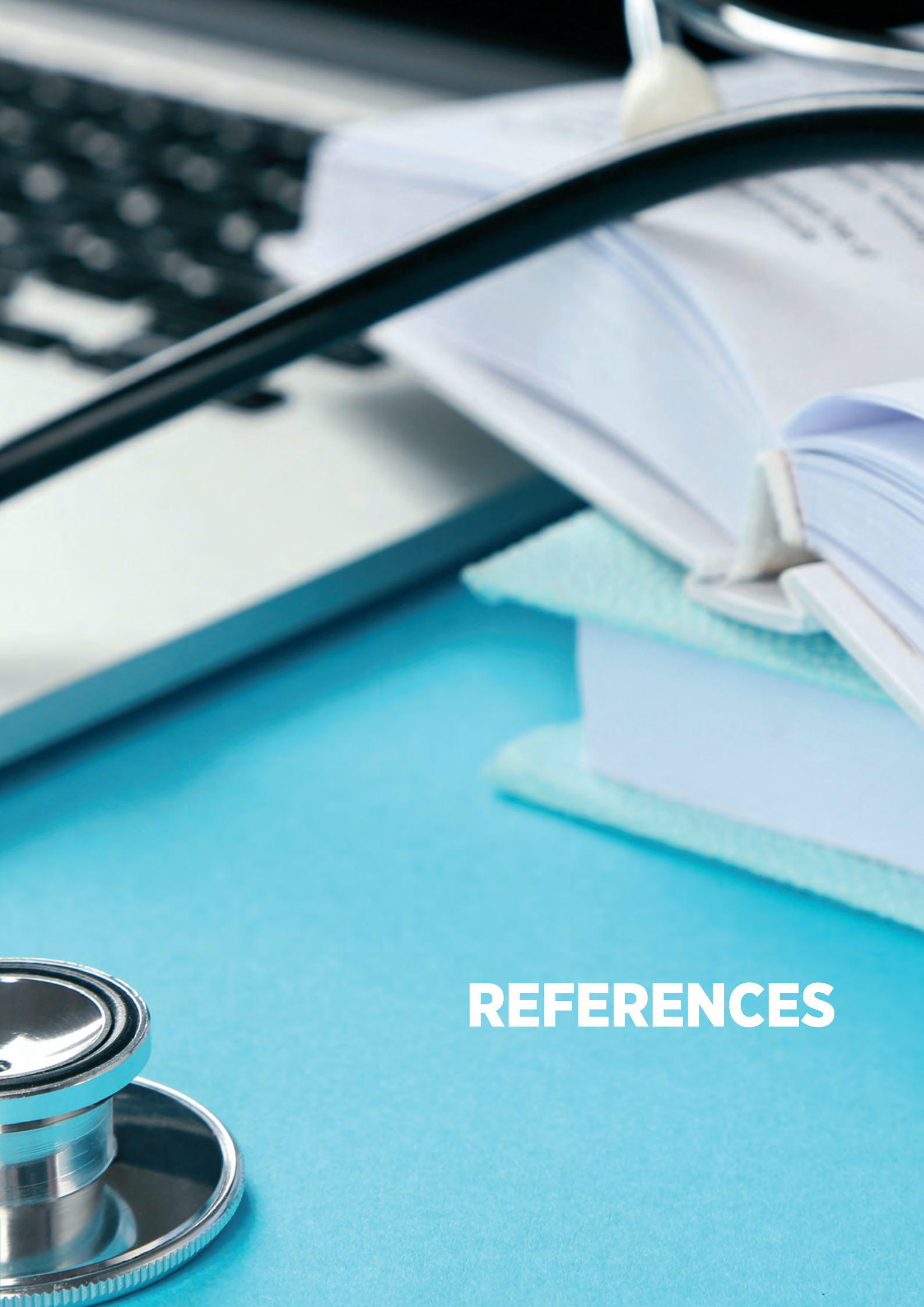
CHAPTER 10: CONCLUSION

This report has reinforced the positive benefit that the IHFD and clinical audit is making in the healthcare system on a local, public, national and system level. The improvement in the IHFS has again reassured the system that the standards being measured are meaningful and lead to improved patient outcomes, with more patients going directly home and having improved function at discharge, and fewer patients being newly admitted into long-term care.

The buy-in and enthusiasm of healthcare staff and hospital management towards the audit throughout 2019 by supporting the Foundation Programme for Quality Improvement has reinvigorated the audit and raised its priority within the healthcare system. The level of buy-in is also evident because of the use of the data by key groups, such as the HSE, National Office for Trauma Services, Business Intelligence Unit, and HSE for the hip fracture key performance indicator, and the Quality Improvement Team, HSE, as well as in some high-profile publications.

Chapter 8 highlights the great work that has led to many of the audit's recommendations coming to fruition. Thanks to the clinical leadership of our hospital clinical leads, the multidisciplinary team, and the data collection and dedication of our audit coordinators, this audit is leading the way for many other national clinical audits. A special thanks also to Dr Philip Crowley and the HSE National QIT for all of their support and for working so closely with the IHFD to develop the first Foundation Quality Improvement programme for a clinical audit.

The next steps for the IHFD will include the implementation of a new IHFS for early mobilisation, delivering high-quality multidisciplinary research, and further improving on the great progress made throughout 2019.



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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
7A. AMTS	
7B. Delirium assessment 4AT Day 1	
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 4AT 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 Q8A
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

APPENDIX 1: IHFD DATASET

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

Question	Options
11. Pre-op medical assessment	1 Routine by geriatrician 2 Routine by medical physician 6 None 7 Geriatric review following request 8 Medical physician review following request 9 Not documented
11A. Assessed by geriatrician during this acute admission	1 Yes, 2 No, 9 Not documented
11B. Geriatrician assessment date	
11C. Geriatrician assessment time	
11D. Geriatrician grade	1 Consultant 2 SpR 3 Registrar 8 Other 9 Not documented
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 operation. 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
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 SpR 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 SpR 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

APPENDIX 1: IHFD DATASET

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

Question	Options
14K. Physiotherapy assessment on day of or day after surgery	1 Yes 2 No, 9 Not documented
14L. Cumulative Ambulatory Score – day after surgery (0–6)	
14M. Reoperation 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, 2 No, 9 Not documented
17. Specialist falls assessment	0 No, 1 Yes – performed on this admission 2 Yes – awaits further outpatient 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, 2 No, 9 Not documented
19. Multidisciplinary rehabilitation team assessment	1 Yes, 2 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 admission to nursing home or long-stay care 6 Return admission to nursing home or long-stay care 8 Other
21A. Discharged to (please specify)	
22. Is admission data entry complete for this episode?	1 Yes, 2 No

APPENDIX 2: IHFD FREQUENTLY ASKED QUESTIONS

Question	Answer
What does IHFD stand for?	Irish Hip Fracture Database
Who are the members of the IHFD Governance Committee?	Mr Conor Hurson, IHFD Clinical Orthopaedic Lead, Dr Emer Ahern, IHFD Clinical Geriatrician Lead Louise Brent, IHFD Audit Manager, Orthopaedic Nurse Prof. Tara Coughlan, Irish Gerontological Society Brian Donovan, Healthcare Pricing Office, HSE Catherine Farrell, Clinical Programme Trauma and Orthopaedic Michelle Fitzgerald, HSCP Lead Dr Patrick Higgins, Anaesthesia Representative Ursula Kelleher, IHFD Audit Coordinators Representative Lucy Nugent/John Kelly, Senior Healthcare Manager Mr Paddy Kenny, Consultant Orthopaedic Surgeon, or “Clinical Lead, Clinical Programme for Trauma and Orthopaedic Surgery Prof Geraldine McMahon, Emergency Medicine Representative Mr Maurice Neligan, Private Hospitals Association Dr Teresa O’Callaghan, HSE Quality Improvement Division Bibiana Savin, Public and Patient Interest (PPI) Representative Dr Mary Walsh, Representing the Health Research Board, Primary Care, RCSI
How do I get access to the IHFD?	Contact the IHFD Audit Manager (Louisebrent@noca.ie), who will then arrange access via the HPO.
What do I do if I forget my username and password?	Contact ihfd@noca.ie.
Can I view anyone else’s data?	No; each hospital is registered separately and can only view its local data.
Can more than one person in a hospital be given access to the database for data entry?	Yes, as many as you wish; however, the request must come from the clinical lead.
How long will it take to enter data?	Entering the data takes less than 15 minutes per patient entry, but time must be factored in for 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’.
Once submitted, can I retrieve records to edit content?	Yes, at any time.

APPENDIX 2: IHFD FREQUENTLY ASKED QUESTIONS

Question	Answer
What if date of trauma is not documented?	If unknown, enter '99-99-9999' for date and time fields only; otherwise, select the option 'Not documented'. Do not leave any question unanswered where possible.
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 the most likely time the 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). In this case, complete Q4H.
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)?	This 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 to screen for cognitive impairment (Mini-Mental State Examination) or presence of delirium (4AT).
What fracture type is classed as intertrochanteric?	Basal and basicervical fractures are to be classed as intertrochanteric.
What fracture types are recorded in the IHFD?	Hip fracture cases either identified as 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 arthroplasty?	Any replacement of the upper femur, including unipolar and bipolar hemiarthroplasties and total hip replacements.
What is a pathological fracture?	A broken bone, 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.
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 to 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.

APPENDIX 2: IHFD FREQUENTLY ASKED QUESTIONS

Question	Answer
What is an ASA grade?	<p>The American Society of Anesthesiologists (ASA) devised a pre-operative risk grade based on the presence of comorbidities at the time of surgery. Dripps, (1963) physical status classification is:</p> <ol style="list-style-type: none"> 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. <p>This grading does not take into account acute illness, hence a patient can be ASA 1 and 'unfit'.</p>
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.
Issues surrounding delay to surgery	<p>Please document only the main reason for delay. Options are:</p> <ul style="list-style-type: none"> • 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 free text 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. If you select 'Other', an empty box will appear so you can populate it with the reason for delay. • No operation performed.
What definition of pressure ulcer is used for the IHFD?	<p>Did the patient acquire a new pressure ulcer (Grade 2 or above) during the acute admission?</p> <ul style="list-style-type: none"> • 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 which 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?	<p>The ward round is a parade through the hospital of professionals where most decision-making concerning patient care is made. The round provides an opportunity for the multidisciplinary team to listen to the patient's narrative and jointly interpret their concerns. From this unfolds diagnosis, management plans, prognosis formation, and the opportunity to explore social, psychological, rehabilitation, and placement issues.</p> <p>Physical examination of the patient at the bedside still remains important (O'Hare, 2008).</p>

APPENDIX 2: IHFD FREQUENTLY ASKED QUESTIONS

Question	Answer								
What is a specialist falls assessment?	<p>A systematic assessment by a suitably trained person, e.g. a geriatrician or a specialist assessment trained nurse, which must cover the following domains:</p> <ul style="list-style-type: none"> • falls history (noting previous falls) • cause of index fall (including medication review) • risk factors for falling and injury (including fracture) • medication review <p>From this information, the assessor must formulate and document a plan of action to prevent further falls.</p>								
What is the definition of multidisciplinary rehabilitation assessment team?	<p>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.</p>								
What drugs constitute bone protection therapy?	<p>Not just calcium and vitamin D:</p> <table border="1"> <tbody> <tr> <td> 1. Bisphosphonates (oral, combined with calcium/vitamin D, intravenously) <ul style="list-style-type: none"> • Etidronate • Alendronate • Risedronate • Ibandronate • Zoledronate • Pamidronate </td><td> 4. Parathyroid hormone <ul style="list-style-type: none"> • PTH 1-34 • PTH 1-84 </td></tr> <tr> <td>2. Denosumab</td><td>5. Strontium Strontium ranelate</td></tr> <tr> <td> 3. HRT and SERMS <ul style="list-style-type: none"> • HRT (various) • Tibolone • Raloxifene </td><td> 6. Calcium and vitamin D Calcitriol Calcium and vitamin D – various Alpha-calcidol (or One alpha) </td></tr> <tr> <td></td><td>7. Calcitonin</td></tr> </tbody> </table>	1. Bisphosphonates (oral, combined with calcium/vitamin D, intravenously) <ul style="list-style-type: none"> • Etidronate • Alendronate • Risedronate • Ibandronate • Zoledronate • Pamidronate 	4. Parathyroid hormone <ul style="list-style-type: none"> • PTH 1-34 • PTH 1-84 	2. Denosumab	5. Strontium Strontium ranelate	3. HRT and SERMS <ul style="list-style-type: none"> • HRT (various) • Tibolone • Raloxifene 	6. Calcium and vitamin D Calcitriol Calcium and vitamin D – various Alpha-calcidol (or One alpha)		7. Calcitonin
1. Bisphosphonates (oral, combined with calcium/vitamin D, intravenously) <ul style="list-style-type: none"> • Etidronate • Alendronate • Risedronate • Ibandronate • Zoledronate • Pamidronate 	4. Parathyroid hormone <ul style="list-style-type: none"> • PTH 1-34 • PTH 1-84 								
2. Denosumab	5. Strontium Strontium ranelate								
3. HRT and SERMS <ul style="list-style-type: none"> • HRT (various) • Tibolone • Raloxifene 	6. Calcium and vitamin D Calcitriol Calcium and vitamin D – various Alpha-calcidol (or One alpha)								
	7. Calcitonin								
Minimum age?	<p>We collect data on all patients over the age of 18, but to date, we only report on those aged 60 and over.</p>								
What is the pre-fracture New Mobility Score	<p>This is a new field for 2016, and there has been communication directly with physiotherapy departments regarding the collection of this score. If you do not have a score recorded for any of Q6A, Q6B and Q6C, then leave them blank.</p>								
How do I calculate Q6D if not all fields are answered?	<p>Q6D will auto-calculate.</p>								
Does the CAS score need to be recorded daily?	<p>No, just on the day after surgery and again on the day of acute hospital discharge.</p>								
In relation to the CAS score what happens if the patient is discharged at the weekend and there are no physiotherapists on duty?	<p>Retrospectively fill it in on Monday based on the nursing note on the day of discharge, or the last physiotherapist's note if it was recent.</p>								
What is required for Q121– Where was the patient discharged to following the acute hospital spell?	<p>Fill in the option which represents the reason/intent for the patient's initial care after being discharged to a location other than home.</p>								

APPENDIX 3: FREQUENCY TABLES

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

FIGURE 4.2 IHFS 1: PERCENTAGE OF PATIENTS ADMITTED TO AN ORTHOPAEDIC WARD WITHIN 4 HOURS OR ADMITTED TO THEATRE FROM ED WITHIN 4 HOURS, BY INDIVIDUAL HOSPITAL, 2018 (N=3751) AND 2019 (N=3701)

HOSPITAL	2018			2019		
	n	N	%	n	N	%
Our Lady of Lourdes Hospital Drogheda	33	219	15%	122	217	56%
University Hospital Limerick	88	324	27%	150	278	54%
Cork University Hospital	140	455	31%	171	437	39%
Sligo University Hospital	49	115	43%	54	141	38%
Mayo University Hospital	45	146	31%	38	116	33%
Midland Regional Hospital Tullamore	38	228	17%	64	234	27%
St Vincent's University Hospital	77	358	22%	88	321	27%
Connolly Hospital Dublin	27	220	12%	54	220	25%
Letterkenny University Hospital	44	140	31%	28	121	23%
Mater Misericordiae University Hospital	~	164	*	26	157	17%
University Hospital Galway	14	229	6%	40	244	16%
Beaumont Hospital Dublin	23	205	11%	29	246	12%
St James's Hospital	11	164	7%	19	190	10%
University Hospital Waterford	29	426	7%	30	427	7%
Tallaght University Hospital	7	201	3%	*	200	*
University Hospital Kerry	*	157	*	~	152	*
National	637	3751	17%	923	3701	25%

~ Denotes 5 or fewer cases

* Further suppression is necessary to ensure that cells with five or fewer cases are not disclosed

FIGURE 4.3 IHFS 2: PERCENTAGE OF PATIENTS RECEIVING SURGERY WITHIN 48 HOURS (AND WITHIN NORMAL WORKING HOURS), BY INDIVIDUAL HOSPITAL, 2018 (n=3554) AND 2019 (n=3536)

HOSPITAL	2018			2019		
	n	N	%	n	N	%
St Vincent's University Hospital	322	338	95%	301	312	96%
Tallaght University Hospital	156	190	82%	168	192	88%
Connolly Hospital Dublin	177	213	83%	184	212	87%
Sligo University Hospital	81	115	70%	117	135	87%
Mayo University Hospital	96	134	72%	93	108	86%
Mater Misericordiae University Hospital	121	156	78%	123	145	85%
Letterkenny University Hospital	106	136	77%	98	119	82%
University Hospital Galway	162	217	75%	186	232	80%
Beaumont Hospital Dublin	145	196	74%	177	235	75%
Midland Regional Hospital Tullamore	165	214	77%	166	223	74%
St James's Hospital	124	158	78%	134	182	74%
University Hospital Kerry	88	142	62%	97	142	68%
University Hospital Limerick	156	298	52%	181	269	67%
Cork University Hospital	310	430	72%	281	419	67%
Our Lady of Lourdes Hospital Drogheda	131	201	65%	121	201	60%
University Hospital Waterford	221	416	53%	245	410	60%
National	2561	3554	72%	2672	3536	76%

APPENDIX 3: 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, 2018 (n=3567) AND 2019 (n=3498)

HOSPITAL	2018			2019		
	n	N	%	n	N	%
Connolly Hospital Dublin	~	213	*	~	212	*
University Hospital Waterford	~	409	*	~	405	*
Cork University Hospital	~	439	*	10	410	2%
University Hospital Kerry	~	151	*	9	143	6%
University Hospital Galway	~	215	*	~	230	2%
Sligo University Hospital	~	113	*	~	138	4%
Our Lady of Lourdes Hospital Drogheda	6	204	3%	~	199	*
Letterkenny University Hospital	~	132	*	0	118	0%
Mater Misericordiae University Hospital	~	157	*	~	143	*
Mayo University Hospital	~	141	*	6	110	5%
St Vincent's University Hospital	9	335	3%	~	300	*
Tallaght University Hospital	~	184	*	6	183	3%
University Hospital Limerick	12	309	4%	8	267	3%
Midland Regional Hospital Tullamore	9	219	4%	8	228	4%
Beaumont Hospital Dublin	15	194	8%	11	233	5%
St James's Hospital	18	152	12%	23	179	13%
National	101	3567	3%	108	3498	3%

~ Denotes 5 or fewer cases

* Further suppression is necessary to ensure that cells with five or fewer cases are not disclosed

FIGURE 4.5 IHFS 4: PERCENTAGE OF PATIENTS SEEN BY A GERIATRICIAN DURING ADMISSION, BY INDIVIDUAL HOSPITAL, 2018 (N=3751) AND 2019 (N=3701)

HOSPITAL	2018			2019		
	n	N	%	n	N	%
Our Lady of Lourdes Hospital Drogheda	73	219	33%	212	217	98%
St Vincent's University Hospital	339	358	95%	314	321	98%
University Hospital Galway	166	229	72%	234	244	96%
Beaumont Hospital Dublin	191	205	93%	234	246	95%
St James's Hospital	148	164	90%	181	190	95%
Mater Misericordiae University Hospital	162	164	99%	143	157	91%
University Hospital Waterford	389	426	91%	387	427	91%
Mayo University Hospital	51	146	35%	104	116	90%
Midland Regional Hospital Tullamore	181	228	79%	193	234	82%
Sligo University Hospital	92	115	80%	115	141	82%
University Hospital Limerick	253	324	78%	226	278	81%
Cork University Hospital	267	455	59%	328	437	75%
Tallaght University Hospital	113	201	56%	143	200	72%
Letterkenny University Hospital	80	140	57%	84	121	69%
Connolly Hospital Dublin	80	220	36%	95	220	43%
University Hospital Kerry	~	157	*	36	152	24%
National	2589	3751	69%	3029	3701	82%

~ Denotes 5 or fewer cases

* Further suppression is necessary to ensure that cells with five or fewer cases are not disclosed

APPENDIX 3: 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 2019 (n=3498)

BONE HEALTH ASSESSMENT	n	%
Started on this admission	1906	55%
Continued from pre-admission	572	16%
Awaits outpatient assessment	174	5%
Awaits DXA scan	413	12%
Assessed – no bone protection medication needed/ appropriate	224	6%
No assessment	200	6%
Not known	9	0%
Total	3498	100%

FIGURE 4.6A IHFS 5: PERCENTAGE OF PATIENTS WHO RECEIVED A BONE HEALTH ASSESSMENT, BY INDIVIDUAL HOSPITAL, 2018 (n=3567) AND 2019 (n=3498)

HOSPITAL	2018			2019		
	n	N	%	n	N	%
Beaumont Hospital Dublin	183	194	94%	227	233	97%
Connolly Hospital Dublin	124	213	58%	153	212	72%
Cork University Hospital	429	439	98%	398	410	97%
Letterkenny University Hospital	130	132	98%	118	118	100%
Mater Misericordiae University Hospital	157	157	100%	135	143	94%
Mayo University Hospital	35	141	25%	99	110	90%
Midland Regional Hospital Tullamore	210	219	96%	220	228	96%
Our Lady of Lourdes Hospital Drogheda	80	204	39%	195	199	98%
Sligo University Hospital	108	113	96%	125	138	91%
St James's Hospital	146	152	96%	173	179	97%
St Vincent's University Hospital	326	335	97%	298	300	99%
Tallaght University Hospital	176	184	96%	179	183	98%
University Hospital Galway	203	215	94%	225	230	98%
University Hospital Kerry	50	151	33%	112	143	78%
University Hospital Limerick	251	309	81%	260	267	97%
University Hospital Waterford	384	409	94%	372	405	92%
National	2992	3567	84%	3289	3498	94%

APPENDIX 3: FREQUENCY TABLES

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

FIGURE 4.7 IHFS 6: PERCENTAGE OF PATIENTS WHO RECEIVED A SPECIALIST FALLS ASSESSMENT, BY INDIVIDUAL HOSPITAL, 2018 (n=3567) AND 2019 (n=3498)

HOSPITAL	2018			2019		
	n	N	%	n	N	%
Beaumont Hospital Dublin	187	194	96%	227	233	97%
Connolly Hospital Dublin	57	213	27%	92	212	43%
Cork University Hospital	199	439	45%	305	410	74%
University Hospital Galway	140	215	65%	225	230	98%
Letterkenny University Hospital	123	132	93%	113	118	96%
Mater Misericordiae University Hospital	155	157	99%	137	143	96%
Mayo University Hospital	51	141	36%	98	110	89%
Midland Regional Hospital Tullamore	175	219	80%	188	228	82%
Our Lady of Lourdes Hospital Drogheda	129	204	63%	195	199	98%
Sligo University Hospital	94	113	83%	116	138	84%
St James's Hospital	148	152	97%	174	179	97%
St Vincent's University Hospital	327	335	98%	298	300	99%
Tallaght University Hospital	88	184	48%	128	183	70%
University Hospital Kerry	7	151	5%	39	143	27%
University Hospital Limerick	243	309	79%	219	267	82%
University Hospital Waterford	360	409	88%	358	405	88%
National	2483	3567	70%	2912	3498	83%

APPENDIX 3: FREQUENCY TABLES

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

CHAPTER 5: CASE MIX

GENDER	n	%
Male	1151	31%
Female	2550	69%
Total	3701	100%
AGE GROUP		
60-69	495	13%
70-79	1120	30%
80-89	1538	42%
90+	548	15%
Total	3701	100%
AGE GROUP BY GENDER		
Male		
60-69	176	15%
70-79	371	32%
80-89	476	41%
90+	128	11%
Total	1151	100%
Female		
60-69	319	13%
70-79	749	29%
80-89	1062	42%
90+	420	16%
Total	2550	100%
AGE ALL	80 (mean)	81 (median)
AGE MALE	79 (mean)	80 (median)
AGE FEMALE	81 (mean)	82 (median)
SOURCE OF ADMISSION	n	%
Home	3146	85%
Transfer from nursing or other long-stay facility	353	10%
Transfer from hospital in HIPE listing	185	5%
Other	17	0%
Total	3701	100%
ABBREVIATED MENTAL TEST (AMT)³¹	n	%
0-6 Cognitive impairment	153	25%
7-10 Normal cognition	470	75%
Total	623	100%

³¹ An AMT score was recorded for 623 patients only.

APPENDIX 3: FREQUENCY TABLES

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

CHAPTER 5: CASE MIX

ADM_ASA_GRADE ³²	n	%
1	104	3%
2	1201	36%
3	1799	53%
4	271	8%
5	6	0%
Total	3381	100%
PRE-FRACTURE MOBILITY, NEW MOBILITY SCORE (NMS) ³³	n	%
Low functional mobility	1754	50%
High functional mobility	1736	50%
Total	3490	100%
FRACTURE TYPE	n	%
Intracapsular – displaced	1519	41%
Intracapsular – undisplaced	321	9%
Intertrochanteric	1319	36%
Subtrochanteric	248	7%
Periprosthetic	103	3%
Other	41	1%
Not known	150	4%
Total	3701	100%

³² 320 patients did not have an ASA grade recorded and have been excluded from the analysis.

³³ Only patients with scores for all three types of mobility are included in this analysis; 211 patients did not have an NMS recorded for either indoor walking, outdoor walking, or shopping.

APPENDIX 3: FREQUENCY TABLES

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

FIGURE 6.1 MODE OF ADMISSION TO OPERATING HOSPITAL (N=3701)

SOURCE OF ADMISSION	n	%
Directly to ED in an operating hospital	3435	93%
Seen by an orthopaedic team	250	7%
Not known	16	0%
Total	3701	100%

FIGURE 6.1A MODE OF ADMISSION TO OPERATING HOSPITAL, BY HOSPITAL (N=3701)

HOSPITAL	Directly to ED in an operating hospital		Seen by an orthopaedic team		Not known	
	n	%	n	%	n	%
Beaumont Hospital Dublin	234	95%	7	3%	~	*
Connolly Hospital Dublin	187	85%	33	15%	0	0%
Cork University Hospital	417	95%	20	5%	0	0%
Our Lady of Lourdes Hospital Drogheda	207	95%	9	4%	~	0%
University Hospital Galway	208	85%	30	12%	6	2%
University Hospital Kerry	150	99%	~	1%	0	0%
Letterkenny University Hospital	118	98%	~	2%	0	0%
University Hospital Limerick	268	96%	10	4%	0	0%
Mater Misericordiae University Hospital	151	96%	~	3%	~	*
Mayo University Hospital	113	97%	~	2%	~	*
Sligo University Hospital	138	98%	~	2%	0	0%
St James's Hospital	175	92%	15	8%	0	0%
St Vincent's University Hospital	315	98%	6	2%	0	0%
Tallaght University Hospital	191	96%	7	4%	~	*
Midland Regional Hospital Tullamore	233	100%	~	0%	0	0%
University Hospital Waterford	330	77%	97	23%	0	0%
National	3435	93%	250	7%	16	0%

~ Denotes 5 or fewer cases

* Further suppression is necessary to ensure that cells with five or fewer cases are not disclosed

APPENDIX 3: FREQUENCY TABLES

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

FIGURE 6.2 CUMULATIVE TIME TO SURGERY (n=3536)

SURGERY TIME	Cumulative n	Cumulative %
<12 hours	214	6%
<24 hours	1533	43%
<36 hours	2114	60%
<48 hours	2700	76%
<60 hours	2893	82%
<72 hours	3126	88%
<84 hours	3210	91%
<96 hours	3316	94%
<108 hours	3351	95%
<120 hours	3402	96%
Total	3536	100%

FIGURE 6.3 PERCENTAGE OF PATIENTS BY TYPE OF ANAESTHESIA (n=3536)

TYPE OF ANAESTHESIA	n	%
SA only	1886	53%
SA and nerve block	757	21%
GA only	460	13%
GA and nerve block	298	8%
GA and SA	108	3%
Other	27	1%
Total	3536	100%

APPENDIX 3: FREQUENCY TABLES

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

FIGURE 6.3A PERCENTAGE OF PATIENTS BY TYPE OF ANAESTHESIA, BY HOSPITAL (n=3521)

HOSPITAL	GA		Both		SA		Total
	n	%	n	%	n	%	N
Connolly Hospital Dublin	52	25%	51	24%	109	51%	212
Midland Regional Hospital Tullamore	*	28%	~	1%	158	71%	223
University Hospital Limerick	*	9%	~	1%	242	90%	268
Letterkenny University Hospital	*	7%	~	3%	108	91%	119
Sligo University Hospital	41	30%	~	1%	92	68%	135
University Hospital Waterford	*	2%	~	0%	400	98%	410
Cork University Hospital	33	8%	14	3%	372	89%	419
University Hospital Kerry	~	*	~	*	129	93%	139
University Hospital Galway	46	20%	15	7%	167	73%	228
Mayo University Hospital	*	27%	~	*	78	72%	108
St James's Hospital	*	47%	~	*	95	53%	180
Mater Misericordiae University Hospital	*	50%	~	*	71	49%	145
St Vincent's University Hospital	*	43%	~	*	175	56%	311
Our Lady of Lourdes Hospital Drogheda	31	16%	~	*	163	82%	199
Beaumont Hospital Dublin	*	32%	~	*	158	67%	235
Tallaght University Hospital	*	32%	~	*	129	68%	190
Total	767	22%	108	3%	2646	75%	3521

- Denotes 5 or fewer cases

* Further suppression is necessary to ensure that cells with five or fewer cases are not disclosed

APPENDIX 3: FREQUENCY TABLES

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

FIGURE 6.4 PERCENTAGE OF PATIENTS RECEIVING PRE-OPERATIVE NERVE BLOCK (n=3536)

HOSPITAL	Nerve block		No nerve block		Not known		Total
	n	%	n	%	n	%	N
Connolly Hospital Dublin	70	33%	141	67%	~	*	212
Midland Regional Hospital Tullamore	162	73%	9	4%	52	23%	223
University Hospital Limerick	255	95%	14	5%	0	0%	269
Letterkenny University Hospital	18	15%	101	85%	0	0%	119
Sligo University Hospital	117	87%	17	13%	~	*	135
University Hospital Waterford	300	73%	86	21%	24	6%	410
Cork University Hospital	398	95%	21	5%	0	0%	419
University Hospital Kerry	26	18%	114	80%	~	*	142
University Hospital Galway	184	79%	32	14%	16	7%	232
Mayo University Hospital	11	10%	68	63%	29	27%	108
St James's Hospital	99	54%	75	41%	8	4%	182
Mater Misericordiae University Hospital	105	72%	14	10%	26	18%	145
St Vincent's University Hospital	199	64%	14	4%	99	32%	312
Our Lady of Lourdes Hospital Drogheda	62	31%	139	69%	0	0%	201
Beaumont Hospital Dublin	38	16%	193	82%	~	*	235
Tallaght University Hospital	78	41%	111	58%	~	*	192
Total	2122	60%	1149	32%	265	7%	3536

~ Denotes 5 or fewer cases

* Further suppression is necessary to ensure that cells with five or fewer cases are not disclosed

APPENDIX 3: FREQUENCY TABLES

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

FIGURE 6.5 PERCENTAGE OF PATIENTS BY NUTRITIONAL RISK ASSESSMENT (N=3701)

HOSPITAL	No assessment performed		Indicates malnourished		Indicates risk of malnutrition		Indicates normal		Total N
	n	%	n	%	n	%	n	%	
Midland Regional Hospital Tullamore	226	97%	~	*	*	2%	0	0%	234
University Hospital Galway	236	97%	~	*	~	*	~	2%	244
University Hospital Waterford	412	96%	0	0%	*	*	~	0%	427
University Hospital Limerick	254	91%	0	0%	*	*	~	0%	278
Cork University Hospital	316	72%	0	0%	71	16%	50	11%	437
Tallaght University Hospital	111	56%	~	*	*	*	69	35%	200
St Vincent's University Hospital	114	36%	14	4%	26	8%	167	52%	321
St James's Hospital	54	28%	4	2%	26	14%	106	56%	190
Letterkenny University Hospital	21	17%	0	0%	50	41%	50	41%	121
Mater Misericordiae University Hospital	20	13%	9	6%	43	27%	85	54%	157
Our Lady of Lourdes Hospital Drogheda	26	12%	~	*	7	3%	182	84%	217
Beaumont Hospital Dublin	29	12%	0	0%	41	17%	176	72%	246
Connolly Hospital Dublin	20	9%	0	0%	~	*	196	89%	220
Mayo University Hospital	9	8%	~	*	*	*	93	80%	116
University Hospital Kerry	7	5%	~	*	*	*	121	80%	152
Sligo University Hospital	0	0%	10	7%	29	21%	102	72%	141
Total	1855	50%	52	1%	390	11%	1404	38%	3701

- Denotes 5 or fewer cases

* Further suppression is necessary to ensure that cells with five or fewer cases are not disclosed

FIGURE 6.6 PERCENTAGE OF PATIENTS BY TYPE OF SURGERY (n=3536)

TYPE OF OPERATION	n	%
Arthroplasty hemi cemented	1282	36%
Internal fixation IM nail (short)	558	16%
Internal fixation DHS	543	15%
Internal fixation IM nail (long)	429	12%
Arthroplasty hemi uncemented	396	11%
Arthroplasty THR cemented	117	3%
Internal fixation screws	75	2%
Arthroplasty THR uncemented	52	1%
Other	84	2%
Total	3536	100%

APPENDIX 3: FREQUENCY TABLES

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

FIGURE 6.7 PERCENTAGE OF PATIENTS WITH CEMENTED OR UNCEMENTED ARTHROPLASTIES (n=1847)

TYPE OF ARTHROPLASTIES	n	%
Cemented	1399	76%
Uncemented	448	24%
Total	1847	100%

FIGURE 6.7A PERCENTAGE OF PATIENTS WITH CEMENTED OR UNCEMENTED ARTHROPLASTIES, BY HOSPITAL (n=1847)

HOSPITAL	Cemented		Uncemented		
	n	N	%	n	N
Beaumont Hospital Dublin	123	98%	~	2%	*
Connolly Hospital Dublin	108	99%	~	1%	*
Cork University Hospital	207	98%	~	2%	*
Our Lady of Lourdes Hospital Drogheda	93	89%	11	11%	104
University Hospital Galway	10	9%	100	91%	110
University Hospital Kerry	81	91%	8	9%	89
Letterkenny University Hospital	59	94%	~	6%	63
University Hospital Limerick	135	81%	32	19%	167
Mater Misericordiae University Hospital	61	97%	~	3%	*
Mayo University Hospital	54	84%	10	16%	64
Sligo University Hospital	50	74%	18	26%	68
St James's Hospital	77	99%	~	1%	*
St Vincent's University Hospital	33	21%	122	79%	155
Tallaght University Hospital	73	79%	19	21%	92
Midland Regional Hospital Tullamore	18	15%	103	85%	121
University Hospital Waterford	217	96%	10	4%	227
National	1399	76%	448	24%	1847

~ Denotes 5 or fewer cases

* Further suppression is necessary to ensure that cells with five or fewer cases are not disclosed

APPENDIX 3: FREQUENCY TABLES

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

FIGURE 6.8 PERCENTAGE OF PATIENTS BY MOBILISATION DAY OF OR DAY AFTER SURGERY, AND MOBILISED BY (n=3536)

MOBILISED AFTER SURGERY	n	%
Yes (by physiotherapist)	2732	77%
Yes (by other)	157	4%
Not mobilised	621	18%
Not known	26	1%
Total	3536	100%

FIGURE 6.8A PERCENTAGE OF PATIENTS BY MOBILISATION DAY OF OR DAY AFTER SURGERY, BY HOSPITAL (n=3510)

HOSPITAL	Yes (by physiotherapist)		Yes (by other)		Not mobilised		Total
	n	%	n	%	n	%	N
Cork University Hospital	242	58%	21	5%	155	37%	418
Tallaght University Hospital	112	58%	~	*	*	41%	192
Beaumont Hospital Dublin	161	70%	22	10%	47	20%	230
Midland Regional Hospital Tullamore	157	70%	23	10%	43	19%	223
St Vincent's University Hospital	225	72%	~	*	*	27%	312
University Hospital Waterford	313	77%	45	11%	48	12%	406
Sligo University Hospital	105	78%	22	16%	8	6%	135
St James's Hospital	140	81%	~	*	*	18%	174
Mayo University Hospital	87	81%	0	0%	21	19%	108
Connolly Hospital Dublin	179	84%	12	6%	21	10%	212
Our Lady of Lourdes Hospital Drogheda	171	86%	~	*	*	14%	200
University Hospital Kerry	118	86%	~	*	*	12%	137
Letterkenny University Hospital	108	91%	0	0%	11	9%	119
University Hospital Galway	215	93%	0	0%	17	7%	232
Mater Misericordiae University Hospital	137	96%	~	*	*	4%	143
University Hospital Limerick	262	97%	0	0%	7	3%	269
National	2732	78%	157	5%	621	18%	3510

- Denotes 5 or fewer cases

* Further suppression is necessary to ensure that cells with five or fewer cases are not disclosed

APPENDIX 3: FREQUENCY TABLES

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

FIGURE 6.8B PERCENTAGE OF PATIENTS WHO WERE ASSESSED BY A PHYSIOTHERAPIST ON THE DAY OF OR DAY AFTER SURGERY, BY HOSPITAL (n=3536)

HOSPITAL	n	N	%
Letterkenny University Hospital	119	119	100%
Our Lady of Lourdes Hospital Drogheda	199	201	99%
University Hospital Limerick	266	269	99%
University Hospital Galway	229	232	99%
Mater Misericordiae University Hospital	142	145	98%
Tallaght University Hospital	188	192	98%
Connolly Hospital Dublin	206	212	97%
Mayo University Hospital	104	108	96%
St James's Hospital	168	182	92%
University Hospital Kerry	129	142	91%
Beaumont Hospital Dublin	197	235	84%
Sligo University Hospital	113	135	84%
St Vincent's University Hospital	249	312	80%
Midland Regional Hospital Tullamore	173	223	78%
University Hospital Waterford	316	410	77%
Cork University Hospital	294	419	70%
National	3092	3536	87%

FIGURE 7.1 PERCENTAGE OF PATIENTS BY FUNCTIONAL OUTCOMES: CAS (n=1931)

DAY AFTER SURGERY	n	%
0	244	13%
1	139	7%
2	234	12%
3	1229	64%
4	49	3%
5	25	1%
6	11	1%
DAY OF DISCHARGE	n	%
0	97	5%
1	48	2%
2	95	5%
3	854	44%
4	147	8%
5	237	12%
6	453	23%
Total	1931	100%

APPENDIX 3: FREQUENCY TABLES

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

FIGURE 7.2 PERCENTAGE OF PATIENTS BY DESTINATION ON DISCHARGE (N=3701)

DISCHARGE DESTINATION	n	%
Off-site rehabilitation unit	1082	29%
Home	885	24%
Return admission to nursing home or long-stay care	505	14%
Convalescent care	469	13%
Other	269	7%
Died	203	5%
New admission to nursing home or long-stay care	158	4%
On-site rehabilitation unit	80	2%
Not known	50	1%
Total	3701	100%

FIGURE 7.3 PERCENTAGE OF PATIENTS BY CUMULATIVE LOS (N=3701)

LOS (DAYS)	n	%
≤1	34	1%
≤7	923	25%
≤14	2238	60%
≤30	3164	85%
≤60	3511	95%
≤90	3624	98%
≤120	3667	99%
Total	3701	100%

FIGURE 7.4 PERCENTAGE OF PATIENTS BY REOPERATION WITHIN 30 DAYS (n=3536)

REOPERATION WITHIN 30 DAYS	n	%
No	3058	86%
Yes	59	2%
Not known	419	12%
Total	3536	100%

APPENDIX 4: ADDITIONAL INFORMATION

TYPE OF TRAUMA	n	%
High-energy trauma	90	2%
Low-energy trauma	3521	95%
Not known	90	2%
Total	3701	100%
PATHOLOGICAL	n	%
Atypical	25	1%
Malignancy	56	2%
No	3346	90%
Not known	274	7%
Total	3701	100%
PREVIOUS FRAGILITY FRACTURE	n	%
Yes	1089	29%
No	2420	65%
Not known	192	5%
Total	3701	100%
GERIATRICIAN GRADE ³⁴	n	%
Consultant	2052	68%
Specialist Registrar (SpR)	392	13%
Registrar	527	17%
Other	40	1%
Not known	18	1%
Total	3029	100%
SURGEON GRADE ³⁵	n	%
Consultant	2008	57%
Specialist Registrar (SpR)	915	26%
Registrar	559	16%
Senior House Officer (SHO)	21	1%
Not known	33	1%
Total	3536	100%
ANAESTHETIST GRADE ³⁵	n	%
Consultant	3085	87%
Specialist Registrar (SpR)	82	2%
Registrar	178	5%
Senior House Officer (SHO)	74	2%
Not known	117	3%
Total	3536	100%
MULTIDISCIPLINARY REHABILITATION TEAM ASSESSMENT ³⁶	n	%
Yes	3285	94%
No	202	6%
Not known	11	0%
Total	3498	100%

³⁴ Only includes patients assessed by a geriatrician during their acute admission.

³⁵ Only includes patients who received surgery during their acute admission.

³⁶ Excludes patients who died in hospital.

APPENDIX 5: SPECIFICATIONS FOR COMPOSITE VARIABLES

See Appendix 1: Dataset for question references.

FIGURE 4.2 ADMISSION TO ORTHOPAEDIC WARD OR THEATRE WITHIN 4 HOURS FROM ED

4.2.1. Composite variable based on Q3–Q4B, Q4F–Q4H, and 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 directly 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

*If patients go to theatre directly from ED, and within 4 hours of first presentation, they are included.

4.2.2. Time interval determination for patients admitted to orthopaedic ward (Q5=1):

- If admitted via ED (Q4=1), then the time interval is calculated from the date and time of arrival at the first presenting hospital (Q3–Q3A) or from the date and time of arrival at the ED of the operating hospital (Q4A–Q4B), whichever is earlier, to the date and time admitted to an orthopaedic ward (Q5A–Q5B).
- If not admitted via ED (Q4=2), then (i) for inpatient fall cases (Q4H=1), the time interval is calculated from the date and time seen by an orthopaedic team in the operating hospital (Q4F–Q4G) to the date and time admitted to an orthopaedic ward (Q5A–Q5B); (ii) for other cases, the time interval is calculated from the date and time of arrival at either the first presenting hospital (Q3–Q3A) or from the date and time seen by an orthopaedic team (Q4F–Q4G), whichever is earlier, to the date and time admitted to an orthopaedic ward (Q5A–Q5B); and if the date and time of arrival at the first presenting hospital (Q3–Q3A) is not recorded, and the date and time seen by an orthopaedic team (Q4F–Q4G) postdates the date and time admitted to an 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 and times are missing; or the interval range is invalid, i.e. <0 minutes; or the interval is implausible, i.e. >525,600 minutes (1 year)

APPENDIX 5: 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 (Monday–Sunday 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 (Monday–Sunday 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

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 the date and time of arrival at the first presenting hospital (Q3–Q3A), or from the date and time of arrival at the ED of the operating hospital (Q4A–Q4B), whichever is earlier, to the date and 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 and time admitted to an 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 an orthopaedic team in the operating hospital (Q4F–Q4G) to the date and time of surgery (Q12E–Q12F); (ii) for other cases, the time interval is calculated from the date and time of arrival at either the first presenting hospital (Q3–Q3A) or from the date and time seen by an orthopaedic team (Q4F–Q4G), whichever is earlier, to the date and time of surgery (Q12E–Q12F); (iii) if the date and time of arrival at the first presenting hospital (Q3–Q3A) is not recorded, and the date and time seen by an orthopaedic team (Q4F–Q4G) postdates the date and time admitted to an orthopaedic ward (Q5A–Q5B), then the time interval is calculated from the date and time of admission to an 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 and time admitted to an 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 (Monday–Sunday 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 (Monday–Sunday 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 (1 year)
Not known	If relevant dates and times are missing; or interval is invalid, i.e. <0 minutes; or interval is implausible, i.e. >525,600 minutes (1 year)

NOTES

Phone: **+353 1 4028577**

Email: **ihfd@noca.ie**

Twitter: **@noca_irl**

www.noca.ie

