NOCA National Office of Clinical Audit | INAS Irish National Audit of Stroke

# IRISH NATIONAL AUDIT OF STROKE

## NATIONAL REPORT 2024 AND ORGANISATIONAL AUDIT REPORT 2025



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## ABOUT THE NATIONAL OFFICE OF CLINICAL AUDIT

The National Office of Clinical Audit (NOCA) was established in 2012 to create sustainable clinical audit programmes at national level. NOCA is funded by the Health Service Executive's Office of the Chief Clinical Officer, and is operationally supported by the Royal College of Surgeons in Ireland. The National Clinical Effectiveness Committee defines national clinical audit as "a cyclical process that aims to improve patient care and outcomes by systematic, structured review and evaluation of clinical care against explicit clinical standards on a national basis" (National Clinical Effectiveness Committee, 2015, p. 2). NOCA supports hospitals to learn from their audit cycles.


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15th October 2025

Dear Professor Harbison,

On behalf of the NOCA Governance Board, I wish to acknowledge receipt of the Irish National Audit of Stroke National Report 2024 and Organisational Audit Report 2025.

We extend our sincere congratulations to you and the entire team, including Audit Manager Joan McCormack, Research Analyst Olga Brych, and the Governance Committee, for producing this significant report.

This report provides vital insight into the organisation and delivery of stroke services across Ireland. It reinforces the importance of fully implementing the National Stroke Strategy 2022–2027 and demonstrates how robust data can guide improvements in stroke unit capacity, staffing, and governance.

We commend the continued dedication of audit personnel and hospital teams in maintaining high-quality data collection that underpins this essential work.

This letter serves as the formal endorsement of the NOCA Governance Board for the Irish National Audit of Stroke National Report 2024 and Organisational Audit Report 2025.

**Dr Brian Creedon**
**Clinical Director**
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# FOREWORD

It gives me great pleasure to welcome the Irish National Audit of Stroke National Report 2024 and Organisational Audit Report 2025. The Irish National Audit of Stroke (INAS) is our most important tool for establishing reliable metrics in relation to stroke care in Ireland, allowing us to assess national performance in relation to international best practice, highlighting areas of strength and identifying opportunities for improvement to service delivery and patient care. This report incorporates key findings from the INAS clinical audit (January - December 2024) and reflects the current status (2025) of stroke care organisation and clinical care across every hospital in the Republic of Ireland that provides acute stroke services in 2025 (24 in total). The report therefore provides nationally representative, comprehensive and detailed up-to-date information that is of key interest to all involved in stroke in Ireland – patients and their families, healthcare professionals, patient advocacy groups, researchers, and those involved in developing and implementing policy in relation to stroke prevention and care.

As one of the co-investigators of the first national audit of stroke care conducted in 2005-2007 (published in 2008), which included a focus on care organisation, it is heartening to see the substantial improvements that have taken place in the organisation of stroke care in Ireland over that 20-year period. This report identifies sustained improvements in many areas across the trajectory of acute stroke care, including an increase in pre-alert calls from ambulances to emergency departments for all FAST calls; all but two hospitals having formal recognition of a consultant physician with stroke specialist knowledge as stroke lead for the hospital; improvements in availability of radiology staff and services; all hospitals have a dedicated stroke unit, with an increase nationally in the number of stroke unit beds; and an increase in the number of hospitals providing early supported discharge.

Despite these improvements there are concerning trends that put at risk the quality of our stroke care. There is a need to formalise a single definition of stroke nationally where currently two different definitions are in use, otherwise casemix statistics are not comparable across hospitals. Other important findings from this report highlight that, while there has been a 2% increase in the number of stroke unit beds nationally since 2021, the number of stroke admissions has increased by 13% in the same period, thus creating a growing discrepancy in the number of stroke unit beds available to patients admitted with stroke. As a result, despite all hospitals having a stroke unit, the number of patients with stroke who have access to a stroke unit bed has decreased by 10% in the 4-year period since 2021, with almost half of patients treated in a bed outside of a stroke unit, thus falling far short of the 90% target recommended by national and international guidelines. Compounding this issue is a deficit in key stroke team staffing required to meet international standards to be considered a stroke unit, including shortfalls in numbers of nursing staff, physiotherapists, occupational therapists and speech and language therapists. In addition, there are significant deficiencies in numbers of medical social workers, psychologists and dieticians. While there is some availability of psychological services in a minority of hospitals, there is no input of psychology to early supported discharge teams. As psychological deficits (cognition, fatigue, mood) are very common after stroke, the need to increase availability of psychological services is particularly acute.

Ongoing improvement in stroke care in Ireland is critical to enable the national stroke service to deliver quality stroke care that meets international standards. Areas of stroke care where improvement has occurred and meet international standards need to be sustained. Disimprovements in the organisation of stroke care jeopardise the quality of care delivered and the outcomes for patients with stroke. Strong and clearly documented standards of care articulated by the HSE (2012, 2022), the National Clinical Guideline for Stroke in the UK and Ireland (2023), and the ESO (2013- specific to stroke unit care) need to be supported by appropriate resourcing to enable stroke services to reach and sustain best practice guidelines.



This report reflects the continued commitment in Ireland to patient-centred stroke care and to a data-informed approach to quality care improvement, dictated by international evidence and current best practice. Credit to all of the clinical teams involved in diligently collecting the data that fed into this report, providing transparency in relation to the current status of our stroke services and patient experiences and outcomes at the point of hospital discharge. The representativeness and comprehensiveness of this data enables areas for improvement to be identified and monitored on a continuous basis so that everything possible is done to maximise the quality of care delivered to and received by anyone in Ireland who experiences a stroke.

**Professor Anne Hickey**
**Professor of Psychology**
**RCSI University of Medicine and Health Sciences**

# GLOSSARY OF TERMS AND DEFINITIONS

| ACRONYM | FULL TERM |
|---|---|
| AHA | American Heart Association |
| ANP | advanced nurse practitioner |
| ASA | American Stroke Association |
| carotid endarterectomy | Carotid endarterectomy is surgery that removes plaque build-up from inside a carotid artery in the neck. |
| carotid stenosis | Carotid stenosis is a narrowing of the carotid arteries, the two major arteries that carry oxygen-rich blood from the heart to the brain. |
| carotid stenting | Carotid stenting is a procedure in which an interventional neuroradiologist (ideally) or a vascular surgeon inserts a stent that expands inside the carotid artery in order to increase blood flow in areas blocked by plaque. |
| CNS | clinical nurse specialist |
| CT | computed tomography – a scanning technique that uses X-rays to take highly detailed images of the body/brain |
| CTA | computed tomography angiography |
| CTP | computed tomography perfusion |
| DSA | digital subtraction angiography |
| ECG | electrocardiogram |
| echo | echocardiogram |
| ED | emergency department |
| ESD | Early Supported Discharge |
| ESO | European Stroke Organisation |

| ACRONYM | FULL TERM |
|---|---|
| EVT | endovascular thrombectomy |
| haemorrhagic stroke | Haemorrhagic stroke occurs when a blood vessel in the brain leaks or ruptures. |
| HCA | healthcare assistant |
| HDU | high dependency unit |
| HSCP | health and social care professional |
| HSE | Health Service Executive |
| ICU | intensive care unit |
| INAS | Irish National Audit of Stroke |
| ischaemic stroke | This is the most common type of stroke. It happens when the brain's blood vessels become narrowed or blocked, causing severely reduced blood flow (ischaemia). |
| MDT | multidisciplinary team |
| median | The median is the middle number in a sorted (ascending or descending) list of numbers and can be more descriptive of that dataset than the mean. |
| MRA | magnetic resonance angiography |
| MRI | magnetic resonance imaging |
| mRS | modified Rankin Scale |
| N/A | not applicable |
| NIHSS | National Institutes of Health Stroke Scale |
| NIMIS | National Integrated Medical Imaging System |
| NOCA | National Office of Clinical Audit |

| ACRONYM | FULL TERM |
|---|---|
| PFO | patent foramen ovale |
| Protocol 37 | This is the National Ambulance Service's Emergency Inter-Hospital Transfer Policy. |
| RGN | registered general nurse |
| subarachnoid haemorrhage | A subarachnoid haemorrhage is a life-threatening type of stroke caused by bleeding into the space surrounding the brain. |
| SPSS | Statistical Package for the Social Sciences |
| stroke unit | A stroke unit is a geographically discrete area in a ward where patients with a stroke are cared for by a multidisciplinary team that has specialist knowledge, protocols, training and skills in stroke care as well as the ability to monitor and regulate basic physiological function. |
| TIA | Transient ischaemic attack |
| thrombectomy | A thrombectomy is the mechanical removal of a blood clot in the brain. |
| thrombolysis | Thrombolysis is the breakdown of blood clots formed in blood vessels using medication. |
| TOE | transoesophageal echocardiogram |
| WHO | World Health Organization |
| WTE | whole-time equivalent |

# EXECUTIVE SUMMARY

This is the sixth Irish National Audit of Stroke (INAS) National Report and includes the findings from the second INAS Organisational Audit Report. The purpose of the report is to audit the clinical care and organisation of stroke services in hospitals that provide acute stroke services against the recommendations in the following publications:

1. *National Clinical Guideline for Stroke for the United Kingdom and Ireland* (Intercollegiate Stroke Working Party, 2023)
2. *National Stroke Strategy 2022-2027* (NSS) (Health Service Executive, 2022)
3. European Stroke Organisation recommendations to establish a stroke unit and stroke center (Ringelstein *et al.,* 2013)
4. *Stroke Clinical Care Programme: Model of Care* (Health Service Executive, 2012).

A hospital was considered eligible to participate if it provided acute stroke services in 2025. In 2025, 24 hospitals fulfilled this criterion and all 24 hospitals are reported on within this report. A survey was disseminated via email to each hospital on 5 March 2025, with a request to have the survey returned within 1 month. The clinical teams submitted the data following agreement by the hospital manager/chief executive officer.

All data from the INAS Organisational Audit survey are reported at national level within the report and key items are reported at hospital level. All data are reported at hospital and national level in the INAS Organisational Audit National Reporting Table.

Key findings and trends since 2021 from the INAS clinical audit 2024 can be found in Chapter 4. All findings, by hospital, can be found in the INAS National Reporting Table 2024.

While the organisation of stroke services has improved significantly since the first national audit of stroke services in 2006 (Horgan *et al.,* 2008), the findings of this report indicate that, since 2021, there have been improvements, persistent deficiencies and variation in the organisation and delivery of stroke care in hospitals (National Office of Clinical Audit, 2022b).

There has been a 13% increase in annual stroke admissions since 2021; however, there has only been a 2% increase in the number of stroke unit beds, from 239 in 2021 to 244 in 2025.

The number of hospitals that receive ambulance service pre-alert calls to emergency departments (EDs) for all FAST (Face, Arms, Speech, Time) calls increased from 17 in 2021 to 22 in 2025. Additionally, 23 participating hospitals (96%) now have on-call radiographers on-site available to perform brain imaging – up from 16 in 2021 – and 9 hospitals (38%) have on-call radiologists on-site, compared with just 3 in 2021. These organisational changes have led to sustained improvements in the time from hospital arrival to medical team assessment and the time to brain imaging as reported annually in the INAS (National Office of Clinical Audit, 2025; National Office of Clinical Audit, 2023).

Access to stroke unit beds, the most important intervention for all patients with a stroke, remains low. In 2024, 73% of patients accessed a stroke unit bed, increased from 70% in 2021, but far below the target of 90% (Health Service Executive, 2012). While all participating hospitals report the presence of a stroke unit, many of these units do not fully comply with the defined standards in the United Kingdom (UK) and Ireland (Intercollegiate Stroke Working Party, 2023) or essential characteristics required for a European Stroke Organisation-accredited stroke unit (Ringelstein *et al.,* 2013). For example, consultant-led ward rounds should occur daily in acute stroke units; however, this is only available in 10 hospitals, and 6 hospitals report that patients with a stroke are not transferred to the care of the stroke team/stroke consultant after admission. In addition, there are persistent staffing deficits in all disciplines required to provide specialist stroke care within stroke units.

There has also been an improvement in the number of hospitals with access to Early Supported Discharge (ESD) teams, from 10 in 2021 to 14 in 2025.

It is essential for all hospitals to strengthen the governance structures within their stroke services. Effective governance ensures ongoing monitoring of processes and procedures, and review of audit results. This approach facilitates the timely identification of areas for improvement and supports the implementation of targeted quality improvement initiatives, ultimately enhancing patient outcomes and service efficiency.

In addition, national agreement on the definition of stroke should be prioritised in order to ensure consistency in diagnosis, reporting, treatment and research.

The full implementation of the NSS (Health Service Executive, 2022) is recommended. Key findings are presented thematically below.

# KEY FINDINGS

## GOVERNANCE

- Most hospitals (n=22; 92%) reported that there is a consultant physician with specialist knowledge in stroke who is formally recognised as having principal responsibility for stroke services.
- Nineteen hospitals (79%) reported that they have a stroke governance committee, which is a decrease from 20 in 2021.
- There is variation between hospitals in how the diagnosis of stroke is defined, with 58% of hospitals reporting that they use the American Heart Association/ American Stroke Association definition of stroke and 42% reporting that they use the World Health Organization definition (Table 5.1).
- Eighteen hospitals (75%) reported that patients with a stroke are always or usually transferred to the care of the stroke team/stroke consultant after admission.

## ORGANISATION OF EMERGENCY CARE



- There has been a 13% increase in stroke admissions, from 6,089 in 2021 to 6,882 in 2024. The difference was greater in some hospitals, with 12 (50%) admitting at least 13% more patients with a stroke compared with how many they admitted in 2021 (Table 5.1).
- Twenty-two hospitals receive an ambulance service pre-alert for all FAST (Face, Arms, Speech, Time) calls, which is an increase from 17 hospitals in 2021.
- As in 2021, almost all hospitals (n=23; 96%) reported that they provide a thrombolysis service 24 hours a day, 7 days a week.
- Eleven hospitals (46%) have on-call stroke teams available 24 hours a day, 7 days a week; 6 (25%) have on-call stroke teams available from Monday–Friday, 9.00am–5.00pm; and 7 (29%) do not have on-call stroke teams (Table 5.3).
- Twenty-three hospitals (96%) have an on-call radiographer on-site, available to perform brain imaging – which is an increase from 16 in 2021 – and 9 hospitals (38%) have an on-call radiologist on-site, which is an increase from 3 in 2021.
- In 13 hospitals (54%), patients who received thrombolysis were most likely to be admitted to a coronary care unit (CCU), high dependency unit (HDU) or intensive care unit (ICU) after leaving the ED.
- Six hospitals (25%) operate a transient ischaemic attack (TIA)/neurovascular clinic, which is an increase from four in 2021; however, the majority (n=23; 96%) of hospitals routinely admit patients with TIA.

# KEY FINDINGS



## ORGANISATION OF STROKE UNITS

| |
|---|
| All 24 hospitals reported having a dedicated stroke unit, and 2 hospitals provide a 24/7 endovascular thrombectomy (EVT) service. |
| The total number of designated stroke unit beds was reported as 244, a 2% increase from 239 in 2021. Thirty eight percent of beds (n=93) were reported as monitored beds, which is an increase from 31% (n=74) in 2021. Ten hospitals (42%) reported that there were no monitored beds in the stroke unit. |
| Sixty percent of patients with a stroke had access to a stroke unit bed, which is a decrease from 70% in 2021. |
| At the time of the survey, 54% of patients with a stroke were in a stroke unit bed. |
| In most hospitals, stroke service cover is provided by geriatric medicine, both during normal working hours (n=20; 83%) and out of hours (n=16; 67%). Less than one-half (46%; n=11) of hospitals report that there is a specialist stroke service working independently from other roles or responsibilities. |
| There were staffing deficits across all members of the multidisciplinary team: nursing: 31% deficit; physiotherapy: 48% deficit; occupational therapy: 54% deficit; speech and language therapy: 23% deficit; dietetics: 65% deficit; psychology: 74% deficit; and medical social work: 76% deficit. |
| Almost all hospitals (n=23; 96%) made use of the Irish Heart Foundation's online support services. |



## ACCESS TO BRAIN IMAGING AND SPECIALIST INVESTIGATIONS

| |
|---|
| Nine hospitals (38%) have access to computed tomography perfusion (CTP) for patients in the ED, which is an increase from five in 2021. |
| Five hospitals (22%) report limited out-of-hours access to magnetic resonance imaging. |
| Computed tomography angiography (CTA) is considered a standard of care for acute stroke and is performed as a routine investigation for all patients with a stroke in 16 hospitals (67%). The remaining eight hospitals (33%) perform CTA only for patients who are eligible for specific treatment (i.e. thrombectomy). |
| All hospitals have access to a range of cardiac rhythm monitoring in order to detect paroxysmal atrial fibrillation. |

# KEY FINDINGS



## ORGANISATION OF ESD SERVICES

| | |
|---|---|
| | Fourteen hospitals (58%) have access to an ESD team, an increase from 10 in 2021. |
| | All ESD teams provide a next-working-day service to patients being discharged home with ESD, and 9 teams can provide the service a minimum of 5 days per week if required. |
| | The majority of hospitals (n=12; 92%) report that the standard provision of ESD is 4–8 weeks. |
| | All ESD teams are resourced to provide physiotherapy, occupational therapy, and speech and language therapy. However, the clinical nurse specialist and medical social worker are not resourced in more than one-half of ESD teams, and therapy assistants are not resourced in four teams. |

# KEY FINDINGS

## ORGANISATION OF EMERGENCY CARE



**22** hospitals provide a thrombolysis service 24 hours a day, 7 days a week, **unchanged** from 2021.

**Thrombolysis is the delivery of a clot dissolving medication which aims to dissolve a blood clot which is blocking an artery in the brain.**

**CLINICAL IMPACT**

**531 patients received thrombolysis, an increase from 432 in 2021.**



**2** hospitals provide a national thrombectomy service 24 hours a day, 7 days a week, **unchanged** from 2021.

**Thrombectomy is a procedure where large clots are removed from arteries in the brain.**

**497 patients received a thrombectomy, an increase from 422 in 2021.**



**11** hospitals have on-call stroke teams available 24 hours a day, 7 days a week – **unchanged** from 2021.

**53% of patients were reviewed by a doctor within 10 minutes of hospital arrival, an improvement from 48% in 2021**



**22** hospitals receive an ambulance service pre-alert for all Face, Arms, Speech, Time (FAST) calls, **an increase** from 17 in 2021.



**23** hospitals have an on-call radiographer on-site, available to perform brain imaging, an increase from 16 in 2021. 9 hospitals have an on-call radiologist on-site, **an increase** from three in 2021.

**50% of patients had a brain scan within 60 minutes, an improvement from 48% in 2021.**

## ORGANISATION OF EARLY SUPPORTED DISCHARGE (ESD) SERVICES



**ESD helps people recovering from a stroke to go home from hospital earlier, while still getting the therapy and support they need at home from a dedicated stroke team**

**14** hospitals have access to an ESD team, **an increase** from 10 in 2021.



All ESD teams provide a next working day service to patients being discharged home with ESD.

**9** teams can provide a minimum of five days per week if required.

**CLINICAL IMPACT**

**680 patients were discharged home with ESD, an increase from 530 in 2021.**

## ORGANISATION OF STROKE UNITS

**CLINICAL IMPACT**



The number of stroke unit beds has **increased** from 239 in 2021 to **244** in 2025.

**The proportion of patients admitted to a stroke unit has increased (73%) but below the target of 90%.**



**22** hospitals had a consultant physician who is an expert in stroke and officially recognised as the main person in charge of stroke care services, **unchanged** since 2021.

**The proportion of hospital stay in a stroke unit is unchanged (69%) and below the target of 90%.**



The number of advanced nurse practitioners in stroke **increased** from 7 in 2021 to **12** in 2025.



All Health and Social Care Professions had staffing shortages, with gaps compared to recommended levels in Nursing (31%), Physiotherapy (48%), Occupational Therapy (54%), Speech & Language Therapy (23%), Dietetics (65%), Psychology (74%) and Medical Social Work (76%).

**The numbers of patients assessed by Health and Social Care Professions has increased annually despite the staffing deficits.**



A swallow screening training programme is available in all hospitals, **an increase** from **21** hospitals in 2021.

**The proportion of patients who receive a swallow screen has improved from 68% in 2021 to 81% in 2024.**

## OUTCOMES

| | OUTCOME QUALITY INDICATORS | 2021 | 2024 |
|---|---|---|---|
| | Length of stay in acute hospital (average number of days) | 15 | 17 |
| | Length of stay in a stroke unit (average number of days) | 11 | 13 |
| | Discharged to long term care | 6% | 7% |
| | Unadjusted in-hospital mortality - all stroke types | 12% | 11% |

# RECOMMENDATIONS

## RECOMMENDATION 1

**All stroke units should have continuous access to a consultant physician with expertise in stroke medicine, with consultant review 5 days per week.**



## RECOMMENDATION 2

**Hospitals that admit patients with acute stroke should ensure that a sufficient number of designated stroke unit beds are available in order to provide high-quality stroke care.**



## RECOMMENDATION 3

**All stroke units should be resourced to provide stroke specialist rehabilitation.**



## RECOMMENDATION 4

**Stroke units must be staffed with nurses with special interest, training and expertise in stroke care.**



## RECOMMENDATION 5

**Hospitals should increase the number of appropriately resourced ESD teams in order to improve access.**



## RECOMMENDATION 6

**All hospitals that provide acute stroke services should ensure that there is a stroke service governance committee.**



## RECOMMENDATION 7

**All patients with a stroke should have access to routine and advanced imaging at all times.**



## RECOMMENDATION 8

**National agreement on how the definition of stroke should be classified should be prioritised.**



# PATIENT STORY

## Gerry's story
## From stroke to strength

It was an ordinary evening in November 2017 when Gerry Stevens, an accomplished national radio DJ, settled into his chair to watch television. At 50 years old, he was in his prime, living a life defined by words and voice. Without warning, Gerry began to feel strange: nauseous, flushed and aware that his tongue didn't feel right. Within minutes, the left side of his face began to droop. He tried to brush it off, but he developed pins and needles throughout his left arm and leg. When he attempted to stand, he collapsed; his body suddenly wouldn't respond.

His partner, Ann, recognised the signs of a stroke and called for help. What followed was what Gerry described as the scariest moment of his life. At the hospital, doctors confirmed he'd suffered a brain haemorrhage – a bleed, not a clot, caused by undiagnosed hypertension (high blood pressure). His blood pressure had spiked beyond 200 mm/Hg (millimeters of mercury). He was told that unlike most stroke victims, who experience clots, his stroke was caused by a more dangerous internal rupture.

## The silence inside

In the hospital, Gerry could no longer move the left side of his body, nor speak properly. "Everything just stopped," he later recalled. "When I spoke, I sounded angry or drunk or both." Although his mind was alert and his thoughts intact, his words no longer came out right. This disconnect was devastating for a man whose life had been built on communication. "It robbed me of my voice," he said, "and my dignity." Hearing the familiar voices of friends and family but not being able to respond was particularly painful.

Gerry spent 1 month at Our Lady of Lourdes Hospital Drogheda, followed by 2 months in the rehabilitation unit at Louth County Hospital in Dundalk. There, he began the long, slow climb back to himself.

## Rebuilding: One word, one step at a time

Gerry's recovery began with the basics: sitting upright, gripping utensils and breathing properly. Physiotherapists helped him regain control of his limbs; occupational therapists taught him how to wash, dress and eat again. Speech and language therapists focused on breathing control and articulation, training Gerry to enunciate 'plosive' sounds like 'P' and 'B'.

After returning home, support continued with the Early Supported Discharge team. The different members of the team visited Gerry regularly, helping with exercises and routines tailored to everyday tasks. Over time, he began speaking more clearly and walking unaided.




**"Within minutes, the left side of his face began to droop. He tried to brush it off, but he developed pins and needles throughout his left arm and leg. When he attempted to stand, he collapsed; his body suddenly wouldn't respond."**

## The long road home

But recovery wasn't just physical; Gerry struggled emotionally. "I felt like I had become someone else," he admitted. "Even though I was the same person in my head, I had to prove it to myself, and others, all over again."

In order to rebuild his confidence, Gerry joined community rehabilitation classes at a local gym. There, among other stroke survivors, he found a sense of shared struggle and shared victory. Together, they celebrated small wins: a properly formed sentence, a steady hand, a confident laugh.

Two years after the stroke, Gerry still faced challenges, such as spasms in his left foot and limited movement in his hand. But he had also returned to driving and even bought an adapted motorcycle. "I needed to feel independent again," he explained. "I wanted to show that life continues, just differently."

**"I felt like I had become someone else," he admitted. "Even though I was the same person in my head, I had to prove it to myself, and others, all over again."**

## A voice for others

Determined to share what he had learned, Gerry launched *The Strokecast*, a podcast featuring stroke survivors and medical professionals. His aim was to spread awareness, offer hope and remind people that strokes don't just happen to the elderly.

He championed the **FAST** approach to stroke awareness:

- **F**ACE DROOPING
- **A**RM WEAKNESS
- **S**PEECH DIFFICULTIES
- **T**IME TO CALL EMERGENCY SERVICES.

"Every minute counts," he warns. "You lose 1.9 million brain cells each minute during a stroke. Time is brain."

## Today and tomorrow

Gerry's story is a testament to resilience and second chances. From losing his voice to finding it again through his podcast, Gerry turned tragedy into purpose. He has recently returned to the airwaves on Dublin City FM, and his work sharing his and other stroke survivors' stories will live on in hearts and minds.



# 1. INTRODUCTION

# 1. INTRODUCTION

## BACKGROUND

For hundreds of years, doctors have been pessimistic or nihilistic about the treatment of stroke. In 1993, Peter Langhorne and colleagues demonstrated that stroke unit care saved lives and reduced disability. Stroke unit care is superior to care on a general medical ward and is applicable to all stroke patients, regardless of age, sex, or stroke pathology or severity (Langhorne *et al.,* 2020). Clot-busting drugs were developed in 1995, and in 2014, clot retrieval (thrombectomy) was proven to work for those patients with a large vessel occlusion. In response to these developments, the Health Service Executive (HSE) has made concerted efforts to deliver high-quality healthcare to stroke patients.

Reporting on the organisation of acute stroke services in Ireland commenced in 2006 (Horgan *et al.,* 2008). That report found that only one hospital in Ireland had a stroke unit, that treatment with thrombolysis was limited, and that the patient journey was fragmented and poorly organised. Since 2008, there have been important changes in the organisation and delivery of acute stroke services in Ireland through the establishment of the HSE's National Clinical Programme (NCP) for Stroke. The NCP for Stroke published the *Stroke Clinical Care Programme: Model of Care* (HSE, 2012), and implementation of the model of care was monitored through the establishment of the National Stroke Register, which came under the governance of the National Office of Clinical Audit (NOCA) and became the Irish National Audit of Stroke (INAS) in 2019. The aim of the INAS is to conduct audit of stroke care, including clinical care and service organisation. Further information on the aims and objectives of the INAS can be found on the NOCA website. Audit of clinical care provided to patients with a stroke has been reported annually since 2014, with the most recent report published in 2025 (NOCA, 2025).

The second organisational audit (McElwaine *et al.*, 2015) reported substantial improvements in the organisation of stroke services throughout the country, such as the increased number of stroke units (from 1 to 21) and an increase in the thrombolysis rate (from 1% to 11%), between 2008 and 2015. The impact of these improvements was demonstrated by a reduction in in-hospital mortality from 19% in 2008 to 14% in 2015, and the finding that only 8% of patients with a stroke were newly admitted to nursing homes in 2015, compared with 15% in 2008.

The first *Irish National Audit of Stroke: Organisational Audit Report 2021* (NOCA, 2022b) reported further national reorganisation of acute stroke care, with a reduction in the number of hospitals providing 24/7 acute stroke services (from 27 to 24) and an increased ambulance bypass pathway to the nearest hospital providing a 24/7 thrombolysis service in some areas. While there was an increase in the number of stroke unit beds, from 150 to 239 (NOCA, 2022b), the majority of hospitals did not have enough stroke unit beds to meet the national standard that 90% of stroke patients should be admitted to a stroke unit. Eighty-eight percent of stroke units were operating below the recommended nurse staffing level, and there were wide gaps in health and social care professional staffing levels compared with the recommended numbers of staff needed.

The NCP for Stroke described this as a wholly unacceptable situation, and in 2022 it published the *National Stroke Strategy 2022-2027* (NSS) (HSE, 2022), the full implementation of which is a recommendation in the *Irish National Audit of Stroke National Report 2023* (NOCA, 2025).

## PURPOSE OF THIS REPORT

The purpose of this report is to audit clinical care and organisation of stroke services in hospitals that provide acute stroke services against the recommendations in the following publications:

1. *National Clinical Guideline for Stroke for the United Kingdom and Ireland* (Intercollegiate Stroke Working Party, 2023)
2. *National Stroke Strategy 2022-2027* (HSE, 2022)
3. *Stroke Clinical Care Programme: Model of Care* (HSE, 2012)
4. European Stroke Organisation recommendations to establish a stroke unit and stroke center (Ringelstein *et al.,* 2013).

All data from the INAS Organisational Audit survey are reported at national level within the report, and key items are reported at hospital level. All data are reported at hospital and national level in the INAS Organisational Audit National Reporting Table.

Throughout the report, results from the 2024 clinical audit are presented in order to demonstrate how the organisation of stroke services can impact on patient experience. In addition, Chapter 8 presents the key findings from the INAS clinical audit for 2024, including the seven key quality indicators (KQIs) of stroke care as monitored by the INAS. All of this will be supplemented with the INAS National Reporting Table 2024.

The findings from both the organisational and clinical audits inform the recommendations presented in Chapter 11.



# 2. METHODS

# 2. METHODS

## INAS ORGANISATIONAL AUDIT



An organisational audit survey (Appendix 1) was developed based on learnings from the survey completed in 2021 (NOCA, 2022b), with some modifications based on updated recommendations and guidelines since 2021. The questionnaire was endorsed by the INAS Governance Committee (Appendix 2). SurveyMonkey was used as the platform to carry out the survey, and logic and validations were built in in order to minimise errors at the point of entry. The survey was piloted in two hospitals, and the questionnaire was adjusted slightly following the pilot.

## RECRUITMENT AND DATA COLLECTION



A hospital was considered eligible to participate in the survey if it provided acute stroke services in 2025. In 2025, 24 hospitals fulfilled this criterion, and all 24 hospitals are reported on within this report. The survey was disseminated via email to each hospital on 5 March 2025, with a request to have the survey returned within 1 month. The clinical teams submitted the data following agreement by the hospital manager/chief executive officer.

## DATA ANALYSIS



The analysis was conducted using Statistical Package for the Social Sciences (SPSS) V25. A multidisciplinary writing group recruited from members of the INAS Governance Committee was established to write this report. The NOCA Data Analyst completed descriptive statistical analysis in conjunction with the INAS Audit Manager.

## INAS CLINICAL AUDIT



All patients with ischaemic and haemorrhagic stroke who were treated in public hospitals that provide acute stroke care, that have 80% or more coverage, and that admitted more than 25 patients with a stroke annually over the reporting period, are included in this audit. Appendix 3 provides further information related to the INAS methodology.

## REPORTING PERIOD



Patients with a stroke who were discharged between 1 January 2024 and 31 December 2024 are included in the INAS clinical audit.

## DATA ANALYSIS



NOCA received the full stroke audit portal data extract for 2024 from the Healthcare Pricing Office (HPO) in April 2025. The NOCA Data Analyst completed the analysis following data checks with the HPO. The analysis was conducted using SPSS V29. The metadata for composite variables are available in Appendix 4. Frequency tables are available in Appendix 7.


Coverage of Data Release
Completeness of Data Release
Accuracy of Data Release
3. DATA QUALITY

# 3. DATA QUALITY

Tables 3.1, 3.2 and 3.3 provide an assessment of the quality of the INAS Organisational Audit Survey 2025 and the INAS Clinical Audit 2024 in this report using internationally agreed dimensions of data quality (Health Information and Quality Authority, 2018). A full data quality assessment of the INAS is available in Appendix 6.

**TABLE 3.1:** CONTEXT OF DATA QUALITY STATEMENT

| | |
|---|---|
| **SCOPE** | This data quality statement provides an assessment of the data released for this report. This statement solely focuses on the data quality dimension of accuracy and reliability, and specifically on the characteristics of:<br>• coverage of data release<br>• completeness of data release<br>• accuracy of data release. |
| **PURPOSE** | This data quality statement will help the user decide whether the data are fit for the user's specific purpose. |
| **DATA SOURCE** | Sources of data for this report are:<br>• data submitted via the INAS Organisational Audit Survey 2025<br>• data extracted from the Hospital In-Patient Enquiry (HIPE) system, which includes data submitted to the stroke audit portal within HIPE. |
| **TIME FRAME OF DATA RELEASE** | Data released in this report are based on:<br>• INAS Organisational Audit 2025 survey data, which were collected in March 2025<br>• INAS Clinical Audit data, which were reported between 1 January 2024 and 31 December 2024. |
| **TYPE OF DATA** | Final |

**TABLE 3.2:** CHARACTERISTICS OF DATA QUALITY

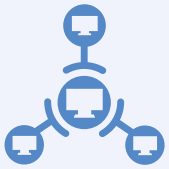
| | | |
|---|---|---|
|  | **COVERAGE OF DATA RELEASE** | All 24 hospitals eligible to participate in the INAS Organisational Audit Survey 2025 are included in this report.<br><br>Coverage for the INAS Clinical Audit was defined as the proportion of cases with either a principal diagnosis or a hospital acquired diagnosis (HADx)[1] of stroke that had additional clinical data submitted to the stroke audit portal (Table 3.4). The coverage target is set at 80%, and the higher the coverage level the better, as this will better reflect usual stroke care. All 24 participating hospitals had a greater than 80% coverage rate, resulting in a national coverage rate of 95% (Table 3.4). |
|  | **COMPLETENESS OF DATA RELEASE** | The INAS Organisational Audit Survey 2025 contained mandatory fields, which minimised the risk of missing or incomplete data. Overall, the completeness of the data was high, with only one question recording a response rate below 90%.<br><br>Within the INAS Clinical Audit, 53 variables were analysed for completeness, and 48 had a completeness rate of more than 90% (see the INAS National Reporting Table 2024 for completeness of all variables, by hospital). Variables related to the onset of stroke symptoms have the highest level of missing data. |
|  | **ACCURACY OF DATA RELEASE** | Each hospital's survey was reviewed by the INAS Audit Manager; any obvious omissions or clarifications were directed back to the clinical teams, and the Excel file was amended accordingly.<br><br>All records are included in the analysis, including those where data are missing and/or unknown for some data fields. |

**TABLE 3.3:** OVERALL ASSESSMENT OF THE QUALITY OF THE DATA IN THIS REPORT

| | |
|---|---|
| **STRENGTHS OF DATA IN THIS REPORT** | This report provides an overview of the organisation of stroke services in all hospitals providing acute stroke services in Ireland in 2025. It audits against the latest recommendations and guidance available nationally and in Europe, and identifies areas for further quality improvement.<br><br>This report also presents the trends in the seven KQIs of stroke care. |
| **LIMITATIONS OF DATA IN THIS REPORT** | As with previous reports, INAS data reflect care in the acute hospital and do not follow the patient along their complete pathway to recovery. |

[1] HADx is defined within HIPE as a condition that arises during the episode of admitted patient care that would not have been present or suspected on admission (HPO, 2022).

**TABLE 3.4:** COVERAGE OF PRINCIPAL DIAGNOSIS AND HOSPITAL ACQUIRED DIAGNOSIS FOR HOSPITAL IN-PATIENT ENQUIRY SCHEME STROKE CASES WITH IRISH NATIONAL AUDIT OF STROKE DATA

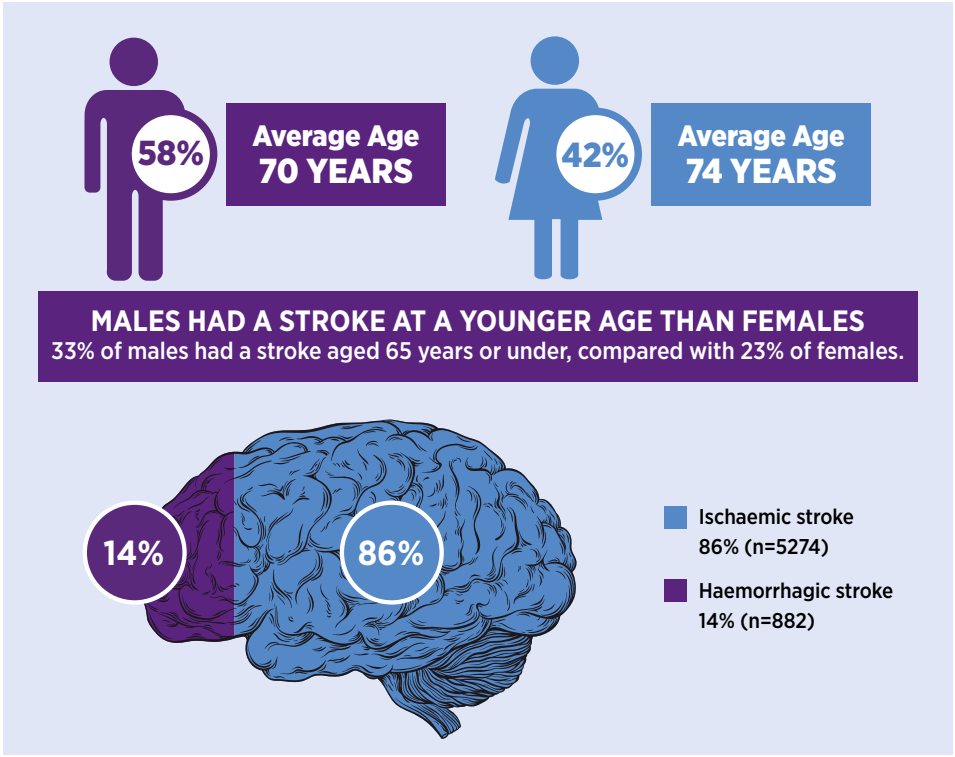
| Regional Health Area | Hopsital | Number of INAS cases | Number of HIPE cases | Coverage | Number of cases after considering inclusion/ exclusion criteria |
|---|---|---|---|---|---|
| HSE Dublin and Midlands | Naas General Hospital | 180 | 191 | 94.2% | 175 |
| | Regional Hospital Mullingar | 167 | 181 | 92.3% | 158 |
| | St James's Hospital | 301 | 309 | 97.4% | 274 |
| | Tallaght University Hospital | 388 | 409 | 94.9% | 369 |
| HSE Dublin and North East | Connolly Hospital | 299 | 299 | 100.0% | 283 |
| | Cavan General Hospital | 157 | 161 | 97.5% | 153 |
| | Mater Misericordiae University Hospital | 345 | 389 | 88.7% | 321 |
| | Our Lady of Lourdes Hospital Drogheda | 309 | 313 | 98.7% | 295 |
| | Beaumont Hospital | 601 | 601 | 100.0% | 578 |
| HSE Dublin and South East | University Hospital Waterford | 193 | 212 | 91.0% | 165 |
| | St Luke's General Hospital, Carlow/Kilkenny | 192 | 194 | 99.0% | 188 |
| | Wexford General Hospital | 184 | 184 | 100.0% | 182 |
| | Tipperary University Hospital | 159 | 163 | 97.5% | 159 |
| | St Vincent's University Hospital | 402 | 439 | 91.6% | 390 |
| HSE Mid West | University Hospital Limerick | 447 | 531 | 84.2% | 434 |
| HSE South West | Bantry General Hospital | 68 | 68 | 100.0% | 67 |
| | Cork University Hospital | 739 | 739 | 100.0% | 635 |
| | University Hospital Kerry | 250 | 261 | 95.8% | 237 |
| | Mercy University Hospital | 78 | 92 | 84.8% | 73 |
| HSE West and North West | Letterkenny University Hospital | 201 | 201 | 100.0% | 185 |
| | Sligo University Hospital | 241 | 265 | 90.9% | 234 |
| | University Hospital Galway | 368 | 374 | 98.4% | 342 |
| | Mayo University Hospital | 195 | 238 | 81.9% | 193 |
| | Portiuncula University Hospital | 68 | 68 | 100.0% | 66 |
| **TOTAL** | | **6532** | **6882** | **94.9%** | **6156** |

# 4. IRISH NATIONAL AUDIT OF STROKE CLINICAL AUDIT 2024 KEY FINDINGS



# 4. IRISH NATIONAL AUDIT OF STROKE CLINICAL AUDIT 2024 KEY FINDINGS

This chapter presents the key findings and trends identified from the analysis of the complete clinical audit dataset, as reported in the INAS National Reporting Table 2024. All results presented in this chapter can be found by hospital in the INAS National Reporting Table 2024. In 2024, 6,581 cases with a principal diagnosis of stroke were admitted to the 24 hospitals providing acute stroke care in Ireland. This report presents information on the care provided to 6,156 patients with a stroke who were admitted to all 24 hospitals and had additional Irish National Audit of Stroke (INAS) data submitted. Figure 4.1 illustrates the annual increase in hospital admissions for patients with a stroke.



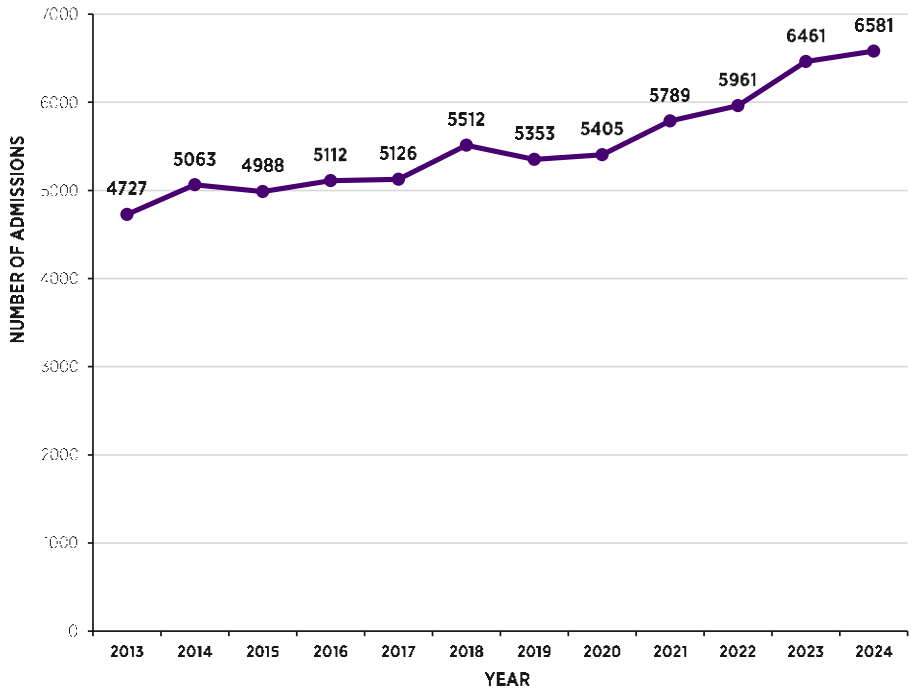




**FIGURE 4.1:** ANNUAL NUMBER OF HOSPITAL IN-PATIENT ENQUIRY STROKE ADMISSIONS IN ALL HOSPITALS PARTICIPATING IN THE IRISH NATIONAL AUDIT OF STROKE, BY YEAR

## EMERGENCY CARE

In 2024, the median time from onset of stroke symptoms to hospital arrival was 3 hours and 28 minutes. Only 57% (n=1956) arrived at hospital within 4.5 hours of stroke symptom onset. When a patient with a stroke arrives at the hospital, the stroke protocol clock starts immediately. This activates a multidisciplinary process to ensure rapid clinical assessment, neuroimaging and initiation of appropriate treatment. Every minute of delay can result in significant loss of brain tissue, so timely coordination between emergency, radiology and stroke teams is essential in order to optimise outcomes. Table 4.1 presents the 2021–2024 trends for the three timestamps recorded to monitor timely treatment of patients with a stroke with thrombolysis and thrombectomy. While the rates of both thrombolysis and thrombectomy have not changed substantially, the actual number of patients who received these acute interventions has increased since 2021: thrombolysis has increased by 23%, and thrombectomy has increased by 18%. The results for 2024 are presented by hospital in the INAS National Reporting Table 2024.

**TABLE 4.1:** EMERGENCY CARE QUALITY INDICATORS, BY YEAR

| EMERGENCY CARE QUALITY INDICATORS | GOAL | 2021[2] | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|
| Time from hospital arrival to medical team review | Within 10 minutes | 48% | 48% | 52% | 53% |
| Time from hospital arrival to brain imaging | Within 60 minutes | 48% | 49% | 51% | 50% |
| Proportion of ischaemic cases that received thrombolysis | 12% | 10% (n=432) | 11% (n=468) | 11% (n=550) | 11% (n=531) |
| Time from hospital arrival to thrombolysis | Within 60 minutes | 56% | 54% | 57% | 52% |
| Proportion of ischaemic cases that received thrombectomy[3] | N/A | 10% (n=422) | 9% (n=416) | 11% (n=539) | 10% (n=497) |

## STROKE UNIT CARE

Stroke unit care is the one intervention proven to provide a broad and consistent benefit to all patients with a stroke across the spectrum of stroke types and severities, making it a crucial service for stroke management. Table 4.2 presents the trends related to stroke unit access and treatment from 2021 to 2024. While the percentage of patients with a stroke who are admitted to a stroke unit has improved slightly since 2021, it remains consistently around 70%. However, the actual number of patients admitted to a stroke unit has increased by 21% (2021: n=3658; 2024: n=4494). The stroke unit care quality indicators for 2024 are presented by hospital in the INAS National Reporting Table 2024.

**TABLE 4.2:** STROKE UNIT CARE QUALITY INDICATORS, BY YEAR

| STROKE UNIT CARE QUALITY INDICATORS | GOAL | 2021[4] | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|
| Proportion of patients admitted to a stroke unit | 90% | 70% | 68% | 70% | 73% |
| Proportion of hospital stay spent in a stroke unit | 90% | 68% | 67% | 69% | 69% |
| Proportion of patients who received a swallow screen | 90% | 68% | 70% | 75% | 81% |
| Proportion of patients who received a swallow screen within 4 hours | 90% | 43% | 43% | 44% | 23%[5] |
| Proportion of patients who were prescribed new or altered antithrombotic therapy on the same day or the next day | N/A | 89% | 84% | 86% | 83% |
| Proportion of patients with atrial fibrillation (AF) who were prescribed anticoagulants for secondary prevention of stroke | N/A | 84% | 84% | 85% | 91% |

[2] 2021 data may not be fully comparable to data of 2022–2024 due to a small change in methodology. See the Chapter 2 for more details.
[3] There was no agreed target or goal at time of writing this report.
[4] 2021 data may not be fully comparable to data of 2022–2024 due to a small change in methodology. See Chapter 2 for more details.
[5] A change to the data element used for calculating swallow screening within 4 hours was implemented in 2024, which contributed to the observed decline in results.

## MDT ACTIVITY

Ensuring timely access to the appropriate stroke therapy specialists is essential for delivering high-quality stroke care and optimising patient outcomes throughout the stroke care pathway. A meta-review of stroke rehabilitation found that the amount of therapy time a patient underwent, regardless of the specific type, was a key factor in reducing their activity limitations and facilitating recovery (Clark *et al.*, 2021). The INAS health and social care professional (HSCP) dataset currently includes discipline-specific information in addition to physiotherapy, occupational therapy, and speech and language therapy only. Table 4.3 presents the trends related to HSCP activity from 2022 to 2024. This information is unavailable for 2021. MDT quality indicators for 2024 are presented by hospital in the INAS National Reporting Table 2024.

**TABLE 4.3:** HSCP ACTIVITY, BY YEAR

| MDT QUALITY INDICATORS | 2022 | 2023 | 2024 |
|---|---|---|---|
| Proportion of patients assessed by a stroke nurse specialist | 85% | 86% | 88% |
| Proportion of patients referred to physiotherapy | 93% | 94% | 93% |
| Proportion of patient referred to physiotherapy with additional HSCP data | 46% | 45% | 49% |
| Proportion of patients whose PTs reported that they had received enough therapy | 50% | 47% | 50% |
| Proportion of patients referred to occupational therapy | 88% | 90% | 90% |
| Proportion of patient referred to occupational therapy with additional HSCP data | 42% | 40% | 39% |
| Proportion of patients for whose OTs reported that they had received enough therapy | 40% | 42% | 50% |
| Proportion of patients referred to speech and language therapy | 70% | 67% | 67% |
| Proportion of patients referred to speech and language therapy with additional HSCP data | 45% | 41% | 45% |
| Proportion of patients whose SLTs reported that they had received enough therapy | 49% | 53% | 57% |
| Proportion of patients assessed by a dietitian | 33% | 31% | 29% |
| Proportion of patients assessed by an MSW | 26% | 26% | 24% |
| Proportion of patients assessed by a psychologist | 7% | 6% | 5% |

## OUTCOMES

The outcomes reported by the INAS reflect the outcomes at a patient's discharge from the acute hospital and do not reflect outcomes at the end of the patient journey (i.e. they do not take into account scenarios such as in-hospital rehabilitation or patients being transferred to another acute hospital). Discharge to long-term care and in-hospital mortality has remained generally stable over the 3 reporting years. In 2026, the INAS dataset will include some additional information on the initial treatment for patients with haemorrhagic stroke, enabling more depth in future reporting. Table 4.4 presents the outcome quality indicators from 2021 to 2024. Outcome quality indicators for 2024 are presented by hospital in the INAS National Reporting Table 2024.

**TABLE 4.4:** OUTCOME QUALITY INDICATORS, BY YEAR

| OUTCOME QUALITY INDICATORS | 2021[6] | 2022 | 2023 | 2024 |
|---|---|---|---|---|
| Length of stay in acute hospital (average number of days) | 15 | 19 | 18 | 17 |
| Length of stay in a stroke unit (average number of days) | 11 | 14 | 14 | 13 |
| Proportion of patients discharged home[7] | 50% | 50% | 48% | 46% |
| Proportion of patients discharged home with ESD | 10% | 10% | 9% | 11% |
| Proportion of patients discharged home with a mild disability | 31% | 32% | 31% | 34% |
| Proportion of patients discharged home with a moderate to severe disability | 34% | 34% | 35% | 35% |
| Proportion of patients discharged to long-term care | 6% | 7% | 7% | 7% |
| Unadjusted in-hospital mortality – all stroke types[8] | 12% | 11% | 10% | 11% |
| Unadjusted in-hospital mortality – ischaemic stroke[9] | 7% | 8% | 7% | 8% |
| Unadjusted in-hospital mortality – haemorrhagic stroke[10] | 28% | 30% | 29% | 31% |

[6] 2021 data may not be fully comparable to data of 2022–2024 due to a small change in methodology. See Chapter 2 for more details.
[7] This may not reflect a disimprovement, rather an impact from the increase in the number of patients discharged home with ESD.
[8] Based on modified Rankin Scale (mRS) scores
[9] Based on mRS scores
[10] Based on mRS scores



# 5. ORGANISATION OF ACUTE HOSPITAL STROKE SERVICES

# 5. ORGANISATION OF ACUTE HOSPITAL STROKE SERVICES

## HOSPITAL ORGANISATION OF STROKE SERVICES

In total, there were 9,891 inpatient beds across the 24 participating hospitals, which is an increase of 294 beds from 2021 (n=9597). All hospitals reported that they have a stroke unit, and two hospitals – Mater Misericordiae University Hospital and Tallaght University Hospital – have stroke units that are accredited by the European Stroke Organisation (ESO). Beaumont Hospital (an ESO-accredited stroke centre) and Cork University Hospital also provide an endovascular thrombectomy (EVT) service 24 hours a day, 7 days a week.

HIPE admission stroke activity has changed since 2021. In total, there has been a 13% increase in stroke admissions,[11] from 6,089 in 2021 to 6,882 in 2024. The difference was greater in some hospitals, with 12 (50%) admitting at least 13% more patients with a stroke compared with how many they admitted in 2021 (Table 5.1). St Luke's General Hospital Carlow/Kilkenny and University Hospital Kerry have seen an increase of 46% and 58%, respectively. The clinical team in University Hospital Kerry commented that there has been a real increase in presentations, stating that "[University Hospital Kerry] has seen a 27% increase in over-75s presenting to [the emergency department] since 2023. It's also probable our ascertainment has improved through our service as we get a lot of consults". The team in St Luke's General Hospital Carlow/Kilkenny commented that they have "experienced a substantial increase in those with stroke requiring our services, including urgent assessment, inpatient care, rehabilitation and investigation. The increase is a result of population growth, increased numbers of strokes among migrants, and to St Luke's continued to support patients from surrounding areas where urgent stroke services are not available". Seven hospitals (29%) have seen a decrease in admissions, although the decreases are small (Table 5.1). Almost all hospitals (n=23) run an emergency department (ED) and an intensive care unit (ICU) except Bantry General Hospital, which operates a medical assessment unit 24 hours a day, 7 days a week.

## DEFINING STROKE

Stroke can be defined according to two classifications:

1. **World Health Organization (WHO) definition:** Rapidly developing clinical signs of focal (or global) disturbance of cerebral function, lasting more than 24 hours or leading to death, with no apparent cause other than that of vascular origin.
2. **American Heart Association (AHA)/American Stroke Association (ASA) definition:** Infarction based on pathological, imaging or other objective evidence of infarction. In the absence of this evidence, the persistence of symptoms for at least 24 hours or until death remained a method to define ischaemic stroke.

How stroke is defined can impact case mix, thus impacting activity reports, audit results and outcomes. The AHA/ASA definition permits inclusion of patients with transient or even absent neurological deficits and would tend to result in the inclusion of a large number of patients with milder strokes and with short lengths of stay. It also means that hospitals with easier access to advanced imaging may diagnose more strokes, which may not fairly represent relative activity. However, such patients may also benefit from the organised care and evaluation that they would receive while being cared for in a stroke service. This report indicates a similar ratio of stroke definition to that in 2021, with 14 hospitals (58%) reporting that they use the AHA/ASA definition of stroke and 10 (42%) reporting that they use the WHO definition; however, more than one-half (n=13) of participating hospitals define stroke differently compared with how they did in 2021. These results suggest that the diagnosis of a stroke is made using both definitions, and possibly on a case-by-case basis. In some cases, this may be appropriate (e.g. it may be clinically appropriate not to perform magnetic resonance imaging (MRI) on a patient with dementia); however, national agreement on how stroke should be classified is recommended.

[11] Includes all cases with a principal diagnosis of stroke or a HADx of stroke that were admitted to hospitals participating in the INAS, excluding cases that were transferred to an EVT centre and transferred back to the referring hospital on the same day.

**TABLE 5.1:** NUMBER OF BEDS, STROKE UNIT PROVISION, DEFINITION OF STROKE, AND HOSPITAL IN-PATIENT ENQUIRY ADMISSIONS, BY HOSPITAL

| Regional Health Area | Hopsital (N=24) | Number of hospital beds | Stroke unit provision (N=24) | Definition of stroke | Number of stroke admissions in 2021 recorded in HIPE | Number of stroke admissions in 2024 recorded in HIPE | Proportion difference in stroke admissions between 2021 and 2024 |
|---|---|---|---|---|---|---|---|
| HSE Dublin and Midlands | Naas General Hospital | 220 | ✔ | AHA/ASA* | 207 | 191 | −8% |
| | Regional Hospital Mullingar | 115 | ✔ | AHA/ASA | 184 | 181 | −2% |
| | St James's Hospital | 1066 | ✔ | AHA/ASA* | 280 | 309 | 10% |
| | Tallaght University Hospital | 474 | ✔ | AHA/ASA | 327 | 409 | 25% |
| HSE Dublin and North East | Beaumont Hospital | 851 | ✔ | AHA/ASA | 528 | 601 | 14% |
| | Cavan General Hospital | 242 | ✔ | AHA/ASA* | 179 | 161 | −10% |
| | Connolly Hospital | 364 | ✔ | WHO** | 252 | 299 | 19% |
| | Mater Misericordiae University Hospital | 755 | ✔ | AHA/ASA | 346 | 389 | 12% |
| | Our Lady of Lourdes Hospital Drogheda | 348 | ✔ | AHA/ASA | 300 | 313 | 4% |
| HSE Dublin and South East | St Luke's General Hospital, Carlow/Kilkenny | 294 | ✔ | WHO** | 133 | 194 | 46% |
| | St Vincent's University Hospital | 588 | ✔ | WHO** | 506 | 439 | −13% |
| | Tipperary University Hospital | 256 | ✔ | AHA/ASA | 126 | 163 | 29% |
| | University Hospital Waterford | 386 | ✔ | WHO | 184 | 212 | 15% |
| | Wexford General Hospital | 222 | ✔ | WHO** | 179 | 184 | 3% |
| HSE Mid West | University Hospital Limerick | 537 | ✔ | AHA/ASA | 398 | 531 | 33% |
| HSE South West | Bantry General Hospital | 64 | ✔ | WHO | 85 | 68 | −20% |
| | Cork University Hospital | 750 | ✔ | AHA/ASA* | 609 | 739 | 21% |
| | Mercy University Hospital | 218 | ✔ | AHA/ASA* | 116 | 92 | −21% |
| | University Hospital Kerry | 377 | ✔ | WHO** | 165 | 261 | 58% |
| HSE West and North West | Letterkenny University Hospital | 378 | ✔ | AHA/ASA* | 204 | 201 | −1% |
| | Mayo University Hospital | 250 | ✔ | WHO** | 172 | 238 | 38% |
| | Portiuncula University Hospital | 220 | ✔ | WHO | 54 | 68 | 26% |
| | Sligo University Hospital | 277 | ✔ | WHO | 237 | 265 | 12% |
| | University Hospital Galway | 639 | ✔ | AHA/ASA* | 318 | 374 | 18% |
| **TOTAL** | | **9891** | **100%** | | **6089** | **6882** | **13%** |

** Reported as WHO in 2021*
*** Reported as AHA/ASA in 2021*

# STROKE SERVICE GOVERNANCE

**GUIDELINE:** Stroke services should develop a culture of continuous quality improvement, and attention to good governance is mandatory. Clinicians providing care for people with a stroke should participate in national stroke audit in order to enable comparison of the clinical and organisational quality of their services, and use the findings to plan and deliver service improvements (Intercollegiate Stroke Working Party, 2023).

Twenty-one participating hospitals have clinical audit committees; however, only 11 discuss data from the INAS reports during meetings. Nineteen participating hospitals (79%) reported that they have a stroke governance committee, which is a decrease from 20 in 2021. Of these, 16 meet at least quarterly, and the INAS reports form part of the agenda in all 19 hospitals (Table 5.2). Membership is multidisciplinary, and most committees include a stroke consultant, senior nursing representative and senior health and social care professional (HSCP) representative, although only nine have a quality manager represented (Figure 5.1).

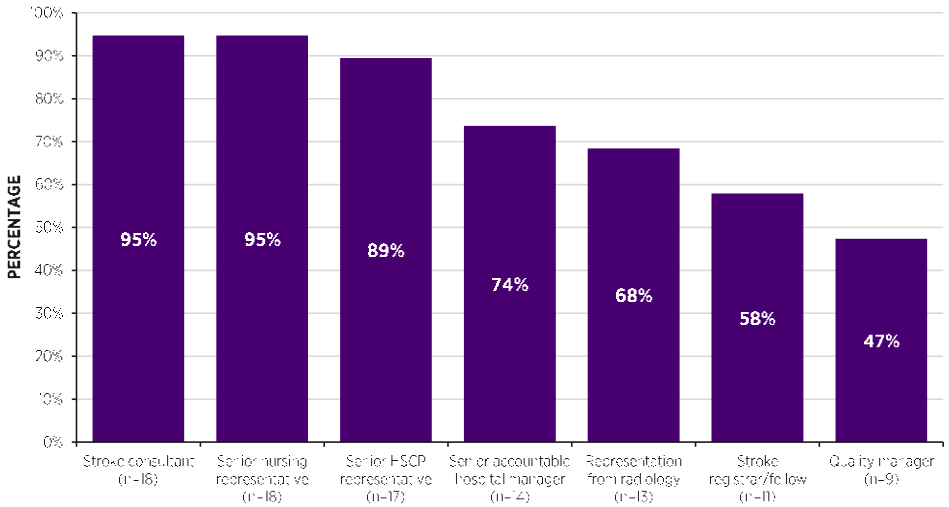



**FIGURE 5.1:** MEMBERSHIP OF HOSPITAL STROKE GOVERNANCE COMMITTEES (n=19)

**TABLE 5.2:** HOSPITAL STROKE GOVERNANCE COMMITTEES

| Regional Health Area | Hopsital (N=24) | Stroke governance committee (n=19) | INAS reports form part of the agenda (n=19) | Frequency of meetings |
|---|---|---|---|---|
| HSE Dublin and Midlands | Naas General Hospital | ✔ | ✔ | Quarterly |
| | Regional Hospital Mullingar | ✔ | ✔ | Twice annually |
| | St James's Hospital | ✔ | ✔ | Quarterly |
| | Tallaght University Hospital | ✔ | ✔ | Quarterly |
| HSE Dublin and North East | Beaumont Hospital | ✔ | ✔ | Quarterly |
| | Cavan General Hospital | ✔ | ✔ | Quarterly |
| | Connolly Hospital | ✔ | ✔ | Twice annually |
| | Mater Misericordiae University Hospital | N/A | N/A | N/A |
| | Our Lady of Lourdes Hospital Drogheda | ✔ | ✔ | Quarterly |
| HSE Dublin and South East | St Luke's General Hospital, Carlow/Kilkenny | ✔ | ✔ | Monthly |
| | St Vincent's University Hospital | ✔ | ✔ | Quarterly |
| | Tipperary University Hospital | ✔ | ✔ | Quarterly |
| | University Hospital Waterford | ✔ | ✔ | Quarterly |
| | Wexford General Hospital | ✔ | ✔ | Quarterly |
| HSE Mid West | University Hospital Limerick | ✔ | ✔ | Quarterly |
| HSE South West | Bantry General Hospital | N/A | N/A | N/A |
| | Cork University Hospital | ✔ | ✔ | Monthly |
| | Mercy University Hospital | ✔ | ✔ | Quarterly |
| | University Hospital Kerry | ✔ | ✔ | Quarterly |
| HSE West and North West | Letterkenny University Hospital | N/A | N/A | N/A |
| | Mayo University Hospital | N/A | N/A | N/A |
| | Portiuncula University Hospital | N/A | N/A | N/A |
| | Sligo University Hospital | ✔ | ✔ | Quarterly |
| | University Hospital Galway | ✔ | ✔ | Twice annually |

# ORGANISATION OF EMERGENCY STROKE CARE

**GUIDELINE:** Acute stroke services should have management protocols for the admission pathway, including links with the ambulance service, emergency stroke treatments and acute imaging (Intercollegiate Stroke Working Party, 2023).

## Ambulance service pre-alert

Twenty-two participating hospitals (92%)[12] reported that they receive an ambulance service pre-alert for all FAST (Face, Arms, Speech, Time) calls, which is an increase from 17 hospitals in 2021. Ten hospitals (42%)[13] receive a pre-alert for patients considered eligible for thrombolysis only. If the hospital receives a pre-alert, the call is usually made directly to the ED (n=19; 79%).

## On-call medical availability

Eleven participating hospitals (46%) have on-call stroke teams available 24 hours a day, 7 days a week; 6 (25%) have on-call stroke teams available Monday–Friday, 9.00am–5.00pm; and 7 (29%) do not have on-call stroke teams (Table 5.3). This situation remains relatively unchanged from 2021 (NOCA, 2022b).

In more than one-half of the hospitals (n=13), the stroke patient is normally first seen by an ED nurse, and in most hospitals (n=22; 92%) assessment happens in the ED, unchanged from 2021.

**TABLE 5.3:** AVAILABILITY OF ON-CALL STROKE TEAMS, BY HOSPITAL

| Regional Health Area | Hopsital (N=24) | Stroke team on call | Pre-alert from the ambulance service | | Stroke patient normally first seen by | Location of an assessment |
|---|---|---|---|---|---|---|
| | | | Thrombolysis candidates only | All FAST-positive cases | | |
| HSE Dublin and Midlands | Naas General Hospital | Mon–Fri, 9am-5pm | No | No | ED nurse | ED |
| | Regional Hospital Mullingar | 24/7 | Yes | Yes | Stroke non-consultant hospital doctor (NCHD) | ED |
| | St James's Hospital | 24/7 | No | Yes | ED nurse | ED |
| | Tallaght University Hospital | 24/7 | No | Yes | ED nurse | ED |
| HSE Dublin and North East | Beaumont Hospital | 24/7 | No | Sometimes | Stroke NCHD | ED |
| | Cavan General Hospital | Mon–Fri, 9am-5pm | Yes | Yes | ED nurse | ED |
| | Connolly Hospital | 24/7 | Yes | Yes | ED NCHD | ED |
| | Mater Misericordiae University Hospital | 24/7 | Yes | Yes | Stroke NCHD | ED |
| | Our Lady of Lourdes Hospital Drogheda | Mon–Fri, 9am-5pm | Sometimes | Sometimes | ED nurse | ED |
| HSE Dublin and South East | St Luke's General Hospital, Carlow/Kilkenny | 24/7 | Sometimes | Yes | Stroke nurse specialist | Acute medical admission ward |
| | Tipperary University Hospital | No | Yes | Yes | ED nurse | ED |
| | Wexford General Hospital | No | No | Yes | ED nurse | ED |
| | St Vincent's University Hospital | Mon–Fri, 9am-5pm | N/A | N/A | ED nurse | ED |
| | University Hospital Waterford | Mon–Fri, 9am-5pm | N/A | Yes | Stroke NCHD | ED |
| HSE Mid West | University Hospital Limerick | 24/7 | Sometimes | Yes | ED NCHD | ED |
| HSE South West | Bantry General Hospital | No | No | Yes | Stroke consultant | Radiology department/ Computed tomography (CT) scan |
| | Cork University Hospital | 24/7 | Yes | Yes | Stroke nurse specialist | ED |
| | Mercy University Hospital | 24/7 | Yes | Yes | ED nurse | ED |
| | University Hospital Kerry | Mon–Fri, 9am-5pm | N/A | Yes | ED nurse | ED |
| HSE West and North West | Mayo University Hospital | No | No | Sometimes | ED nurse | ED |
| | Portiuncula University Hospital | No | No | Sometimes | ED nurse | ED |
| | University Hospital Galway | 24/7 | No | Yes | Stroke NCHD | ED |
| | Letterkenny University Hospital | No | N/A | Yes | ED nurse | ED |
| | Sligo University Hospital | No | N/A | Yes | ED NCHD | ED |

[12] Includes a combination of answers: yes and sometimes.
[13] Includes a combination of answers: yes and sometimes.

# BRAIN IMAGING

**GUIDELINE:** Acute stroke services should have continuous (24/7) access to brain imaging, including CT or magnetic resonance angiography and perfusion when necessary, and should be capable of undertaking immediate brain imaging when clinically indicated (Intercollegiate Stroke Working Party, 2023).

As was the case in 2021, all hospitals reported that they have access to CT imaging for patients in the ED. Seventeen hospitals (71%) can routinely get a CT scan performed on all patients with a suspected stroke within 60 minutes of the request. Almost all (n=22) hospitals have access to multiphase CT angiography (CTA), which is an increase from 20 hospitals in 2021. Nine hospitals (38%) have access to computed tomography perfusion (CTP) for patients in the ED, which is an increase from five hospitals in 2021. CTP is an essential component of modern stroke care, enabling a tissue-based approach to the selection of patients for thrombolysis and thrombectomy beyond traditional time windows. The use of CTP must be underpinned by clear clinical protocols, appropriate training, automated imaging analysis and a strong governance framework to ensure patient safety, consistency of care and optimal outcomes. Twenty-three hospitals (96%) have an on-site on-call radiographer available to perform brain imaging, which is an increase from 16 hospitals in 2021, and 9 hospitals (38%) have an on-call radiologist available to perform brain imaging on-site, which is an increase from 3 hospitals in 2021. Ten hospitals (42%) use decision-making software (Table 5.4), which may increase the proportion of patients who receive thrombolysis. As of 2024, thrombolysis rates and timeliness of thrombolysis do not appear to be impacted by the availability of decision-making software. However, since 2021, changes in increased access to on-site radiographers and radiologists, do appear to have impacted on patient experience, e.g. there being an increased number of patients in 2024 receiving brain imaging within 60 minutes (n=2758; 50%) compared with 2021 (n=2341; 48%).



**CLINICAL IMPACT: PROPORTION OF PATIENTS WITH A STROKE WHO RECEIVE BRAIN IMAGING WITHIN 60 MINUTES OF HOSPITAL ADMISSION HAS INCREASED**

| 2021 | 48% | 2024 | 50% |
|---|---|---|---|

**TABLE 5.4:** ACCESS TO BRAIN IMAGING FOR PATIENTS IN THE EMERGENCY DEPARTMENT, BY HOSPITAL

| Regional Health Area | Hopsital (N=24) | Ability to routinely get a CT scan performed on all patients within 60 minutes of the request | Access to CTP for patients in the ED | Available to perform brain imaging, on call | | Hospital uses decision-making software | Key quality indicator (KQI) 3: Percentage of ischaemic stroke cases receiving thrombolysis | KQI 5: Median time between hospital arrival time and time of thrombolysis (minutes) |
|---|---|---|---|---|---|---|---|---|
| | | | | Radiologist | Radiographer | | % | Median (IQR1–IQR3) |
| HSE Dublin and Midlands | Naas General Hospital[14] | Always | No | Off-site | On-site | No | N/A | N/A |
| | Regional Hospital Mullingar | Always | Normal working hours only | On-site | On-site | Yes | 12% | 68 (55–87) |
| | St James's Hospital | Always | Yes, 24/7 | On-site | On-site | No | 9% | 60 (39–76) |
| | Tallaght University Hospital | Always | Normal working hours only | Off-site | On-site | Yes | 13% | 50 (42–78) |
| HSE Dublin and North East | Beaumont Hospital | Always | Yes, 24/7 | On-site | On-site | Yes | 12% | 41 (25–63) |
| | Cavan General Hospital | Always | No | On-site | On-site | Yes | 10% | 78 (49–91) |
| | Connolly Hospital | Usually | Yes, 24/7 | On-site | On-site | Yes | 7% | 60 (39–72) |
| | Mater Misericordiae University Hospital | Always | Yes, 24/7 | On-site | On-site | No | 17% | 39 (31–61) |
| | Our Lady of Lourdes Hospital Drogheda | Always | No | Off-site | On-site | No | 12% | 57 (43–70) |
| HSE Dublin and South East | St Luke's General Hospital, Carlow/Kilkenny | Usually | No | Off-site | On-site | No | 9% | 43 (38–60) |
| | St Vincent's University Hospital | Usually | No | Off-site | On-site | No | 9% | 55 (36–68) |
| | Tipperary University Hospital | Always | Yes, 24/7 | Off-site | On-site | Yes | 6% | 71 (37–91) |
| | University Hospital Waterford | Always | No | Off-site | On-site | Yes | 15% | 73 (65–95) |
| | Wexford General Hospital | Usually | No | Off-site | On-site | No | 12% | 65 (51–87) |
| HSE Mid West | University Hospital Limerick | Usually | Normal working hours only[15] | On-site | On-site | Yes | 12% | 77 (47–104) |
| HSE South West | Bantry General Hospital | Always | No | Off-site | On-site | No | 16% | 31 (15–60) |
| | Cork University Hospital | Always | Yes, 24/7 | On-site | On-site | Yes | 10% | 48 (32–71) |
| | Mercy University Hospital | Always | No | Off-site | On-site | No | 4% | 104 (100–155) |
| | University Hospital Kerry | Usually | No | Off-site | On-site | Yes | 7% | 68 (57–76) |
| HSE West and North West | Letterkenny University Hospital | Always | No | Off-site | On-site | No | 17% | 66 (42–102) |
| | Mayo University Hospital | Always | No | Off-site | On-site | No | 5% | 97 (69–135) |
| | Portiuncula University Hospital | Rarely | No | On-site | On-site | No | N/A | N/A |
| | Sligo University Hospital | Always | No | Off-site | On-site | No | 10% | 58 (42–70) |
| | University Hospital Galway | Always | No | Off-site | Off site | No | 14% | 48 (39–70) |

[14] Naas General Hospital and Portiuncula University Hospital did not provide an emergency stroke service in 2024.
[15] For patients amenable for thrombectomy only.

## INITIAL BRAIN IMAGING

Table 5.5 shows the initial acute brain imaging modality requested pertaining to the clinical presentation. CT was the most widely used brain imaging modality in cases where there is a clinical suspicion of stroke amenable to thrombolysis (n=23), followed by CTA (n=22). CTP was used in about one-quarter of hospitals. The INAS Organisational Audit National Reporting Table displays the initial acute brain imaging requested, by hospital.

**TABLE 5.5:** INITIAL ACUTE BRAIN IMAGING MODALITY

| | CT | | CTA | | CTP | |
|---|---|---|---|---|---|---|
| | N | % | N | % | N | % |
| Clinical suspicion of stroke amenable to thrombolysis | 23 | 96% | 22 | 92% | 6 | 25% |
| Clinical suspicion of stroke amenable to thrombolysis and possible thrombectomy | 23 | 96% | 23 | 96% | 6 | 25% |
| Clinical suspicion of stroke, but over 4.5 hours have passed since onset of symptoms | 24 | 100% | 23 | 96% | 7 | 29% |
| Clinical suspicion of posterior circulation stroke, but patient is not a thrombolysis candidate | 24 | 100% | 23 | 96% | 4 | 17% |
| Clinical suspicion of alternative neurological diagnosis | 23 | 96% | 7 | 29% | 2 | 8% |

## IMAGING REVIEW

During normal working hours, the medical professional responsible for the initial review of brain imaging to inform decisions about whether the patient receives thrombolysis and/or thrombectomy is generally either a stroke consultant (31%) or a general radiologist/neuroradiologist (55%) (Figure 5.2). Out of hours, general radiologists/neuroradiologists are responsible in most hospitals (66%), with stroke consultants available off-site, via telephone, in 19% of hospitals.

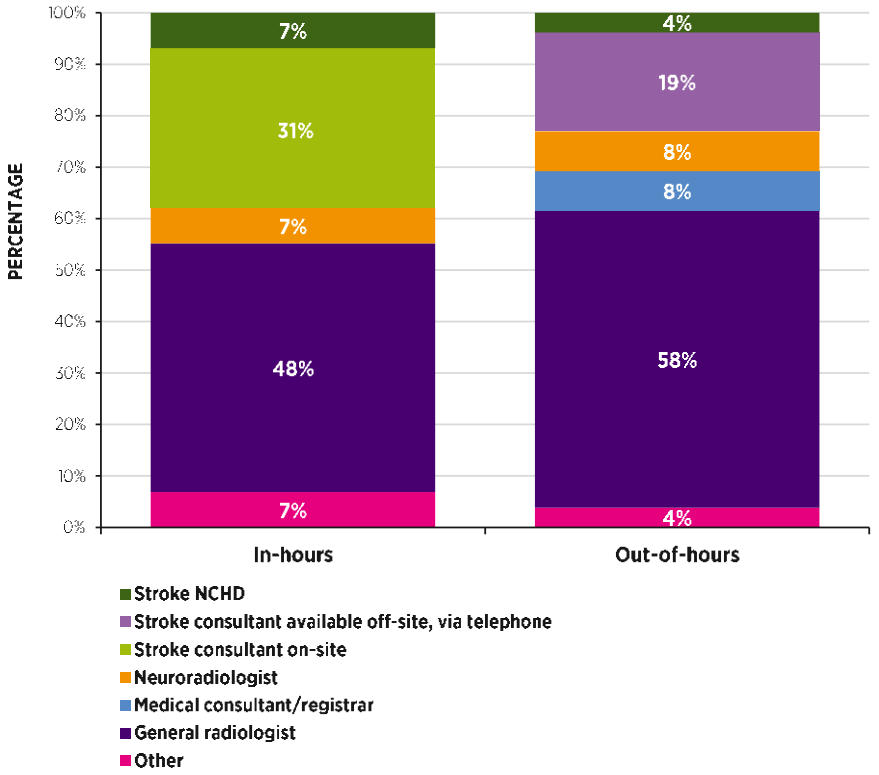



**FIGURE 5.2:** HEALTHCARE PROFESSIONAL RESPONSIBLE FOR THE INITIAL REVIEW OF BRAIN IMAGING TO INFORM DECISIONS ABOUT WHETHER THE PATIENT RECEIVES THROMBOLYSIS/THROMBECTOMY[16]

Hospitals reported that, in cases where patients did not have the initial brain scan reviewed by a radiologist, there was a process where the scans are reviewed by a radiologist at a later time. For patients with a large vessel occlusion, this process is available in 21 hospitals (88%)[17], 1 less than in 2021. For patients who received thrombolysis, this process is available in 18 (75%)[18] hospitals, unchanged from 2021.

[16] The category 'Other' included: reporting hub, ED consultant/registrar, stroke consultant at own hospital via telemedicine link, Stroke consultant in region/network via telemedicine, and assisted decision-making app.
[17] Options include: yes, always (n=13; 54%); yes, sometimes (n=7; 29%); yes, rarely (n=1; 4%).
[18] Options include: yes, always (n=8; 33%); yes, sometimes (n=8; 33%); yes, rarely (n=3; 13%).

## ORGANISATION OF THROMBOLYSIS SERVICES

**RECOMMENDATION:** Thrombolysis should only be administered within a well-organised stroke service with processes in place throughout the emergency pathway to minimise delays to treatment (Intercollegiate Stroke Working Party, 2023).

As in 2021, almost all hospitals (n=22; 96%) reported that they provide a thrombolysis service 24 hours a day, 7 days a week, however, the hospitals that provide this service have changed slightly.

Since 2021, Connolly Hospital now provides a thrombolysis service 24 hours a day, 7 days a week. In Naas General Hospital, since March 2023, all patients assessed and transported by paramedical/ambulance staff as FAST positive go directly to Tallaght University Hospital ED to facilitate assessment for thrombolysis and thrombectomy. They are either repatriated to Naas General Hospital ED on the same day or sent from Tallaght University Hospital stroke unit to Naas General Hospital stroke unit once they are stable. It should be noted that both walk-in and inpatient FAST-positive patients are assessed in Naas General Hospital, and thrombolysis can be administered under the guidance of the stroke consultant in Naas General Hospital (if occurring in-hours) or the stroke consultant on call in Tallaght University Hospital (if occurring out of hours).

For Portiuncula University Hospital, an ambulance bypass remains in place for transporting FAST-positive patients to Galway University Hospital.

All hospitals that provide a thrombolysis service have a thrombolysis decision protocol, which includes management of arising complications, based on national guidelines.

## ASSESSMENT OF PATIENTS AND TREATMENT WITH THROMBOLYSIS[19]

In one-half of hospitals (n=12; 52%) the stroke NCHD normally assesses the patient for thrombolysis, in five hospitals (22%) it is by the stroke consultant and in three hospitals (13%) it is by the stroke nurse specialist. The decision to proceed with thrombolysis is generally made at consultant level, either by a stroke consultant (n=15; 65%), medical consultant (n=6; 26%) or ED consultant (n=1; 4%). This remains relatively unchanged from 2021.

More than one-half of hospitals (n=15; 65%) typically use alteplase as the thrombolytic agent, and eight hospitals (35%) report using tenecteplase, or both alteplase and tenecteplase. In 14 hospitals (61%) thrombolysis is commenced in the ED, and in 9 hospitals (39%) it is commenced in the CT scanner, which is an increase from 8 hospitals in 2021.

In 14 hospitals (61%), patients who received thrombolysis were most likely to be admitted to a coronary care unit (CCU), high dependency unit (HDU) or intensive care unit (ICU) after ED; in 9 hospitals (39%), patients who received thrombolysis were most likely to be admitted to the stroke unit. In 18 hospitals (75%), patients who did not receive thrombolysis were most likely to be admitted to the stroke unit after ED.

Eighteen (75%) hospitals reported that patients with a stroke are always or usually transferred to the care of the stroke team/stroke consultant after admission.

Overall, changes in the organisation of thrombolysis services since 2021 are minimal. However, the availability in all hospitals which provide thrombolysis of thrombolysis decision protocols based on national guidelines, as well as the adoption of tenecteplase, may be having a positive impact for patients, as it has resulted in a slightly higher rate, compared with 2021, of hospitals being able to provide thrombolysis within the recommended time frame of 60 minutes from hospital arrival.




**CLINICAL IMPACT: PROPORTION OF PATIENTS WHO RECEIVE THROMBOLYSIS WITHIN 60 MINUTES OF HOSPITAL ARRIVAL HAS INCREASED**

| 2021 | 56% | 2024 | 57% |
|---|---|---|---|

[19] Cases from Naas General Hospital are included.

# ORGANISATION OF THROMBECTOMY SERVICES

**GUIDELINE:** People with an acute neurological presentation suspected to be a stroke should be admitted directly to a hyperacute stroke unit that cares predominantly for patients with stroke, with access to a designated thrombectomy centre 24 hours a day, 7 days a week for consideration of mechanical thrombectomy (Intercollegiate Stroke Working Party, 2023).

Two hospitals, Beaumont Hospital and Cork University Hospital are designated, 24 hours a day, 7 days a week, EVT centres and provide an EVT service to over 28 hospitals (National Thrombectomy Service, 2022). Twenty-one hospitals report that they refer to this service 24 hours a day, 7 days a week.[20]

# TRANSFER TO THE EVT CENTRE

Ten hospitals (48%), out of the 21 that refer to the EVT service, reported that during normal working hours the decision to transfer a patient for thrombectomy is made by the stroke consultant in the referring hospital, and in six hospitals (29%) the decision is made by a neuroradiologist at the EVT centre. Conversely, nine hospitals (45%) reported that during out-of-hours periods this decision is made by the stroke consultant, whereas in seven hospitals (35%) it is made by the interventional neuroradiologist at the EVT centre (Figure 5.3). In practice, both in-hours and out-of-hours, the decision to transfer a patient for thrombectomy is a joint decision and would always involve a conversation with an interventional neuroradiologist at the EVT centre.

In most hospitals (n=13; 62%), out of the 21 that refer to the EVT service, the process for the administration of intravenous thrombolysis prior to transfer for thrombectomy was to give the bolus before transfer with a doctor or a nurse. Five hospitals (24%) administered tenecteplase before transfer, and as such it was not necessary to manage an infusion during transfer.

Thirteen hospitals (62%) called the ambulance service to arrange transfer to the EVT centre as soon as the patient was accepted by the EVT centre. In the remaining hospitals (n=8; 38%), an increase from four hospitals in 2021, the paramedic crew are kept on standby and released as soon as the decision to transfer a patient to an EVT centre has been made. This protocol, known as PITSTOP (Protocol for Improving Times for STroke Patients), is a quality improvement (QI) initiative led by the National Ambulance Service and the National Thrombectomy Service in Beaumont Hospital.

All 21 hospitals made use of the National Ambulance Service's Emergency Inter-Hospital Transfer Policy (Protocol 37) when transferring patients for thrombectomy, and 18 hospitals (86%) reported that on more than 1 occasion they experienced delays longer than 30 minutes waiting for a Protocol 37 ambulance. Four (19%) out of 21 hospitals transferred patients to the EVT centre via helicopter, an increase from 7 in 2021.

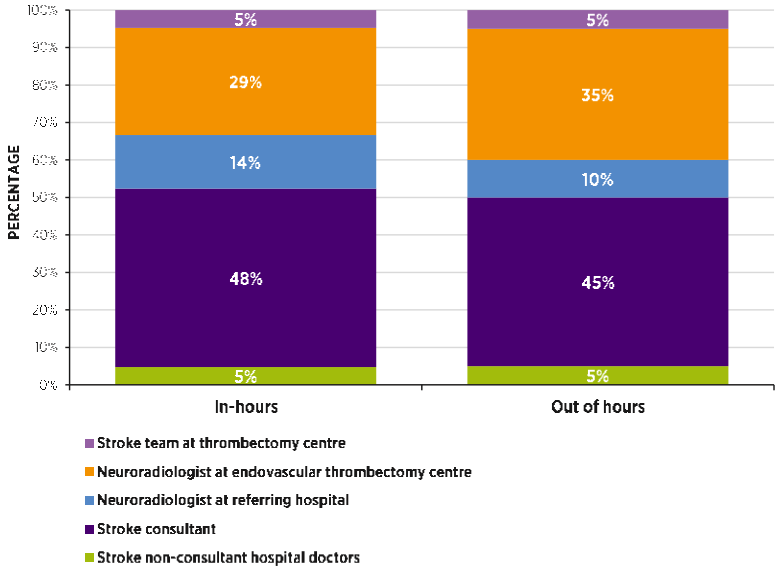



**FIGURE 5.3:** HEALTHCARE PROFESSIONAL WHO MAKES THE DECISION TO TRANSFER THE PATIENT FOR THROMBECTOMY

Eleven hospitals (52%) reported that most patients referred for thrombectomy are reviewed by the EVT centre as part of regional multidisciplinary team (MDT) meetings, an increase from eight in 2021. Findings suggest that there has been some change in the organisation of thrombectomy services at local level: for example, there has been an increase in the number of hospitals that wait to release the ambulance service until a decision is made to transfer a patient for thrombectomy, as well as an increase in follow-up reviews.



**CLINICAL IMPACT: PROPORTION OF PATIENTS WITH A STROKE WHO RECEIVE THROMBECTOMY**

| 2021 | 9.5% | 2024 | 9.7% |
|---|---|---|---|

[20] Two of the 24 participating hospitals are the EVT centres and one hospital has an ambulance bypass therefore does not refer to the EVT service.

## CHAPTER 5: KEY FINDINGS

- Nineteen hospitals (79%) reported that they have a stroke governance committee, a decrease from 20 in 2021.
- All hospitals reported having a dedicated stroke unit. Two hospitals, Mater Misericordiae University Hospital and Tallaght University Hospital, are accredited by the ESO as stroke units. Beaumont Hospital, which is accredited by the ESO as a stroke centre, and Cork University Hospital both provide a 24/7 EVT service.
- There has been a 13% increase in stroke admissions from 6,089 in 2021 to 6,882 in 2024. The difference was greater in some hospitals, with 12 (50%) seeing an increase of 13% or more of patients admitted since 2021 (Table 5.1).
- There is also variation in how hospitals define the diagnosis of stroke, with 58% (n=14) of hospitals reporting that they use the American Heart Association (AHA)/American Stroke Association (ASA) definition of stroke and 42% reporting that they use the World Health Organization (WHO) definition (Table 5.1).
- Twenty-two hospitals receive an ambulance service pre-alert for all FAST calls, an increase from 17 hospitals in 2021.
- Nine hospitals (38%) have access to CTP for patients in the ED, an increase from five hospitals in 2021.
- As in 2021, almost all hospitals (n=23; 96%) reported that they provide a thrombolysis service 24 hours a day, 7 days a week.
- Twenty-three hospitals (96%) have an on-site on-call radiographer available to perform brain imaging, an increase from 16 hospitals in 2021, and 9 (38%) hospitals have an on-call on-site radiologist available to perform brain imaging, an increase from 3 in 2021.
- Eleven hospitals (46%) have on-call stroke teams available 24 hours a day, 7 days a week, six (25%) have on-call stroke teams available Monday–Friday, 9.00am–5.00pm, and seven (29%) do not have on-call stroke teams (Table 5.3).
- In 13 hospitals (54%), patients who received thrombolysis were most likely to be admitted to a CCU, HDU or ICU after ED.
- Eighteen hospitals (75%) reported that patients with a stroke are always or usually transferred to the care of the stroke team/stroke consultant after admission.
- All hospitals made use of Protocol 37 when transferring patients for thrombectomy, and 18 hospitals (86%) reported that they experienced delays longer than 30 minutes waiting for a Protocol 37 ambulance on more than 1 occasion.



# 6. ORGANISATION OF STROKE UNITS

# 6. ORGANISATION OF STROKE UNITS

**GUIDELINE:** Patients with acute stroke should be admitted directly to a stroke unit with protocols to maintain normal physiological status and staff trained in their use (Intercollegiate Stroke Working Party, 2023).

## PATIENT FLOW AFTER THE ED

The majority of hospitals (n=18; 75%) report that patients who have not received thrombolysis are most likely to be admitted to a stroke unit bed after ED. For patients who have received thrombolysis, 13 hospitals (54%) report that patients are most likely to be admitted to a higher dependency bed such as a CCU, HDU or ICU, and ten (42%) hospitals admit those patients to a stroke unit.

### Key features of a stroke unit

- dedicated beds for patients with a stroke only
- MDT including doctors, nurses, physiotherapists (PTs), occupational therapists (OTs), speech and language therapists (SLTs), dieticians, psychologists, medical social workers (MSWs)
- 24/7 monitoring and early intervention for complications like aspiration, deep vein thrombosis or worsening stroke
- standardised protocols for thrombolysis, secondary prevention and rehabilitation
- early mobilisation and rehabilitation planning
- patient and family education and support.

## STROKE UNIT BED AVAILABILITY

Admission to a stroke unit and length of stay in a stroke unit are national KQIs with a target of 90%. These KQIs are reported on a quarterly basis on the INAS dashboard and inform the HSE's annual National Service Plan (HSE, 2025). In order to achieve the agreed target, hospitals should have the appropriate number of stroke unit beds. All participating hospitals reported that they have a stroke unit (Table 5.1).

Stroke unit bed types are defined in the *National Clinical Guideline for Stroke for the United Kingdom and Ireland* (Intercollegiate Stroke Working Party, 2023) as follows:

- Type 1: Acute stroke unit bed
- Type 2: Rehabilitation bed
- Type 3: Combined acute and rehabilitation bed.

In Ireland, beds are not normally designated in this way, although the survey did ask for this information. Table 6.1 shows the number of stroke unit beds, including both acute stroke unit beds and combined acute and rehabilitation beds.[21] In total, there were 244 designated stroke unit beds (Type 1: 138; Type 3: 106), a marginal increase from 239 in 2021. Thirty eight percent of beds (n=93) were reported as monitored beds (Type 1: 63; Type 3: 30), an increase from 74 (31%) in 2021. Ten hospitals (42%) reported that there were no monitored beds in the stroke unit. Those 10 hospitals then reported that patients who receive thrombolysis are admitted to a high dependency bed after thrombolysis.

Seventeen hospitals (71%) reported having access to continuous electrocardiogram (ECG) monitoring, down from 18 in 2021; 16 hospitals (67%) had access to respiratory monitoring, unchanged from 2021; 19 hospitals (79%) had access to pulse oximetry, an increase from 17 in 2021. For a detailed breakdown of monitoring availability by hospital, please refer to the INAS Organisational Audit National Reporting Table.

Four hospitals reported having access to on-site rehabilitation beds (Type 2: 38) for stroke patients.

[21] Type 2 beds are excluded as these are not specifically designated stroke unit beds.

**TABLE 6.1:** NUMBER OF STROKE UNIT BEDS, BY HOSPITAL

| | Number of stroke admissions in 2024 recorded in Hospital In-Patient Enquiry (HIPE) | Stroke unit beds | | KQI 1: Percentage of cases admitted to a stroke unit | KQI 2: Percentage of time patients spent in a stroke unit |
|---|---|---|---|---|---|
| | | Number of beds | Number of monitored beds | % | % |
| Bantry General Hospital | 68 | 4 | 4 | 87% | 100% |
| Beaumont Hospital | 601 | 26 | 11 | 89% | 94% |
| Cavan General Hospital | 161 | 8 | 0 | 82% | 84% |
| Connolly Hospital | 299 | 10 | 2 | 74% | 31% |
| Cork University Hospital | 739 | 31 | 31 | 75% | 90% |
| Letterkenny University Hospital | 201 | 8 | 0 | 78% | 77% |
| Mater Misericordiae University Hospital | 389 | 18 | 6 | 72% | 63% |
| Mayo University Hospital | 238 | 12 | 0 | 93% | 89% |
| Mercy University Hospital | 92 | 6 | 0 | 75% | 86% |
| Naas General Hospital | 191 | 10 | 0 | 70% | 93% |
| Our Lady of Lourdes Hospital Drogheda | 313 | 10 | 0 | 87% | 87% |
| Portiuncula University Hospital | 68 | 4 | 0 | 20% | 73% |
| Regional Hospital Mullingar | 181 | 4 | 4 | 20% | 68% |
| Sligo University Hospital | 265 | 10 | 0 | 92% | 90% |
| St James's Hospital | 309 | 6 | 6 | 42% | 67% |
| St Luke's General Hospital, Carlow/Kilkenny | 194 | 6 | 2 | 87% | 57% |
| St Vincent's University Hospital | 439 | 10 | 2 | 60% | 69% |
| Tallaght University Hospital | 409 | 9 | 9 | 89% | 31% |
| Tipperary University Hospital | 163 | 12 | 0 | 85% | 76% |
| University Hospital Galway | 374 | 10 | 1 | 71% | 35% |
| University Hospital Kerry | 261 | 4 | 4 | 54% | 43% |
| University Hospital Limerick | 531 | 15 | 6 | 71% | 79% |
| University Hospital Waterford | 212 | 7 | 5 | 67% | 66% |
| Wexford General Hospital | 184 | 4 | 0 | 50% | 65% |
| **Total** | **6882** | **244** | **93** | **73%** | **69%** |

# ORGANISATION OF STROKE UNIT BEDS

**GUIDELINE:** Patients with suspected acute stroke should be admitted directly to a hyperacute stroke service and be assessed for emergency stroke treatments by a specialist clinician without delay (Intercollegiate Stroke Working Party, 2023).

The total number of designated stroke unit beds was reported as 244, a 2% increase from 239 in 2021. On the day the survey was completed, the total number of patients with a stroke in the hospital was reported as 406, an increase from 342 in 2021. This would indicate that 60% of patients with a stroke had access to a stroke unit bed, a decrease from 70% in 2021. In addition, only 219 patients (54%) were in a stroke unit bed at the time of the survey, however, this is a snapshot in time and in 2024, 73% of patients with a stroke accessed stroke unit care.. Figure 6.1 shows the number of designated stroke unit beds in each hospital compared with the number of patients with a stroke in the hospital on the day of survey completion. On the day of survey completion, 18 out of 24 hospitals had more patients with a stroke in the hospital than designated stroke unit.

**CLINICAL IMPACT: THE PROPORTION OF PATIENTS WHO SPEND 90% OR MORE OF THEIR HOSPITAL STAY IN A STROKE UNIT REMAINED UNCHANGED.**

| 2021 | 69% | 2024 | 69% |
|---|---|---|---|

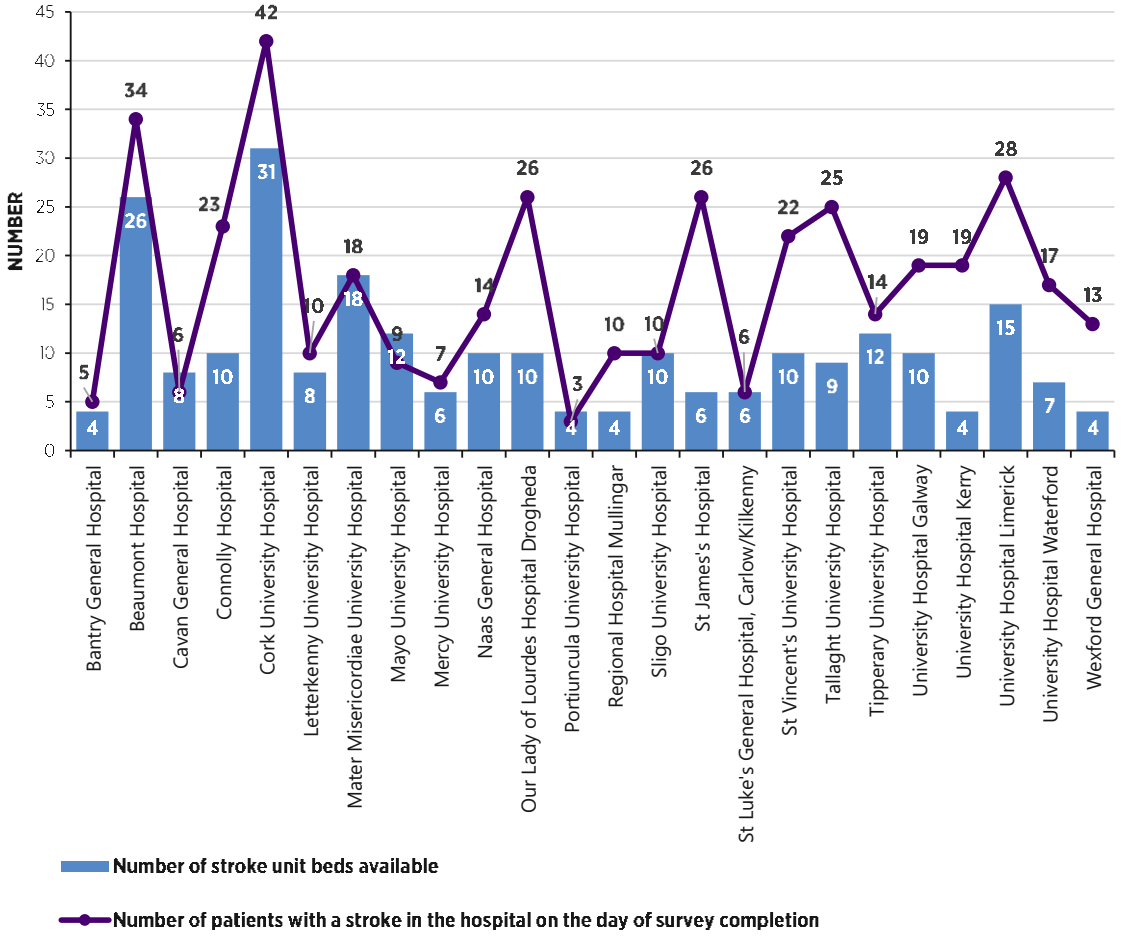



**FIGURE 6.1:** NUMBER OF STROKE UNIT BEDS (N=244) IN COMPARISON TO NUMBER OF PATIENTS WITH A STROKE BY HOSPITAL

# STROKE UNIT BED OCCUPANCY

**GUIDELINE:** Stroke unit beds should be protected for patients with a stroke and it is recommended that a bed should be kept vacant in order to facilitate timely access to the stroke unit (HSE, 2012).

While the hospital may have designated stroke unit beds, on occasion the beds may be occupied by patients with a different condition. In total, on the day of survey completion, stroke unit bed occupancy by patients with a stroke was 90% (n=219), an increase from 82% in 2021. Figure 6.2 shows the number of designated stroke unit beds compared with the number of patients with a stroke occupying a stroke unit bed.

**CLINICAL IMPACT: THE PROPORTION OF PATIENTS WITH A STROKE WHO WERE ADMITTED TO A STROKE UNIT HAS INCREASED.**

| 2021 | 69% | 2024 | 73% |
|---|---|---|---|

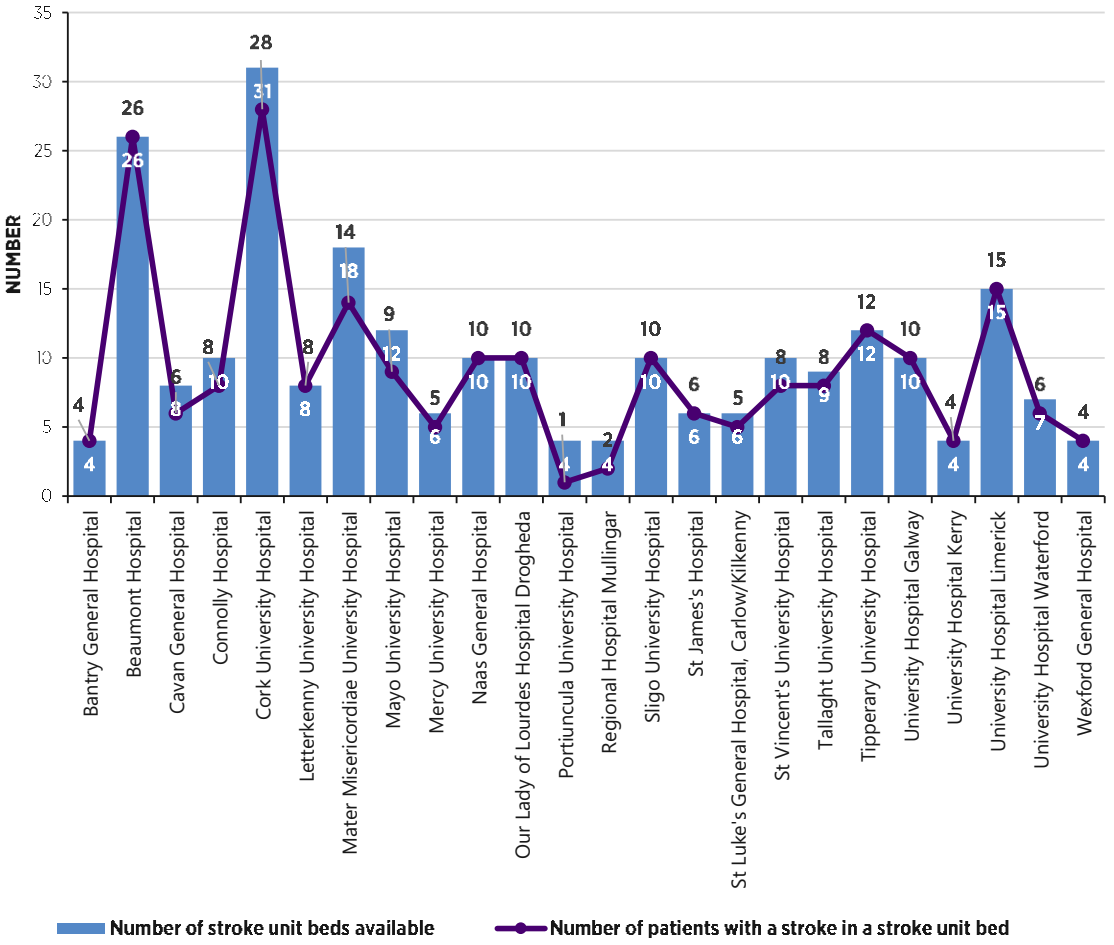



**FIGURE 6.2:** NUMBER OF STROKE UNIT BEDS (N=244) COMPARED WITH THE NUMBER OF STROKE UNIT BEDS OCCUPIED BY PATIENTS WITH A STROKE (n=219), BY HOSPITAL

# HUMAN RESOURCES

## Medical resourcing

**GUIDELINE:** An acute stroke unit should have continuous access to a consultant physician with expertise in stroke medicine, with consultant review 5 days per week (Intercollegiate Stroke Working Party, 2023).

Several medical specialties including geriatric medicine, neurology, general medicine and clinical pharmacology contribute to providing stroke service cover in the hospitals surveyed. Figure 6.3 displays the provision of each medical speciality contributing to the stroke service. Most stroke service cover is provided by geriatric medicine, both during normal working hours (n=20; 83%) and out of hours (n=16; 67%). Eleven hospitals (46%) report that out-of-hours stroke service cover is provided by general medical teams. There is a need for a more detailed review of medical staffing for the provision of stroke services in all hospitals, and as part of the *National Stroke Strategy 2022-2027* (NSS) (HSE, 2022) the NCP for Stroke will undertake a workforce planning exercise which will determine specific gaps.

Most hospitals (n=22; 92%) reported having a consultant physician with specialist knowledge of stroke who is formally recognised as having principal responsibility for stroke services. This position was vacant in two hospitals (8%). However, fewer than one-half of hospitals (n=11; 46%) report having a specialist stroke service working independently of other roles or responsibilities. In addition, 25% (n=6) of hospitals report that patients with a stroke are not transferred to the care of a stroke consultant after admission.

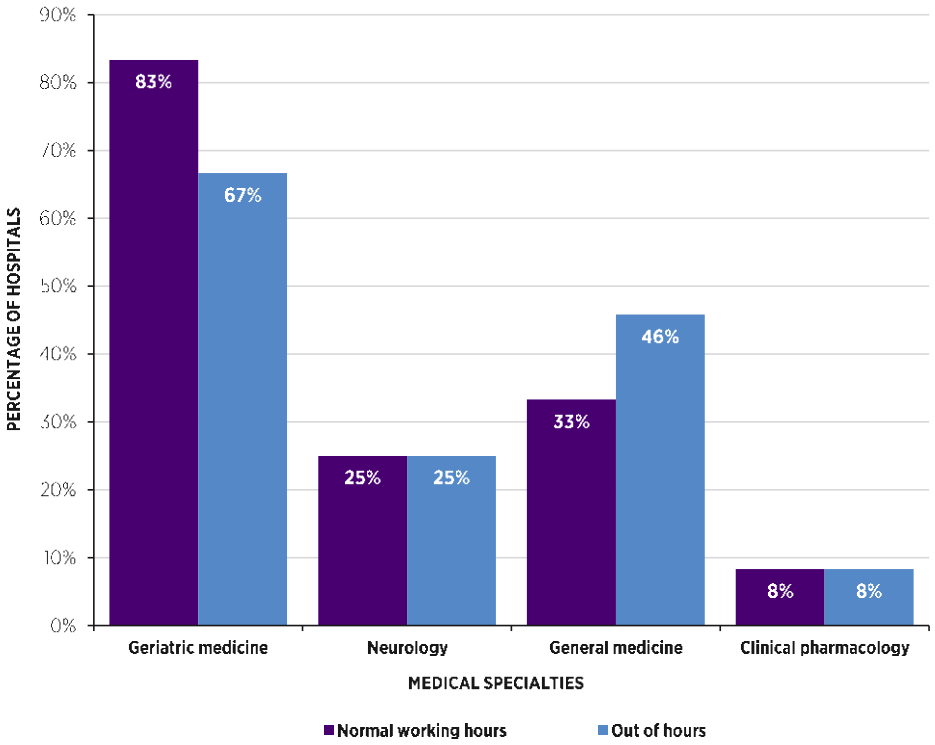



**FIGURE 6.3:** MEDICAL SPECIALTIES CONTRIBUTING TO PROVIDING STROKE SERVICE COVER (N=24)

Beaumont Hospital and Cork University Hospital each have five interventional neuroradiologists in post to manage the 24/7 EVT service.

## Nurse resourcing

**RECOMMENDATION:** Stroke units must be staffed with nurses with special interest, training and expertise in stroke care (Intercollegiate Stroke Working Party, 2023).

Within Ireland, nurse staffing in acute stroke units is guided by the nationally endorsed *Framework for Safe Nurse Staffing and Skill Mix in General and Specialist Medical and Surgical Care Settings in Ireland 2018* (Department of Health, 2018). This framework, implemented across adult acute hospitals, ensures that staffing reflects real-time patient acuity and dependency. It is acknowledged that other countries apply various models to determine nurse staffing in stroke services. The INAS collaborated with the Stroke Nurse Lead in the NCP for Stroke and the National Lead for Safe Nurse Staffing and Skill Mix in the Office of the Nursing and Midwifery Services Director (ONMSD) to identify a way to monitor the delivery of the framework in the context of stroke units (Appendix 5).

As the 2021 report did, this report compares the number of nurses, both registered general nurses (RGNs) and healthcare assistants (HCAs), recommended by the ESO, as per its stroke unit recommendations, with the actual staffing levels in each stroke unit (Ringelstein *et al*., 2013). The ESO recommends that there should be 1 monitored or hyperacute stroke unit bed for every 100 stroke admissions annually, as the average stay for monitoring has been calculated to be 72 hours. Because patients with a stroke have intensive nursing requirements, the ESO recommends that hospitals employ 1.5 whole-time equivalent (WTE) nurses per monitored bed per 24 hours, and 0.5 WTE nurses (both RGNs and HCAs) per non-monitored bed per 24 hours (Ringelstein *et al*., 2013). As we did in 2021 (NOCA, 2022b), we calculated the number of recommended WTE nurses per stroke unit by identifying how many monitored beds are recommended for each hospital's stroke unit based on that hospital's annual stroke admissions. We then multiplied that number by 1.5 (1.5 WTE nurses per monitored bed). The remaining number of beds in each stroke unit was multiplied by the lower recommendation of 0.5 (0.5 WTE nurses per non-monitored bed). Figure 6.4 compares the total number of nurse staffing employed by each hospital, both RGNs and HCAs, with the nurse staffing quotas per 24 hours recommended by the ESO.

In 2025, 19 stroke units (79%) operated with nurse staffing below the level recommended by the ESO, an improvement from 21 stroke units in 2021. A total of 132 nurses (RGNs: 99.5; HCAs: 32.5) was allocated to stroke units per 24-hour period nationally,[22] equivalent to 69% of the number recommended by the ESO, resulting in a 31% deficit.

[22] Monday to Friday

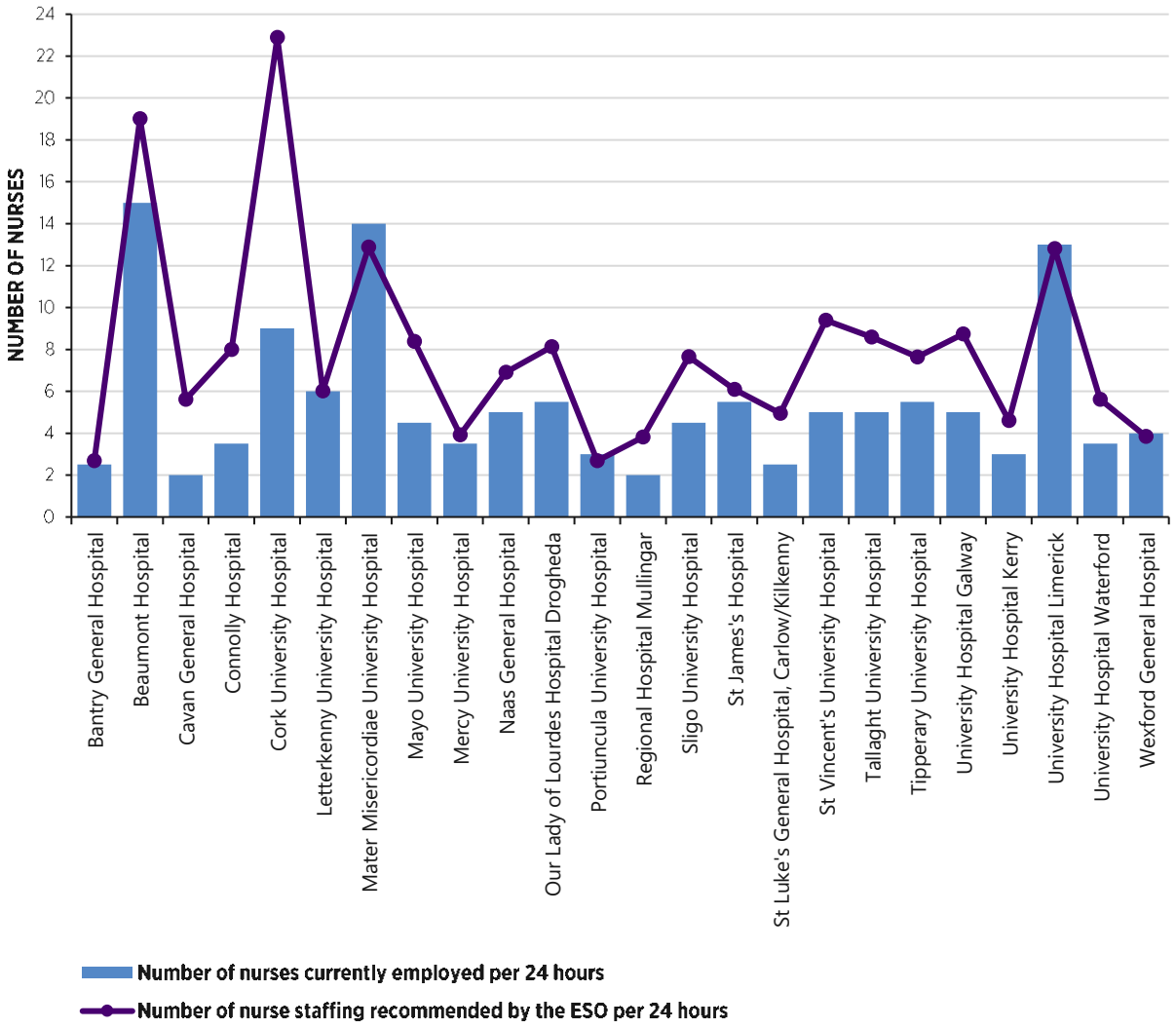



**FIGURE 6.4:** CURRENT NUMBER OF NURSE STAFFING EMPLOYED PER 24 HOURS COMPARED WITH THE NUMBER OF NURSE STAFFING RECOMMENDED BY THE ESO PER 24 HOURS, BY HOSPITAL

## SPECIALIST NURSING SERVICE

In 2025, one-half of the hospitals (n=12) had an advanced nurse practitioner (ANP) specialising in stroke care, an increase from seven hospitals in 2021. Nearly all hospitals (n=23) employed 1 or more clinical nurse specialist (CNS) in stroke, a slight rise from 22 hospitals in 2021 (Table 6.2). ANPs and CNSs are all involved in direct patient care and emergency response, staff and patient education and outpatient clinics. Some provide expertise to patients in the community as well. Further information by hospital is available in the INAS Organisational Audit Reporting Table.

## NURSE EDUCATION AND TRAINING

Eighteen hospitals (75%) report that they have an in-house programme for continuing education in management of stroke, a decrease from 20 hospitals in 2021. Overall, 344 nurses were trained in stroke assessment and management, a slight increase from 342 nurses in 2021. Only 15 hospitals (63%) report a policy that all staff should complete the Stroke Training and Awareness Resources programme, also a decrease from 20 hospitals with this policy in 2021. The majority of hospitals (n=17; 71%) report that there is funding available for staff education or conference attendance.

A swallow screening training programme is available in all hospitals, an increase from 21 hospitals in 2021. Overall, 351 nurses are trained in swallow screening, and the NCP for Stroke has prioritised swallow screening as a quality improvement (QI) project for 2025. Other members of the stroke team who have participated in swallow screening training include SLTs in 15 hospitals, ED nurses in 6 hospitals and doctors in 8 hospitals.

Monitoring the number of patients who receive a swallow screen is a KQI, and the ongoing QI project has resulted in an increased number of patients who receive swallow screening compared with 2021 (NOCA, 2022b).



**CLINICAL IMPACT: THE PROPORTION OF PATIENTS WHO RECEIVE SWALLOW SCREENING HAS INCREASED**

| 2021 | 68% | 2024 | 81% |
|---|---|---|---|

**TABLE 6.2:** NUMBERS OF ADVANCED NURSE PRACTITIONERS IN STROKE AND CLINICAL NURSE SPECIALISTS IN STROKE BY HOSPITAL (N=24)

| Hospital | Number of ANPs in stroke | Number of CNSs in stroke |
|---|---|---|
| Bantry General Hospital | N/A | 1 |
| Beaumont Hospital | N/A | 4 |
| Cavan General Hospital | N/A | N/A |
| Connolly Hospital | 1 | 1 |
| Cork University Hospital | 1 | 4 |
| Letterkenny University Hospital | N/A | 1 |
| Mater Misericordiae University Hospital | 2 | 4 |
| Mayo University Hospital | 1 | 1 |
| Mercy University Hospital | 0 | 1 |
| Naas General Hospital | 1 | 1 |
| Our Lady of Lourdes Hospital Drogheda | 1 | 1 |
| Portiuncula University Hospital | N/A | 1 |
| Regional Hospital Mullingar | 1 | 1 |
| Sligo University Hospital | 1 | 1 |
| St James's Hospital | N/A | 2 |
| St Luke's General Hospital, Carlow/Kilkenny | N/A | 1 |
| St Vincent's University Hospital | 1 | 1 |
| Tallaght University Hospital | 3 | 2 |
| Tipperary University Hospital | N/A | 1 |
| University Hospital Galway | 1 | 1 |
| University Hospital Kerry | N/A | 1 |
| University Hospital Limerick | 1 | 2 |
| University Hospital Waterford | N/A | 1 |
| Wexford General Hospital | N/A | 1 |
| **Total** | **15** | **35** |

# HEALTH AND SOCIAL CARE PROFESSIONAL RESOURCES

**GUIDELINE:** An acute stroke unit should provide stroke specialist rehabilitation staff (Intercollegiate Stroke Working Party, 2023)

Recommendations regarding the appropriate health and social care professional (HSCP) staffing ratios in stroke units are documented in the *National Stroke Strategy 2022-2027* (NSS), (HSE, 2022). Each discipline has a recommended WTE per 5 beds. Due to the shortage of stroke unit beds nationally (Figure 6.2), HSCPs are often responsible for providing care for patients with a stroke both in and out of the stroke unit. As such, we calculated the number of HSCPs recommended by the NSS by identifying the number of patients with a stroke in the hospital on the day of the survey, and interpreting that as a reflection of caseload, rather than identifying the number of stroke unit beds. It is important to note that this is a snapshot in time and does not reflect variation in numbers or acuity of patients with a stroke.

In addition, an HSCP may provide care both for patients with a stroke as well as for other patients as part of general service provision. They may not be specifically allocated to the stroke service and therefore may not have the necessary special interest, training or expertise in stroke care. In order to clarify this situation, all hospitals were asked to specify the number of members of the multidisciplinary team (MDT) designated to the stroke service and to report the number of additional WTE staff who deliver stroke care. This information can be found in the INAS Organisational Audit Reporting Table. Free text was available to comment in relation to HSCP staffing. Portiuncula University Hospital reported that it does not have a designated stroke care MDT, but it does have access to an MDT as needed. Connolly Hospital reported that it has a stroke-specific pharmacist. Cork University Hospital reported that it has access to a therapy dog 1 day per week.

It is important to note that when a hospital has missing data in relation to a particular HSCP, the hospital's stroke service may be able to access some HSCP services, but not necessarily a specialist stroke service.

## Physiotherapy

Almost all hospitals (n=23; 96%) reported that there were physiotherapists (PTs) delivering stroke care, with 78% of PTs (n=23) designated for stroke care and 22% (n=6.5) providing stroke care from another service.[23] Eight hospitals (33%) have a PT at clinical specialist grade. All hospitals report that PTs attend weekly MDT meetings, and two hospitals (8%) provide a weekend service. Figure 6.5 illustrates the comparison of the current staffing level of PTs in hospitals against that recommended by the NSS (HSE, 2022). The total recommended number of PTs is 73.1 WTE, while the number of PTs reported by hospitals is 38 WTEs. This represents 52% of the recommended amount, similar to the 53% reported in 2021, indicating a 48% staffing deficit. However, the results are not directly comparable due to differences in methodology. The 2025 results are based on recommendations from the NSS, whereas the 2021 results were guided by the fifth edition of the *National clinical guideline for stroke* (Royal College of Physicians, 2016).

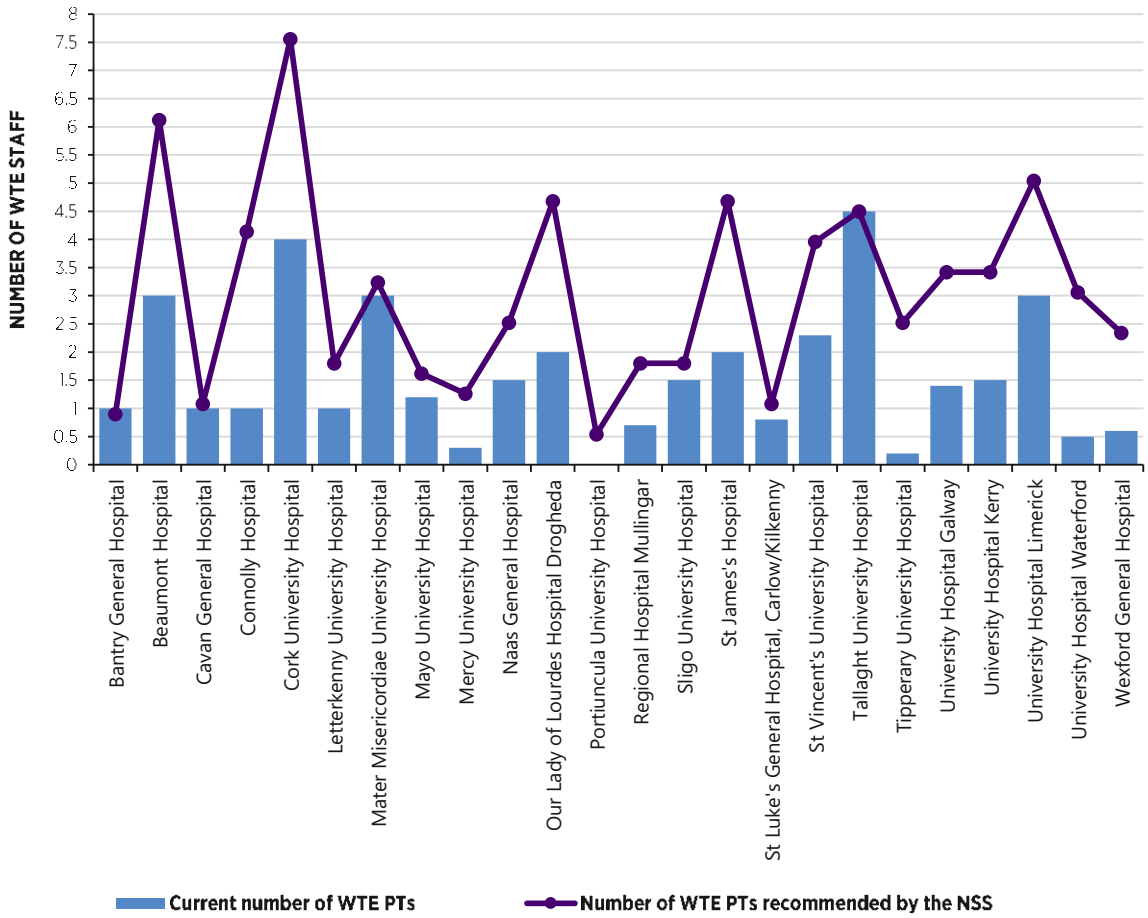



**FIGURE 6.5:** TOTAL CURRENT PHYSIOTHERAPIST STAFFING COMPARED WITH THE PHYSIOTHERAPIST STAFFING RECOMMENDED BY *THE NATIONAL STROKE STRATEGY 2022-2027*, BY HOSPITAL

[23] Information not available for Cork University Hospital and Tallaght University Hospital.

## Occupational therapy

Twenty-two hospitals (92%) reported that there were occupational therapists (OTs) delivering stroke care. Of these OTs, 80% (n=23) were designated for stroke care while 20% (n=5.9) were providing stroke care from another service.[24] Five (21%) hospitals have an OT at clinical specialist grade. All hospitals report that OTs attend weekly MDT meetings, and two hospitals (8%) provide a weekend service. Figure 6.6 illustrates the comparison of the current staffing level of OTs in hospitals against that recommended by the NSS (HSE, 2022). The total recommended number of OTs is 65.0 WTEs, while the number of OTs reported by hospitals is 29.9 WTEs. This represents 46% of the recommended amount, a figure comparable to the 45% reported in 2021,[25] indicating a 54% staffing deficit.

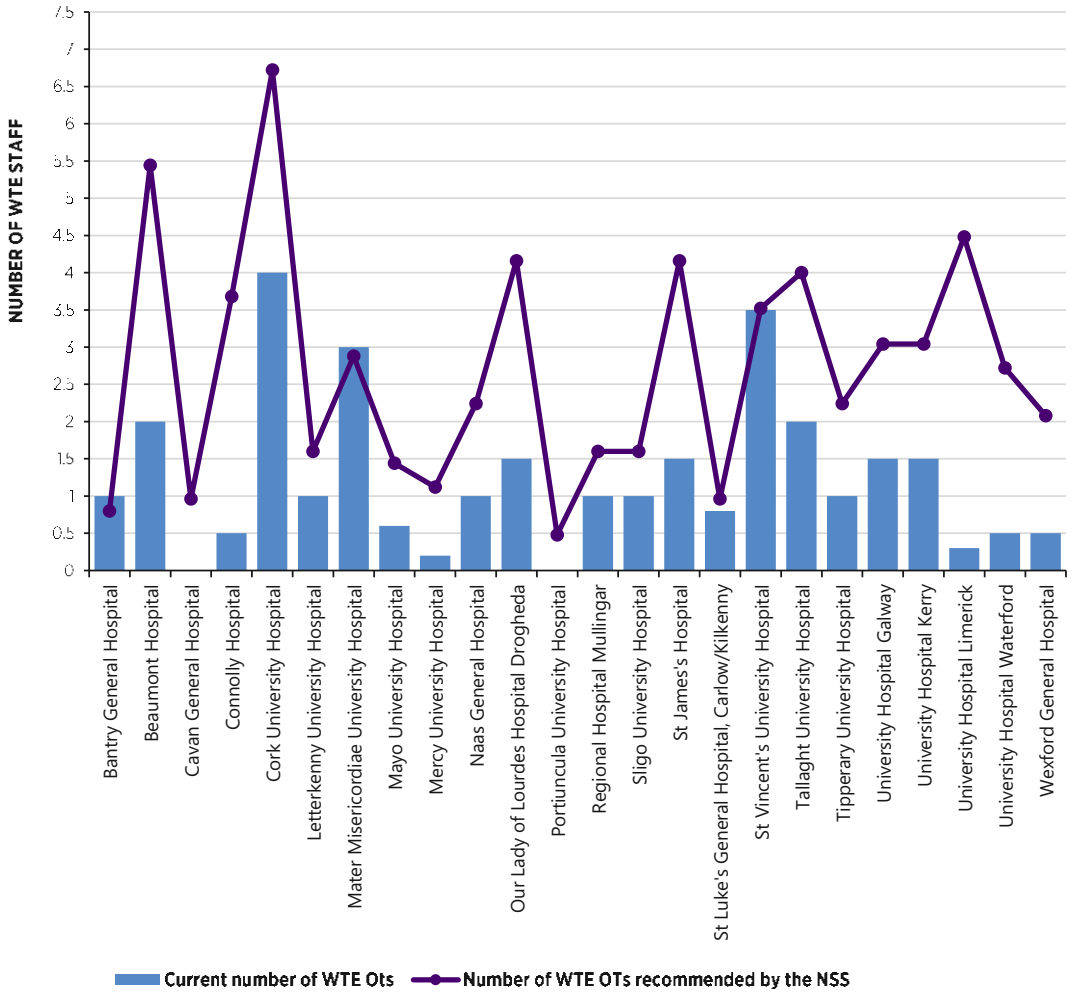



**FIGURE 6.6:** TOTAL CURRENT OCCUPATIONAL THERAPIST STAFFING COMPARED WITH THE OCCUPATIONAL THERAPIST STAFFING RECOMMENDED BY *THE NATIONAL STROKE STRATEGY 2022-2027*, BY HOSPITAL

[24] Information not available for Cork University Hospital.
[25] The 2025 results are based on recommendations from the NSS, whereas the 2021 results were guided by the fifth edition of the *National clinical guideline for stroke* (Royal College of Physicians, 2016).

## Speech and language therapy

Almost all hospitals (n=23; 96%) reported that there were SLTs delivering stroke care, with 70% of SLTs (n=15.4) designated for stroke care and 30% (n=6.6) providing stroke care from another service.[26] Four hospitals (17%) have an SLT at clinical specialist grade. Twenty-two hospitals (92%) report that SLTs attend weekly MDT meetings, and two hospitals (8%) provide a weekend service. Figure 6.7 illustrates the comparison of the current staffing level of SLTs in hospitals against that recommended by the NSS (HSE, 2022). The total recommended number of SLTs is 27.4 WTEs while the number of SLTs reported by hospitals is 25 WTEs. This represents 77% of the recommended staffing level, an improvement from the 66% reported in 2021, indicating a 23% staffing deficit.

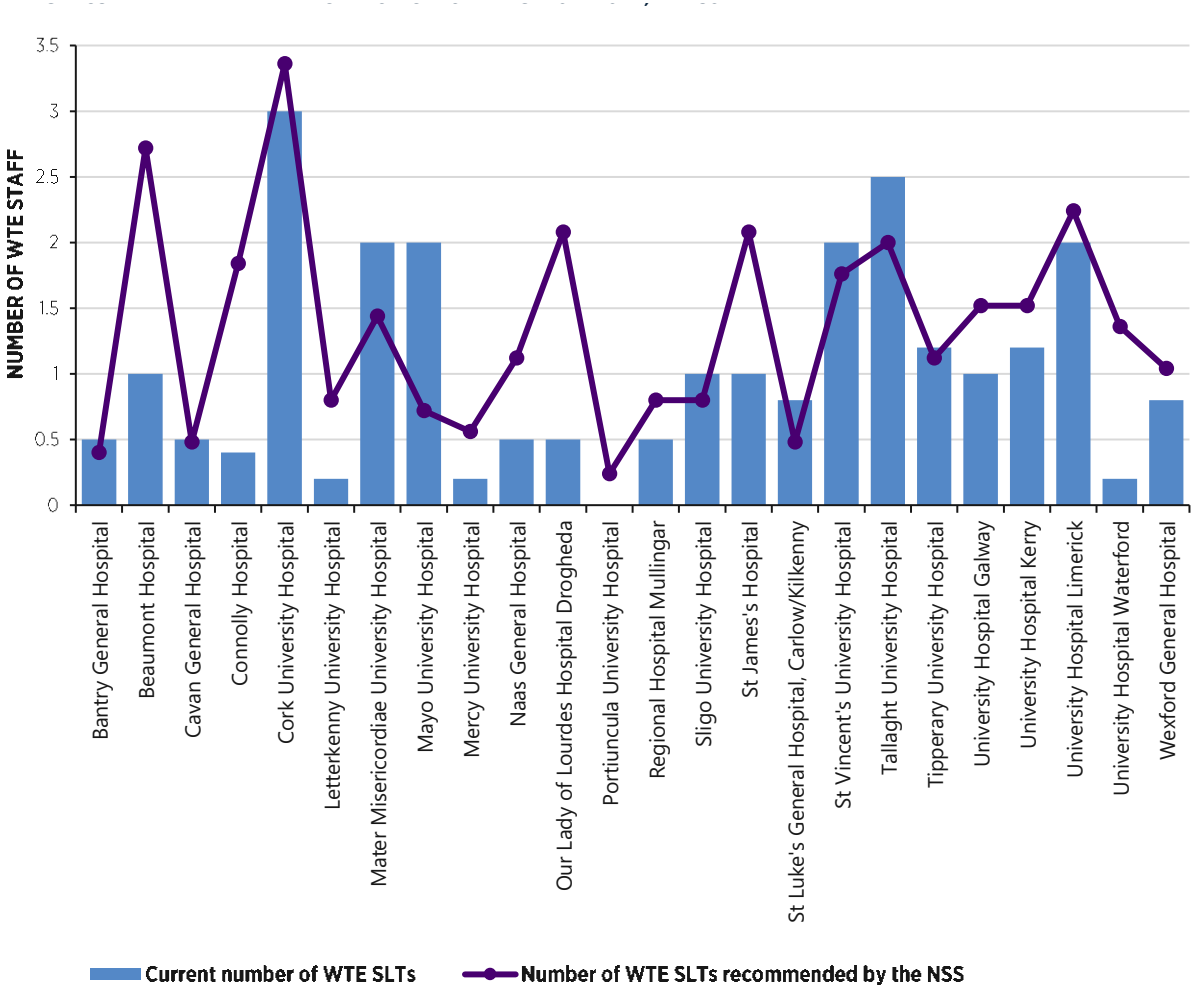



**FIGURE 6.7:** TOTAL CURRENT SPEECH AND LANGUAGE THERAPIST STAFFING COMPARED WITH THE SPEECH AND LANGUAGE THERAPIST STAFFING RECOMMENDED BY T*HE NATIONAL STROKE STRATEGY 2022-2027*, BY HOSPITAL

[26] Information not available for Cork University Hospital.

## Dietetics

Twenty-two hospitals (92%) reported that there were dietitians delivering stroke care, with 72% of dietitians (n=7.6) designated for stroke care and 28% (n=3) providing stroke care from another service[27] One hospital (4%) has a dietitian at clinical specialist grade. Seventeen hospitals (71%) report that dietitians attend weekly MDT meetings, and no hospitals provide a weekend service. Figure 6.8 illustrates the comparison of the current staffing level of dietitians in hospitals against that recommended by the NSS (HSE, 2022). The total recommended number of dietitians is 30.04 WTEs, while the number of dietitians reported by hospitals is 10.6 WTEs. This represents 35% of the recommended staffing level, a decrease from the 57% reported in 2021,[28] indicating a 65% staffing deficit.

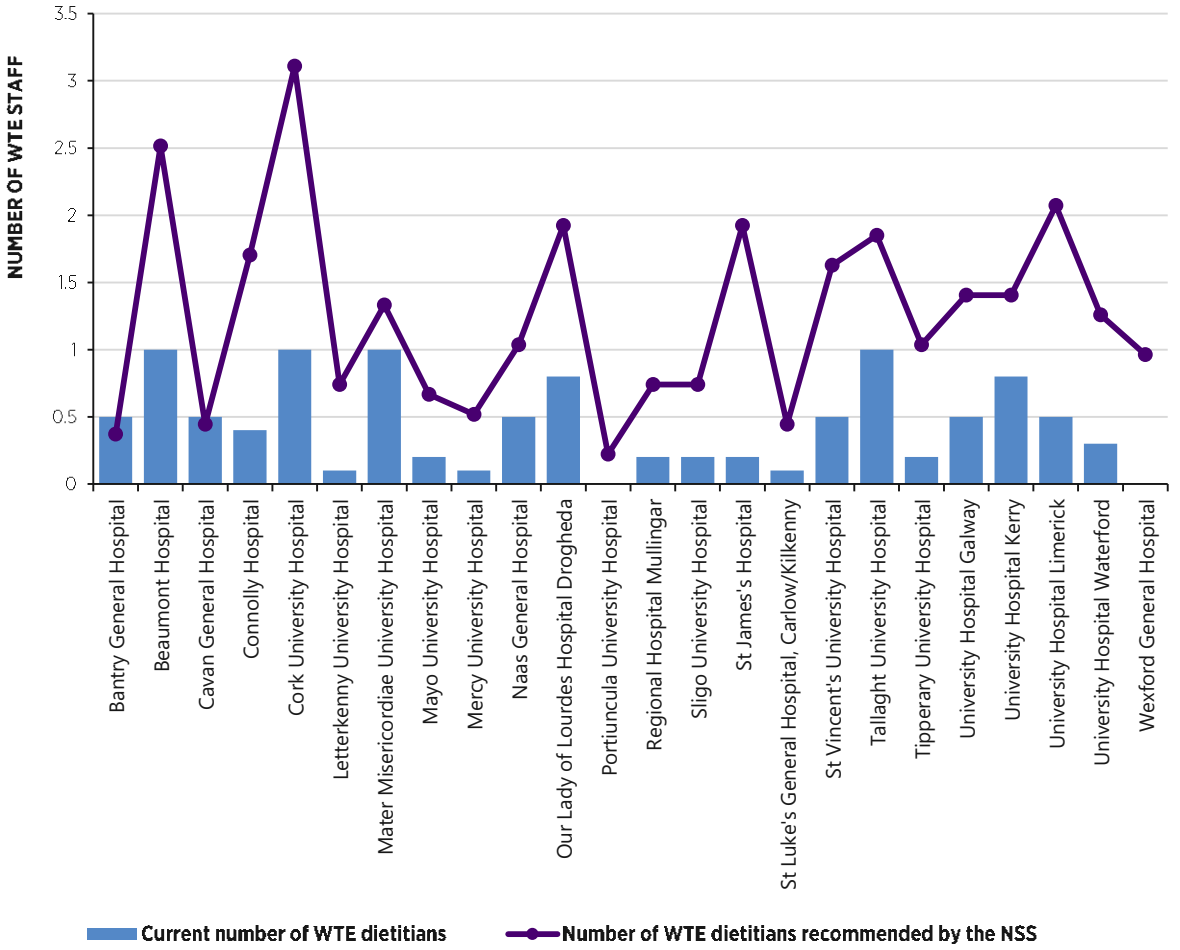



**FIGURE 6.8:** TOTAL CURRENT DIETITIAN STAFFING COMPARED WITH THE DIETITIAN STAFFING RECOMMENDED BY *THE NATIONAL STROKE STRATEGY 2022-2027*, BY HOSPITAL

[27] Information not available for Cork University Hospital.
[28] The 2025 results are based on recommendations from the NSS, whereas the 2021 results were guided by the *National clinical guideline for stroke* (Royal College of Physicians, 2016).

## Psychology

Seven hospitals (29%) reported having psychologists delivering stroke care on their staff, with a combined total of 5.2 WTE psychologists. Eighty-five percent (n=4.4) of these psychologists were designated for stroke care and 15% (n=0.8) providing stroke care from another service. One hospital (4%) has a psychologist at clinical specialist grade. Five hospitals (21%) report that their psychologists attend weekly MDT meetings, and no hospitals provide a weekend service for psychological care. Figure 6.9 illustrates the comparison of the current staffing level of psychologists in hospitals against that recommended by the NSS (HSE, 2022). The total recommended number of psychologists is 20.3 WTEs, while the number of psychologists reported by hospitals is 5.2 WTEs. This represents 26% of the recommended staffing level. While this is an increase from the 20% reported in 2021,[29] it indicates a staffing deficit of 74%.

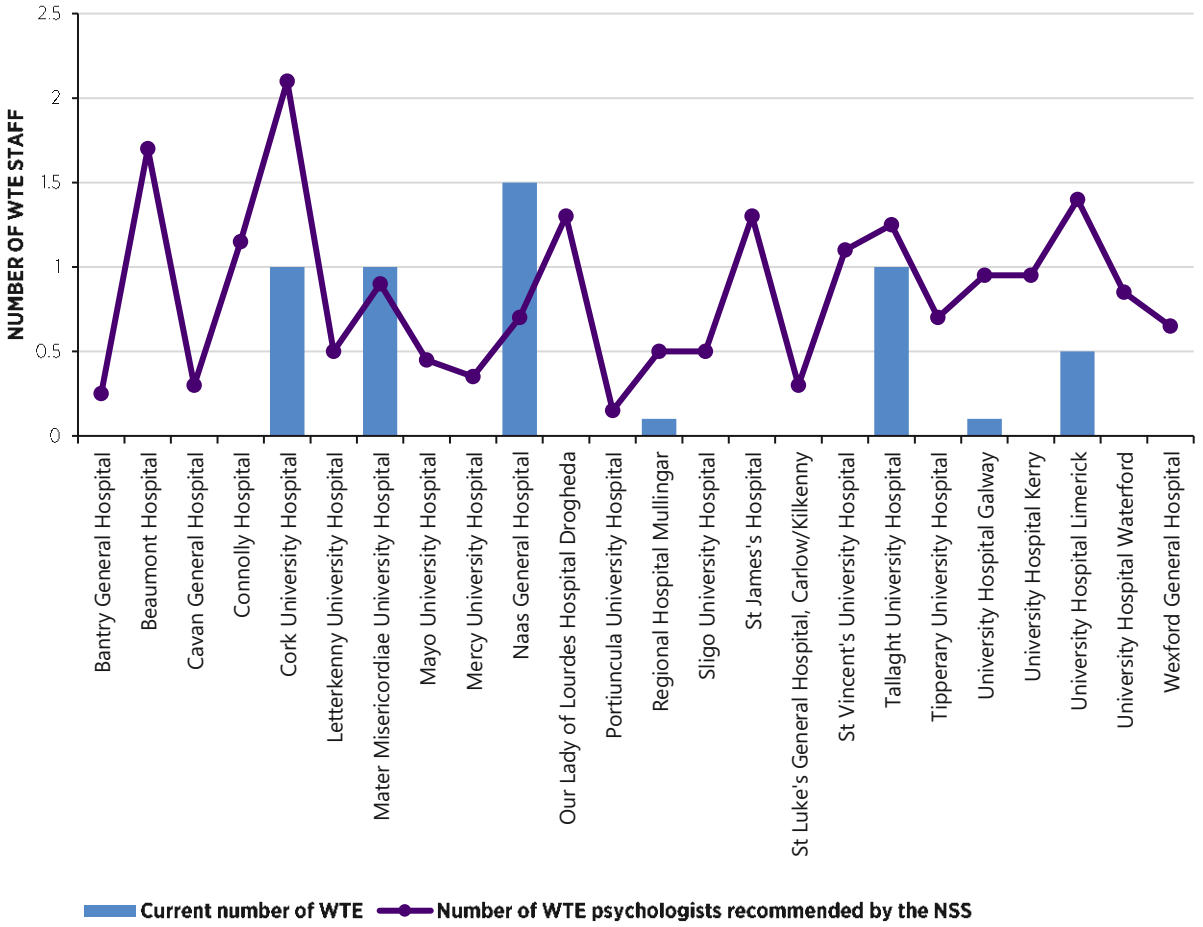



**FIGURE 6.9:** TOTAL CURRENT PSYCHOLOGIST STAFFING COMPARED WITH THE PSYCHOLOGIST STAFFING RECOMMENDED BY THE *NATIONAL STROKE STRATEGY 2022-2027*, BY HOSPITAL

[29] The 2025 results are based on recommendations from the NSS, whereas the 2021 results were guided by the *National clinical guideline for stroke* (Royal College of Physicians, 2016).

## Medical social worker

Nineteen hospitals (79%) reported that there were medical social workers (MSWs) delivering stroke care, with 67% (n=6.6) designated for stroke care and 33% (n=3.2) providing stroke care from another service.

Figure 6.10 illustrates the comparison of the current staffing level of MSWs in hospitals against that recommended by the NSS (HSE, 2022). The total recommended number of MSWs is 40.6 WTEs while the number of MSWs reported by hospitals is 9.8 WTEs. This represents 24% of the recommended staffing level, indicating a 76% staffing deficit. There are no comparative data from 2021 available.

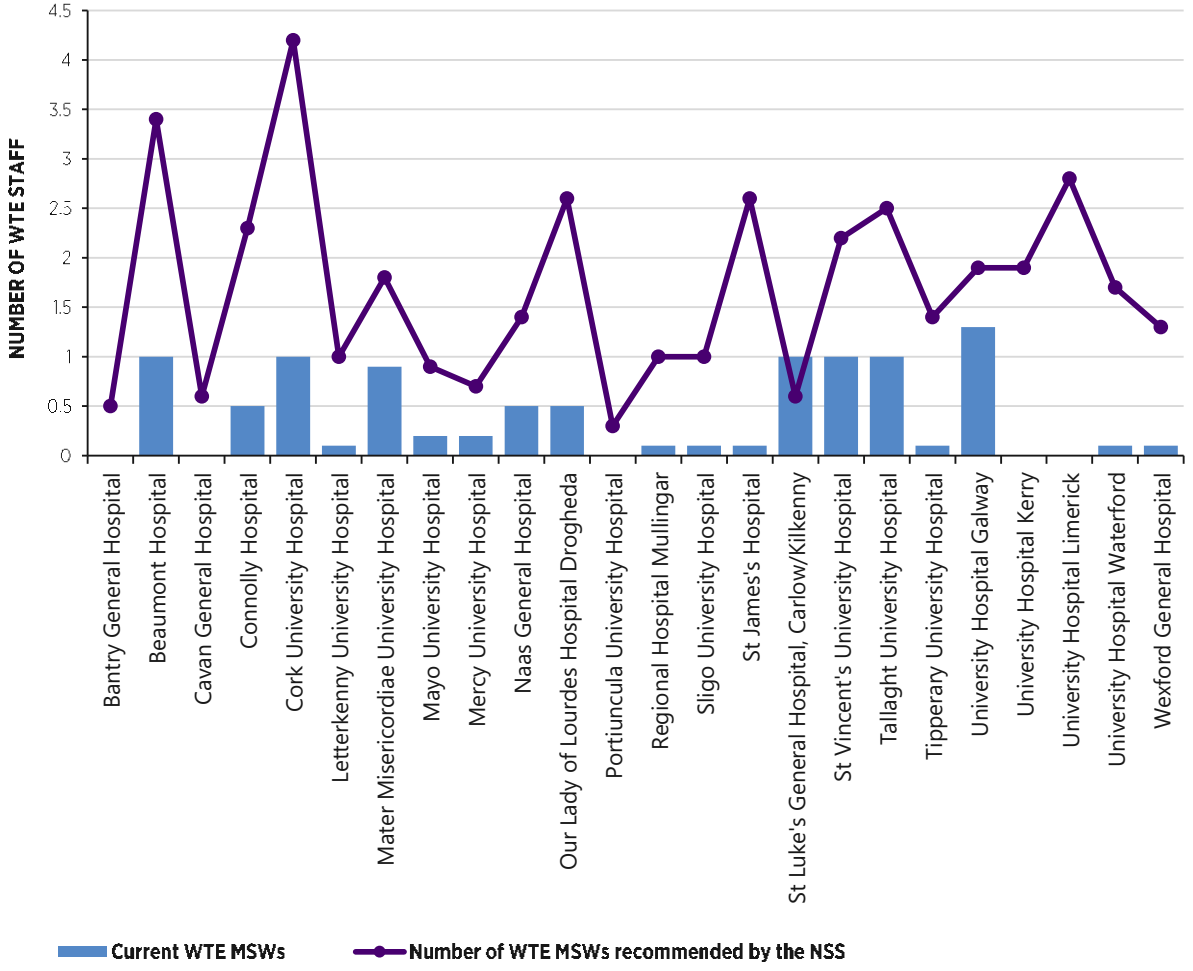



**FIGURE 6.10:** TOTAL CURRENT MEDICAL SOCIAL WORKER STAFFING COMPARED WITH THE MEDICAL SOCIAL WORKER STAFFING RECOMMENDED BY THE *NATIONAL STROKE STRATEGY 2022-2027*, BY HOSPITAL

## Therapy assistants

Eleven hospitals (46%) reported that the stroke service had a physiotherapy assistant, with a combined total of 4.5 WTE positions across the 11 hospitals. Five hospitals (21%) reported having an occupational therapy assistant as part of the stroke service, with a combined total of 2.3 WTE positions across the five hospitals. There were no stroke-specific SLT assistants. Naas General Hospital reported access to a general therapy assistant.

# MDT ACTIVITY

**GUIDELINE:** Consultant-led ward rounds should occur daily in acute stroke units (Intercollegiate Stroke Working Party, 2023).

Ten hospitals (42%) report that consultant-led ward rounds occur daily, either five or seven times per week. Eight hospitals (33%) report rounds occurring two to four times weekly. Two hospitals (8%) report having no regular consultant-led ward rounds, and the remaining 4 hospitals (17%) have rounds up to 60 times per week, reflecting the large number of consultants who provide care to stroke patients.

**GUIDELINE:** A stroke unit should have a coordinated MDT that meets at least once a week for the exchange of information about inpatients with stroke (Intercollegiate Stroke Working Party, 2023).

All hospitals report having MDT meetings for the interchange of information about individual patients on at least a weekly basis. MDT meetings occur on a daily basis in almost one-half (n=9; 47%) of hospitals with Type 1 beds. MDT meetings occur at least once a week in 64% (n=7) of hospitals with Type 3 beds.

## Stroke severity scores

The INAS clinical audit does not collect stroke severity scores on admission, a practice that is currently under consideration. In practice, 23 hospitals (96%) report that they record the severity of a patient's stroke using the National Institutes of Health Stroke Scale (NIHSS) on admission, although only 7 (29%) record it on discharge. Most hospitals (n=21; 88%) record the modified Rankin Scale (mRS) pre-admission, and all record it on discharge. A patient's mRS ranking on discharge is a variable collected within the INAS dataset with a 98% completion rate.

Table 6.3 displays the range of specialist stroke therapies provided, by hospital. The majority (n=19; 79%) are utilising digital therapies for people with aphasia, and specialist therapies such as spasticity management and neuromuscular electrical stimulation are widely available. Access to psychological care remains low, mirroring the scarcity of resources across all hospitals, and only two hospitals have access to an orthoptist.

**TABLE 6.3:** AVAILABILITY OF SPECIALIST STROKE THERAPIES, BY HOSPITAL

| Hopsital (N=24) | Mood screening (n=22) | Psychological care (n=8) | Higher cognitive function assessment (n=23) | Mood treatment (n=20) | Higher cognitive function treatment (n=18) | Specialist spasticity management service (n=12) | Neuromuscular electrical stimulation service (n=17) | Digital therapies for people with aphasia (e.g. apps/ tablet-based interventions) (n=19) | Orthoptist service (n=7) | Stroke-specific pharmacy service (n=7) |
|---|---|---|---|---|---|---|---|---|---|---|
| Bantry General Hospital | ✔ | | ✔ | ✔ | ✔ | | | ✔ | | |
| Beaumont Hospital | ✔ | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | |
| Cavan General Hospital | ✔ | | ✔ | ✔ | ✔ | | ✔ | | | |
| Connolly Hospital | ✔ | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Cork University Hospital | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | | ✔ |
| Letterkenny University Hospital | ✔ | | | ✔ | | | | | | |
| Mater Misericordiae University Hospital | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | |
| Mayo University Hospital | | | ✔ | | | | | | | |
| Mercy University Hospital | ✔ | | ✔ | ✔ | | ✔ | ✔ | ✔ | | |
| Naas General Hospital | ✔ | | ✔ | ✔ | ✔ | | ✔ | ✔ | | ✔ |
| Our Lady of Lourdes Hospital Drogheda | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | | |
| Portiuncula University Hospital | ✔ | ✔ | ✔ | ✔ | | | | | ✔ | ✔ |
| Regional Hospital Mullingar | ✔ | ✔ | ✔ | ✔ | ✔ | | ✔ | ✔ | | |
| Sligo University Hospital | ✔ | | ✔ | ✔ | ✔ | | ✔ | ✔ | ✔ | ✔ |
| St James's Hospital | ✔ | | ✔ | ✔ | | ✔ | ✔ | ✔ | | |
| St Luke's General Hospital, Carlow/Kilkenny | ✔ | | ✔ | | | | | ✔ | | |
| St Vincent's University Hospital | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | | |
| Tallaght University Hospital | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | | ✔ |
| Tipperary University Hospital | | | ✔ | | ✔ | | | | | |
| University Hospital Galway | ✔ | | ✔ | ✔ | ✔ | | ✔ | ✔ | | |
| University Hospital Kerry | ✔ | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | |
| University Hospital Limerick | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | | ✔ | | |
| University Hospital Waterford | ✔ | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | | ✔ |
| Wexford General Hospital | ✔ | | ✔ | | ✔ | | ✔ | ✔ | ✔ | |

## PATIENT EDUCATION AND DISCHARGE INFORMATION

All hospitals reported that they had patient/carer information material easily available on the stroke unit, and 21 hospitals (88%) reported it was available in accessible formats some or most of the time. As was the case in 2021, five hospitals reported that they provide an educational programme for inpatients and carers.

Figure 6.11 displays the resources available to support patients in their transition from hospital to home. Seven hospitals (29%) had a policy to give patients/carers a named hospital contact on discharge, a decrease from 33% in 2021. Seventeen hospitals (71%) had a stroke support group that they could refer patients to, a decrease from 83% in 2021. Almost all hospitals (n=23; 96%) made use of the Irish Heart Foundation's online support services.

Each hospital was asked to name the community rehabilitation or service team to which it refers patients on discharge from hospital. In total, hospitals listed 87 services that were available. Further details can be found in the INAS Organisational Audit Reporting Table. It will be necessary to perform a more detailed survey if INAS commences data collection on community rehabilitation for patients with stroke.

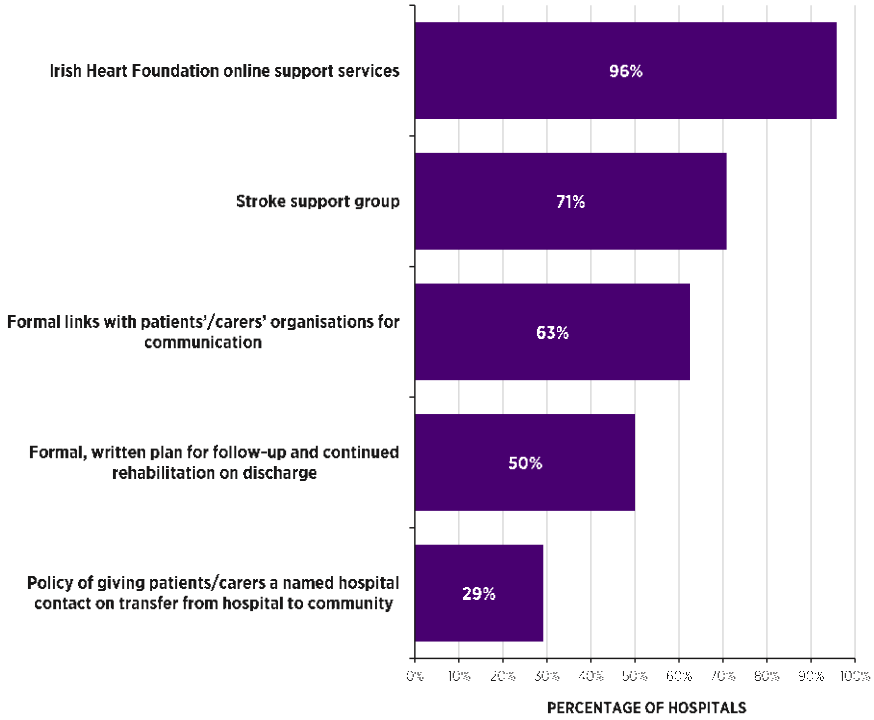



**FIGURE 6.11:** RESOURCES AVAILABLE FOR PATIENTS ON DISCHARGE FROM HOSPITAL

## CHAPTER 6: KEY FINDINGS

- Seventy-five percent of hospitals (n=18) report that patients with a stroke are always or usually transferred to the care of a stroke consultant after admission.
- The total number of designated stroke unit beds was reported as 244, a 2% increase from 239 in 2021.
- Thirty eight percent (n=93) of stroke unit beds were monitored beds, an increase from 74 (31%) in 2021. Ten hospitals (42%) reported that there were no monitored beds in the stroke unit.
- At the time of the survey, 54% of patients with a stroke were in a stroke unit bed, far below the target of 90%.
- The total number of patients with a stroke in the hospital on the day the survey was completed was reported as 406, an increase from 342 in 2021.
- Most stroke service cover is provided by geriatric medicine, both during normal working hours (n=20; 83%) and out of hours (n= 16; 67%).
- Most hospitals (n=22; 92%) reported that there was a consultant physician with specialist knowledge of stroke who is formally recognised as having principal responsibility for stroke services. However, fewer than one-half of hospitals (n=11; 46%) report having a specialist stroke service working independently of other roles or responsibilities.
- There were staffing deficits for all professions making up the MDT, with gaps between recommended staffing and actual staffing as follows: nurses: 31%; PTs: 48%; OTs: 54%; SLTs: 23%; dietitians: 65%; psychologists: 74%; and MSWs: 76%.
- Almost all hospitals (n=23; 96%) made use of the Irish Heart Foundation's online support services.



# 7. AVAILABILITY OF SPECIALIST IMAGING, DIAGNOSTICS AND THERAPIES

# 7. AVAILABILITY OF SPECIALIST IMAGING, DIAGNOSTICS AND THERAPIES

Imaging in acute stroke continues to evolve. Increased availability of interventions, such as thrombectomy, has led to a greater need for complex imaging. Moreover, the need to discuss acute imaging results with colleagues outside the hospitals that carry out the imaging has increased the demand for complex information technology (IT) systems such as the National Integrated Medical Imaging System (NIMIS). Almost all (n=22; 92%) hospitals had in-hospital access to NIMIS, and 16 hospitals (n=67%) reported having remote access, an increase from 54% in 2021 (Table 7.1). All clinicians should be able to access images from all hospitals that provide care for stroke (e.g. between endovascular thrombectomy (EVT) centres and referring hospitals). Broadening time frames for intervention, as recommended in the guidelines on intravenous thrombolysis for acute ischaemic stroke provided by the *National clinical guideline for stroke* (Intercollegiate Stroke Working Party, 2023), has increased the need for technologies such as magnetic resonance imaging (MRI) scanning and computed tomography perfusion (CTP) (Table 5.4).

Table 7.1 shows the availability of specialist imaging for each hospital. Twenty-three (96%) hospitals have access to MRI scanning, an increase from 22 in 2021. Five (22%) hospitals have access to MRI scanning out of hours,[30] an increase from one in 2021. Positron emission tomography (PET) scanning was available in four hospitals (17%), and digital subtraction angiography (DSA) was available in three hospitals (13%). However, it was not reported how often hospitals use these methodologies.

**TABLE 7.1:** AVAILABILITY OF ADVANCED IMAGING, BY HOSPITAL

| | Access to NIMIS | | MRI scanning available in hospital (n=23) | PET scanning available in hospital (n=4) | DSA available in hospital (n=3) |
|---|---|---|---|---|---|
| | In the hospital (n=22) | Remotely (n=17) | | | |
| Bantry General Hospital | | | | | |
| Beaumont Hospital | ✔ | ✔ | ✔ | | ✔ |
| Cavan General Hospital | ✔ | | ✔ | | |
| Connolly Hospital | ✔ | ✔ | ✔ | | |
| Cork University Hospital | ✔ | ✔ | ✔ | ✔ | ✔ |
| Letterkenny University Hospital | ✔ | ✔ | ✔ | | |
| Mater Misericordiae University Hospital | ✔ | ✔ | ✔ | ✔ | |
| Mayo University Hospital | ✔ | | ✔ | | |
| Mercy University Hospital | | | ✔ | | |
| Naas General Hospital | ✔ | ✔ | ✔ | | |
| Our Lady of Lourdes Hospital Drogheda | ✔ | ✔ | ✔ | | |
| Portiuncula University Hospital | ✔ | ✔ | ✔ | | |
| Regional Hospital Mullingar | ✔ | ✔ | ✔ | | |
| Sligo University Hospital | ✔ | ✔ | ✔ | | |
| St James's Hospital | ✔ | ✔ | ✔ | ✔ | |
| St Luke's General Hospital, Carlow/Kilkenny | ✔ | | ✔ | | |
| St Vincent's University Hospital | ✔ | | ✔ | ✔ | |
| Tallaght University Hospital | ✔ | ✔ | ✔ | | |
| Tipperary University Hospital | ✔ | ✔ | ✔ | | |
| University Hospital Galway | ✔ | ✔ | ✔ | | |
| University Hospital Kerry | ✔ | | ✔ | | |
| University Hospital Limerick[31] | ✔ | ✔ | ✔ | | |
| University Hospital Waterford | ✔ | ✔ | ✔ | | |
| Wexford General Hospital[32] | ✔ | | ✔ | | ✔ |

[30] Out-of-hours access includes having access always as well as sometimes.
[31] PET scanning is available within working hours only for EVT patients and if it will be read by the EVT centre at University Hospital Limerick.
[32] DSA can be viewed by radiologists as required.

## IMAGING OF INTRACRANIAL VESSELS

Imaging of intracranial vessels for patients with ischaemic stroke is performed in all hospitals. It is a routine investigation for all patients with a stroke in 11 hospitals (46%), an increase from 7 in 2021. In 13 hospitals (54%) it is only performed for patients who would be amenable to specific treatment if an abnormality is detected. Most hospitals (n=23; 96%) use computed tomography angiography (CTA) as the method of imaging intracranial vessels, both during normal working hours and during out-of-hours periods. Five hospitals (21%) use magnetic resonance angiography (MRA) as a method of performing imaging of cranial vessels during normal working hours, and no hospitals use this method during out-of-hours periods. Results by hospital can be found in the INAS Organisational Audit Reporting Table.

The waiting times for patients to receive carotid imaging did not change from what they were in 2021. The majority of hospitals (n=18; 75%) reported that patients usually receive carotid imaging on the same day or the next weekday, and one-quarter of hospitals (n=6; 25%) reported that patients receive carotid imaging within 1 week (Figure 7.1).

Additional commentary to this question indicated that CTA is a standard of care on admission for patients with acute stroke, suggesting that the waiting time pertains only to those who did not receive it on admission. One hospital reported that, if a patient does not receive CTA on admission, outpatient waiting time can be months.

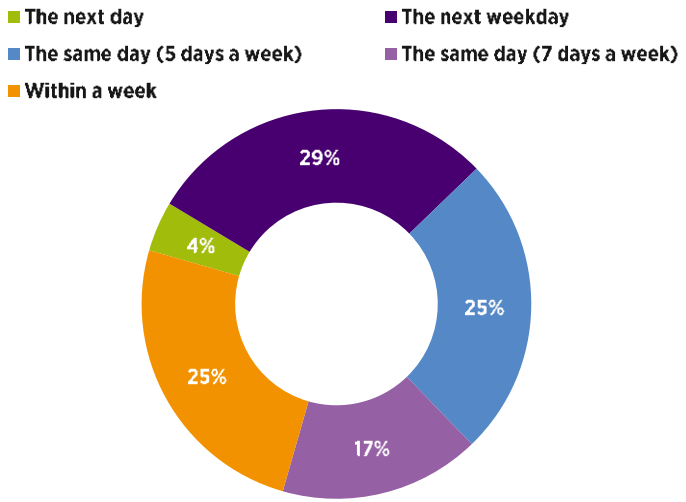



**FIGURE 7.1:** USUAL WAITING TIME FOR PATIENTS TO RECEIVE CAROTID IMAGING

## IMAGING OF EXTRA-CRANIAL VESSELS

Imaging of extra-cranial vessels was unchanged from 2021. All hospitals reported that they perform extra-cranial vessel imaging for patients with ischaemic stroke, and in 16 hospitals (67%) it was reported as a routine investigation for all patients with a stroke. The remaining eight hospitals (33%) perform extra-cranial vessel imaging only for patients who would be amenable to specific treatment if an abnormality was detected. Figure 7.2 shows the imaging modalities used both in-hours and out of hours. As was the case in 2021, most hospitals (n=15; 63%) use CTA during normal working hours, and the majority (n=22; 92%) use this method during out-of-hours periods. Three hospitals (13%) use MRA during normal working hours, and one hospital (4%) uses MRA during out of hours. One hospital reported providing no service out of hours.

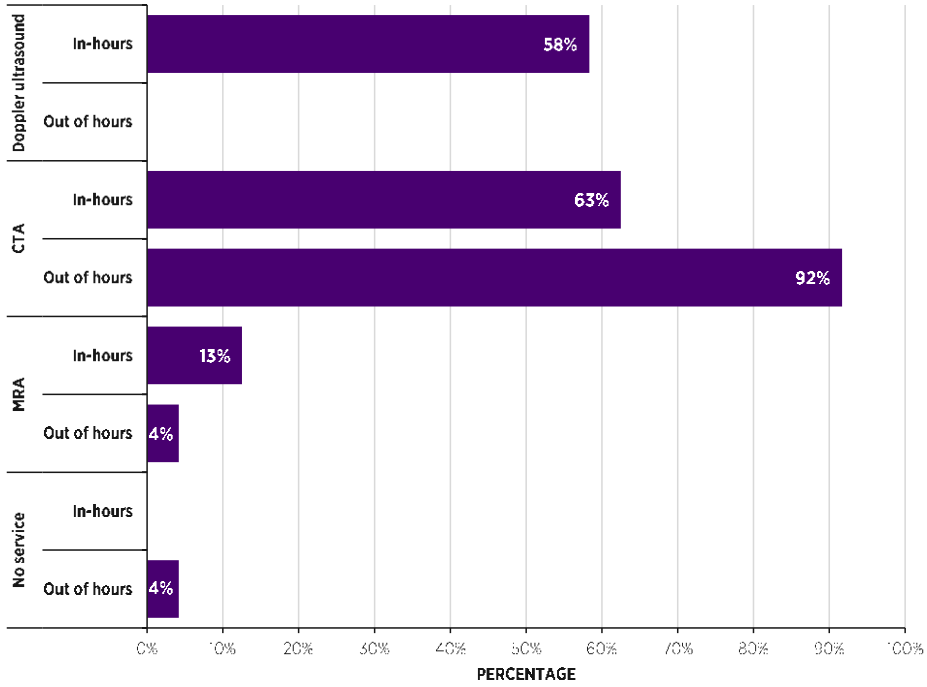



**FIGURE 7.2:** METHODS USED BOTH IN-HOURS AND OUT OF HOURS FOR IMAGING EXTRA-CRANIAL VESSELS

# CARDIAC INVESTIGATIONS

## DIAGNOSING ATRIAL FIBRILLATION AFTER STROKE

**GUIDELINE:** Patients with ischaemic stroke or transient ischaemic attack (TIA), in whom no other cause of stroke has been found after comprehensive neurovascular investigation (stroke of undetermined aetiology, or 'cryptogenic' stroke) and in whom a cardioembolic cause is suspected, should be considered for more prolonged sequential or continuous cardiac rhythm monitoring with an external patch, wearable recorder or implantable loop recorder if they are appropriate for anticoagulation (Intercollegiate Stroke Working Party, 2023).

Each hospital was asked to identify the investigative pathway used to detect paroxysmal atrial fibrillation (AF) in its stroke service.

All hospitals have access to a range of cardiac rhythm monitoring to detect paroxysmal AF. Sixteen hospitals (67%) reported that bedside telemetry monitoring in an acute stroke unit is the first step in detecting paroxysmal AF. Three hospitals (13%) reported the use of an R test monitor, 4 (17%) reported the use of an inpatient 24-hour recording device and 1 hospital used a 48-hour extended cardiac recording device as the first step in detecting AF.

Use of extended cardiac recording over 48 hours was the second line of investigation in 6 (25%) hospitals, and another 6 (25%) reported the use of an R test monitor as the second line of investigation. Use of a reveal/implantable loop recorder was reported as the most common third through eighth line of investigation (Table 7.2). The reveal/implantable loop recorder appears to be a more accessible method of monitoring than it was in 2021, when it was used most often as the final line of investigation.

**TABLE 7.2:** USUAL PATHWAY FOR DETECTING PAROXYSMAL ATRIAL FIBRILLATION

| | First | Second | Third | Fourth | Fifth | Sixth | Seventh | Eight | Test not availale |
|---|---|---|---|---|---|---|---|---|---|
| Stroke unit telemetry monitoring | 16 | | | | | | | | 3 |
| Inpatient 24-hour tape | 4 | 4 | 1 | 1 | | | | | 2 |
| Outpatient 24-hour tape | | 4 | 5 | 3 | | 1 | 1 | | 1 |
| Extended cardiac recording: 48 hours | 1 | 6 | 4 | 2 | 2 | | | | 2 |
| Extended cardiac recording: 5–7 days | | 2 | 3 | 1 | 2 | 1 | | | 4 |
| Reveal/implantable loop recorder | | 2 | 6 | 5 | 5 | 2 | | | 1 |
| (Transdermal patch (e.g. Ziopatch | | | | 1 | | | 1 | 1 | 9 |
| R test monitor | 3 | 6 | 2 | | | | | 1 | 7 |

## DIAGNOSING OTHER CARDIOEMBOLIC SOURCES

Twenty-one hospitals (88%) reported that they perform a transthoracic echocardiogram (TTE) on the majority of patients post-stroke, an increase from 79% in 2021. Eleven hospitals (46%) reported that they perform a TTE in young patients with suspicion of patent foramen ovale (PFO), an increase from 33% in 2021 (Figure 7.3).

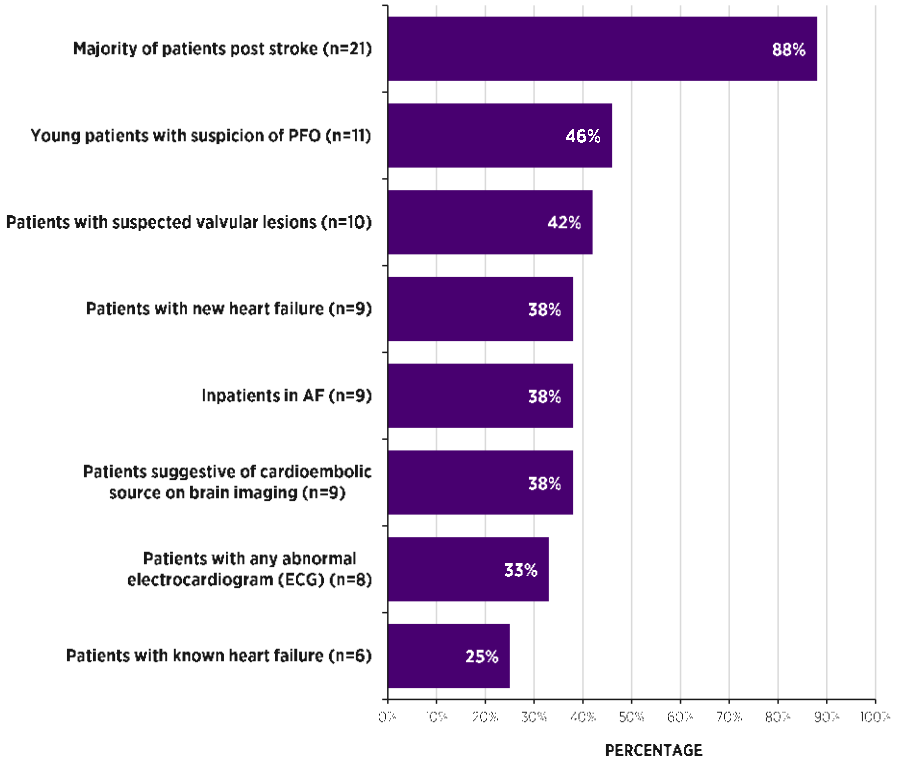



**FIGURE 7.3:** STROKE PATIENT SELECTION FOR ECHOCARDIOGRAPHY

## TRANSOESOPHAGEAL ECHO AND PFO

Twelve hospitals (50%) reported that they request a bubble contrast echo for young patients with suspected PFO. Four hospitals (17%) will request a bubble contrast echo for patients for whom a PFO closure would be considered, and four hospitals (17%) will do so for patients with a normal echo but suspicion of PFO. Ten hospitals (42%) reported that PFO closure is available locally. Fourteen hospitals report that all patients with a stroke are discussed at a specialist stroke/cardiology MDT meeting before PFO closure is offered.

Ten hospitals (42%) reported that they perform a transoesophageal echocardiogram (TOE) if a patient has had a positive bubble contrast echo. Some hospitals (n=13; 54%) selected 'other' on the survey questionnaire, commenting that they also perform a TOE for patients with a suspected cardioembolic source not answered by transthoracic echo or other cryptogenic strokes.

## THROMBOPHILIA SCREENING

All hospitals have access to thrombophilia screening, and the majority (n=23; 96%) request it only for patients under a specific age. One hospital reported that it only requests this test in patients who have a previous history of previous deep vein thrombosis, pulmonary embolism or miscarriage.

## TIA AND NEUROVASCULAR CLINICS

**GUIDELINE:** Patients with acute neurological symptoms that resolve completely within 24 hours of onset (i.e. suspected TIA) should be assessed urgently within 24 hours by a stroke specialist clinician in a neurovascular clinic or an acute stroke unit (Intercollegiate Stroke Working Party, 2023).

As was the case in 2021, the majority of hospitals (n=23; 96%) routinely admit patients with TIA, and five hospitals (21%) have agreed protocols between hospital and primary care services. Six hospitals (25%) operate a TIA/neurovascular clinic, an increase from four in 2021.

In four out of six neurovascular clinics (67%), MRI is the first-line brain imaging modality for suspected TIAs; computed tomography (CT) is used in the remaining two. Carotid doppler (n=3; 50%) and CTA (n=3, 50%) are the two modalities used to image carotid arteries, and all six neurovascular clinics use these modalities frequently (i.e. more than 70% of the time).

## CAROTID STENOSIS TREATMENT: ENDARTERECTOMY

As was the case in 2021, 10 hospitals (42%) provide a carotid endarterectomy service. Eleven out of the remaining 14 hospitals (79%) have a formal arrangement in place with a hospital that provides a carotid endarterectomy service for transfer of patients, an increase from 8 in 2021 (Table 7.3).

## CAROTID STENOSIS TREATMENT: CAROTID STENTING

Twenty-two hospitals (92%) reported that patients had undergone carotid stenting in the previous 12 months. Beaumont Hospital and Cork University Hospital are the two hospitals that provide this service,[33] unchanged from 2021.

**TABLE 7.3:** CARTOID ENDARTERECTOMY SERVICE, BY HOSPITAL

| | Carotid endarterectomy surgery performed within the hospital | Hospital patients referred to | Formal arrangement in place with an endovascular centre/vascular service for transfer of patients |
|---|---|---|---|
| Bantry General Hospital | No | Cork University Hospital/Mercy University Hospital | Yes |
| Beaumont Hospital | Yes | N/A | N/A |
| Cavan General Hospital | No | Beaumont Hospital | Yes |
| Connolly Hospital | No | Beaumont Hospital | Yes |
| Cork University Hospital | Yes | N/A | N/A |
| Letterkenny University Hospital | No | University Hospital Galway | Yes |
| Mater Misericordiae University Hospital | Yes | N/A | N/A |
| Mayo University Hospital | No | University Hospital Galway | No |
| Mercy University Hospital | Yes | N/A | |
| Naas General Hospital | No | Tallaght University Hospital | Yes |
| Our Lady of Lourdes Hospital Drogheda | No | Beaumont Hospital | Yes |
| Portiuncula University Hospital | No | University Hospital Galway | No |
| Regional Hospital Mullingar | No | Mater Misericordiae University Hospital | Yes |
| Sligo University Hospital | No | Mater Misericordiae University Hospital | No |
| St James's Hospital | Yes | N/A | N/A |
| St Luke's General Hospital, Carlow/Kilkenny | No | St James's Hospital | Yes |
| St Vincent's University Hospital | Yes | N/A | N/A |
| Tallaght University Hospital | Yes | N/A | N/A |
| Tipperary University Hospital | No | University Hospital Waterford | Yes |
| University Hospital Galway | Yes | N/A | N/A |
| University Hospital Kerry | No | Cork University Hospital/Mercy University Hospital | Yes |
| University Hospital Limerick | Yes | N/A | N/A |
| University Hospital Waterford | Yes | N/A | N/A |
| Wexford General Hospital | No | St Vincent's University Hospital | Yes |

[33] Three hospitals reported which hospital they referred patients to for endovascular service review, after which the endovascular service would then refer the patient on for carotid stenting.

## CHAPTER 7: KEY FINDINGS

- Six hospitals (25%) operate a TIA/neurovascular clinic, an increase from 4 in 2021; however, the majority (n=23; 96%) of hospitals routinely admit patients with TIA.
- Five hospitals (22%) report limited out-of-hours access to MRI.
- CTA is considered a standard of care for acute stroke and is performed as a routine investigation for all patients with a stroke in 16 hospitals (67%). The remaining eight hospitals (33%) perform only for patients amenable to specific treatment (i.e. thrombectomy).
- All hospitals have access to a range of cardiac rhythm monitoring methods to detect paroxysmal AF.



# 8. ORGANISATION OF EARLY SUPPORTED DISCHARGE SERVICES

# 8. ORGANISATION OF EARLY SUPPORTED DISCHARGE SERVICES

**GUIDELINE:** Hospital inpatients with stroke who have mild to moderate disability should be offered early supported discharge, with treatment at home beginning within 24 hours of discharge (Intercollegiate Stroke Working Party, 2023).

## WHAT IS EARLY SUPPORTED DISCHARGE FOR STROKE?

Early Supported Discharge (ESD) is international best practice in providing care for patients with a stroke, as it improves patient outcomes while facilitating a reduced length of stay in hospital through the provision of stroke-specific rehabilitation in the home setting. Implementation of ESD is a fundamental aspect of the *Stroke Clinical Care Programme: Model of Care* (HSE, 2012).

## ACCESS TO ESD

Fourteen hospitals (58%) have access to an ESD team, an increase from 10 in 2021. ESD services in Cork University Hospital and Mercy University Hospital are provided by one ESD team, which we will refer to as 'Cork ESD Team' for the purposes of this report, therefore there are 13 ESD teams in operation. The stroke service in Cavan General Hospital has access to a generic ESD team which provides ESD to both Cavan General Hospital and Monaghan General Hospital for all patients aged over 65 years who require general reablement/rehabilitation for a range of conditions including stroke. This team is resourced differently from stroke-specific ESD teams due to the broader range of services it provides. However, stroke-specific resources will be required in the future to address current deficits in other disciplines necessary to support patients recovering from a stroke. Similarly, the ESD service in University Hospital Kerry is not stroke specific or funded for stroke, but it nevertheless facilitates stroke patients.

Three teams are newly established since 2022.

Ten out of 13 ESD teams (77%) report that a member of the ESD team attends stroke MDT meetings, an increase from 8 in 2021. All ESD teams provide a next-working-day service to patients being discharged home with ESD, and 9 teams can provide a minimum of 5 days service per week if required. Almost all ESD teams (n=11; 85%) have geographical parameters for patient access to ESD services (Table 8.1).

The majority of ESD teams (n=12; 92%) report that the standard provision of ESD is 4–8 weeks. One ESD service (8%) can provide ESD for up to 3 months, and one (8%) can provide the service for as long as required.

All ESD teams can provide face-to-face therapy over 75% of the time; four (31%) provide ESD face to face 100% of the time.

**TABLE 8.1:** ORGANISATION OF EARLY SUPPORTED DISCHARGE, BY HOSPITAL

| | Access to an ESD team for stroke (n=13) | When ESD service commenced | A member of the ESD team attends the stroke MDT meetings in the hospital (n=10) | Provision of a next-working-day service to patients being discharged on ESD (n=13) | Provision of ESD service for a minimum of 5 days per week if required by patients (n=9) | ESD services have a defined geographical parameter (n=11) |
|---|---|---|---|---|---|---|
| Bantry General Hospital | | | | | | |
| Beaumont Hospital | ✔ | 2017 | ✔ | ✔ | | ✔ |
| Cavan General Hospital | ✔ | June 2021 | ✔ | ✔ | | ✔ |
| Connolly Hospital | ✔ | November 2023 | ✔ | ✔ | ✔ | ✔ |
| Cork ESD Team (Cork University Hospital and Mercy (University Hospital | ✔ | 2016 | ✔ | ✔ | ✔ | ✔ |
| Letterkenny University Hospital | | | | | | |
| Mater Misericordiae University Hospital | ✔ | October 2011 | ✔ | ✔ | | ✔ |
| Mayo University Hospital | | | | | | |
| Naas General Hospital | | | | | | |
| Our Lady of Lourdes Hospital Drogheda | ✔ | March 2023 | ✔ | ✔ | ✔ | ✔ |
| Portiuncula University Hospital | | | | | | |
| Regional Hospital Mullingar | | | | | | |
| Sligo University Hospital | ✔ | November 2020 | ✔ | ✔ | ✔ | |
| St James's Hospital | ✔ | March 2022 | ✔ | ✔ | ✔ | ✔ |
| St Luke's General Hospital, Carlow/Kilkenny | | | | | | |
| St Vincent's University Hospital | ✔ | September 2020 as a pilot | ✔ | ✔ | ✔ | ✔ |
| Tallaght University Hospital | ✔ | November 2012 | ✔ | ✔ | ✔ | |
| Tipperary University Hospital | | | | | | |
| University Hospital Galway | ✔ | August 2013 | | ✔ | ✔ | ✔ |
| University Hospital Kerry | ✔ | 2021 | | ✔ | | ✔ |
| University Hospital Limerick | ✔ | September 2017 | ✔ | ✔ | ✔ | ✔ |
| University Hospital Waterford | | | | | | |
| Wexford General Hospital | | | | | | |

# RESOURCING OF ESD

The *National Stroke Strategy 2022-2027* (NSS) (HSE, 2022) outlines the agreed composition of an ESD team in Ireland based on international best practice (Table 8.2). It also acknowledges that other professions such as pharmacy, dietetics and psychology play a significant role in supporting earlier discharges of patients.

**TABLE 8.2:** COMPOSITION OF AN EARLY SUPPORTED DISCHARGE TEAM

| WTE | Discipline |
|---|---|
| 1 | Occupational therapist (OT), senior |
| 1 | Physiotherapist (PT), senior |
| 1 | Speech and language therapist (SLT), senior |
| 0.5 | Medical social worker (MSW), senior |
| 0.5 | Clinical nurse specialist (CNS) (general) |
| 1 | Therapy assistant |

Each ESD team was asked to report the number of whole-time equivalent (WTE) staff resourced to provide ESD by discipline along with the actual number of WTE staff currently in position.

## Physiotherapy

In 2025, 13.6 WTE PTs were resourced to provide ESD services across the 14 hospitals, and 12.1 were in position. Figure 8.1 shows the number of PTs in position, as well as the numbers resourced but not in position, against the number recommended by the NSS. The majority of ESD teams (n=10; 77%) had the recommended number of PTs. Sligo University Hospital was resourced for one WTE PT but reported having zero WTE PTs in post. St James's Hospital reported that 0.5 of a WTE PT post has been filled.

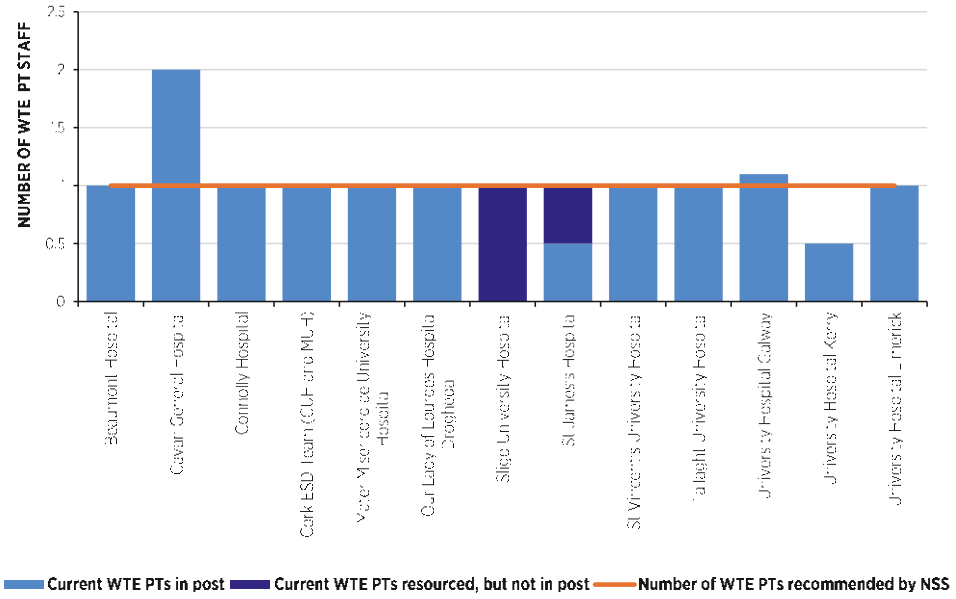



**FIGURE 8.1:** TOTAL CURRENT PHYSIOTHERAPIST STAFFING ON EARLY SUPPORTED DISCHARGE TEAMS COMPARED WITH RECOMMENDED PHYSIOTHERAPIST STAFFING ON EARLY SUPPORTED DISCHARGE TEAMS, AS PER THE *NATIONAL STROKE STRATEGY 2022-2027*, BY HOSPITAL

## Occupational therapy

All ESD teams had the recommended number of OTs in post. Fifteen and one-half WTE OTs were resourced to provide ESD across the 13 teams, and 15.4 were in post.

The recommended number of OTs for ESD teams was 13 WTE OTs, and at the time of survey completion 15.4 WTE OTs were in post. Some of the more established ESD teams e.g. University Hospital Galway are resourced for a larger ESD team, which may explain the difference between the number of WTE OTs recommended by the NSS and the current number of WTE OTs. The size of the ESD team was not asked in the survey.

Figure 8.2 shows the number of OTs in position and the of OTs resourced but not in position against the number recommended by the NSS. The Mater Misericordiae University Hospital had 1.5 WTE OTs resourced, of which 1.4 were filled.

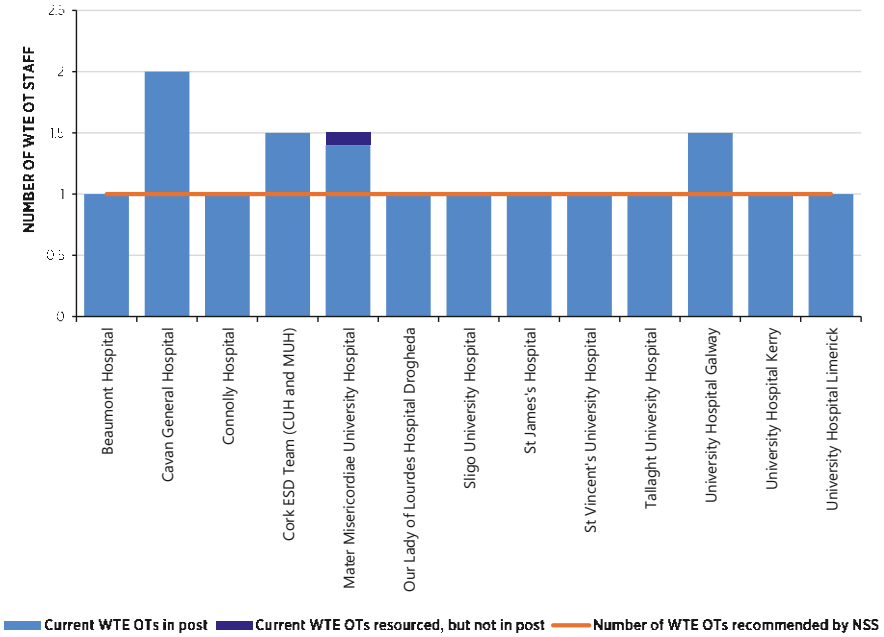



**FIGURE 8.2:** TOTAL OCCUPATIONAL THERAPIST STAFFING ON EARLY SUPPORTED DISCHARGE TEAM COMPARED WITH RECOMMENDED OCCUPATIONAL THERAPIST STAFFING ON EARLY SUPPORTED DISCHARGE TEAM, AS PER THE *NATIONAL STROKE STRATEGY 2022-2027*, BY HOSPITAL

## Speech and language therapy

All ESD teams, apart from Cavan General Hospital and University Hospital Kerry, are fully resourced for one WTE SLT to provide services (Table 8.2). However, four ESD teams report having no available SLT (Figure 8.3).

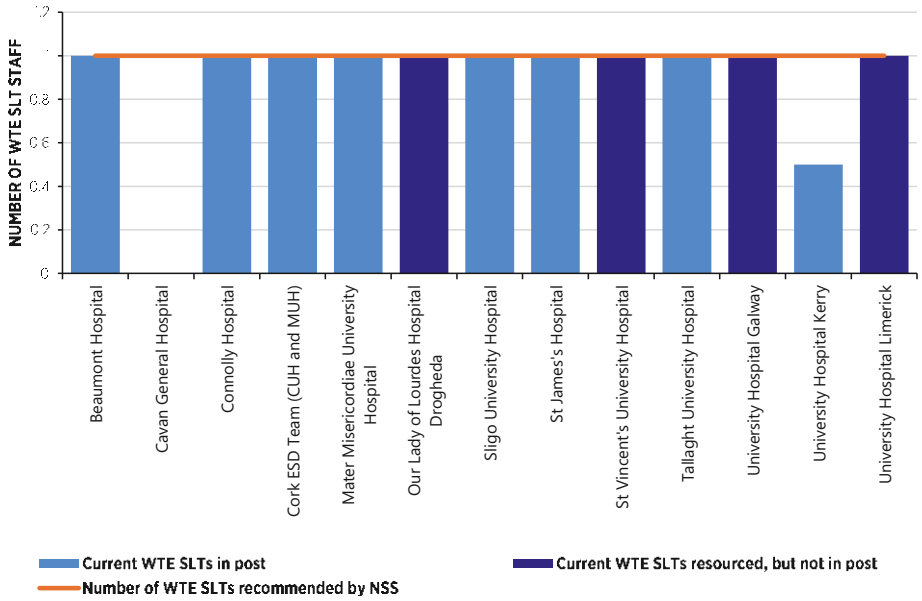



**FIGURE 8.3:** TOTAL SPEECH AND LANGUAGE THERAPIST STAFFING ON EARLY SUPPORTED DISCHARGE TEAM COMPARED WITH RECOMMENDED SPEECH AND LANGUAGE THERAPIST STAFFING ON EARLY SUPPORTED DISCHARGE TEAM, AS PER THE *NATIONAL STROKE STRATEGY 2022-2027*, BY HOSPITAL

## Clinical nurse specialist

A CNS was resourced in six ESD teams.[34] Five WTE CNSs were resourced, and 5 were in post. Figure 8.4 shows the number of CNSs in position and those resourced but not in position compared with the number of CNSs recommended by the NSS. More than one-half of ESD teams (n=7) were not resourced for a CNS.

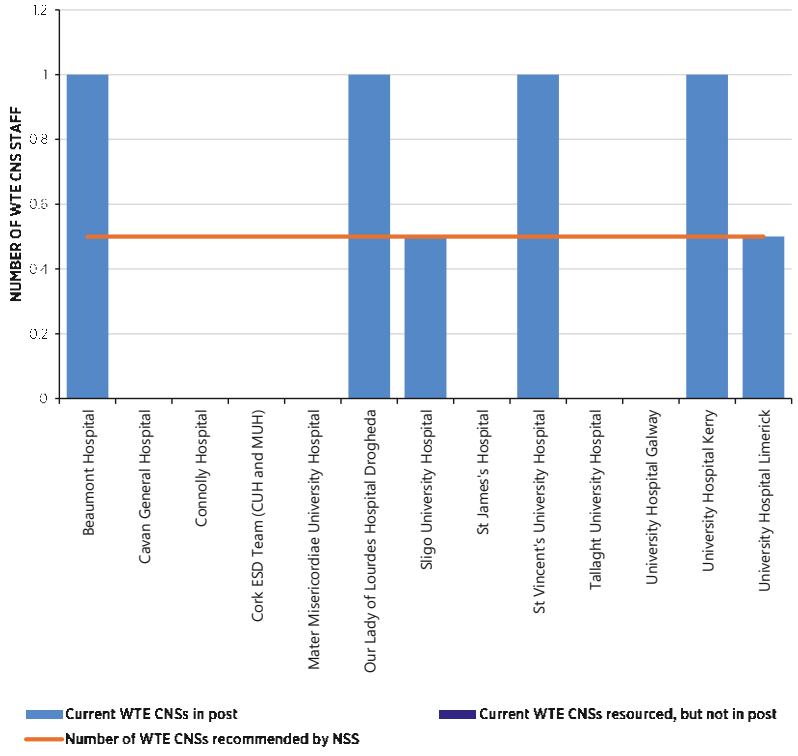



**FIGURE 8.4:** TOTAL CLINICAL NURSE SPECIALIST STAFFING ON EARLY SUPPORTED DISCHARGE TEAM COMPARED WITH RECOMMENDED CLINICAL NURSE SPECIALIST STAFFING ON EARLY SUPPORTED DISCHARGE TEAM, AS PER THE *NATIONAL STROKE STRATEGY 2022-2027*, BY HOSPITAL

## Medical social work

Five hospitals (38%) reported being resourced to provide medical social work services within their ESD teams; however, only four currently have an MSW in post. In addition, University Hospital Galway provides 0.2 WTE staffing positions from existing resources for medical social work within the ESD team (Figure 8.5).

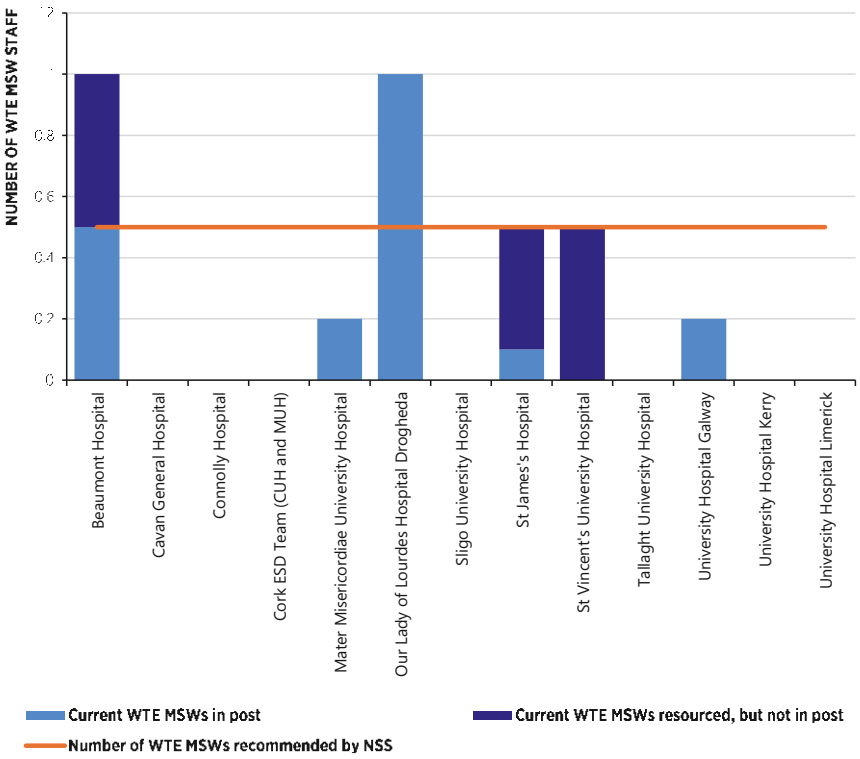



**FIGURE 8.5:** TOTAL MEDICAL SOCIAL WORKER STAFFING ON EARLY SUPPORTED DISCHARGE TEAM COMPARED WITH RECOMMENDED MEDICAL SOCIAL WORKER STAFFING ON EARLY SUPPORTED DISCHARGE TEAM, AS PER THE *NATIONAL STROKE STRATEGY 2022-2027*, BY HOSPITAL

[34] Mater Misericordiae University Hospital notes that StrokeLINK, a service provided by Sláintecare, is used in lieu of an ESD nurse.

## Therapy assistant

Nine teams (69%) reported being resourced for a therapy assistant within their ESD team. In total, there are 8.2 WTE therapy assistants resourced and 8.2 WTE therapy assistants in post. Figure 8.6 shows the number of therapy assistants in position and those resourced but not in position compared with the number of CNSs recommended by the NSS.

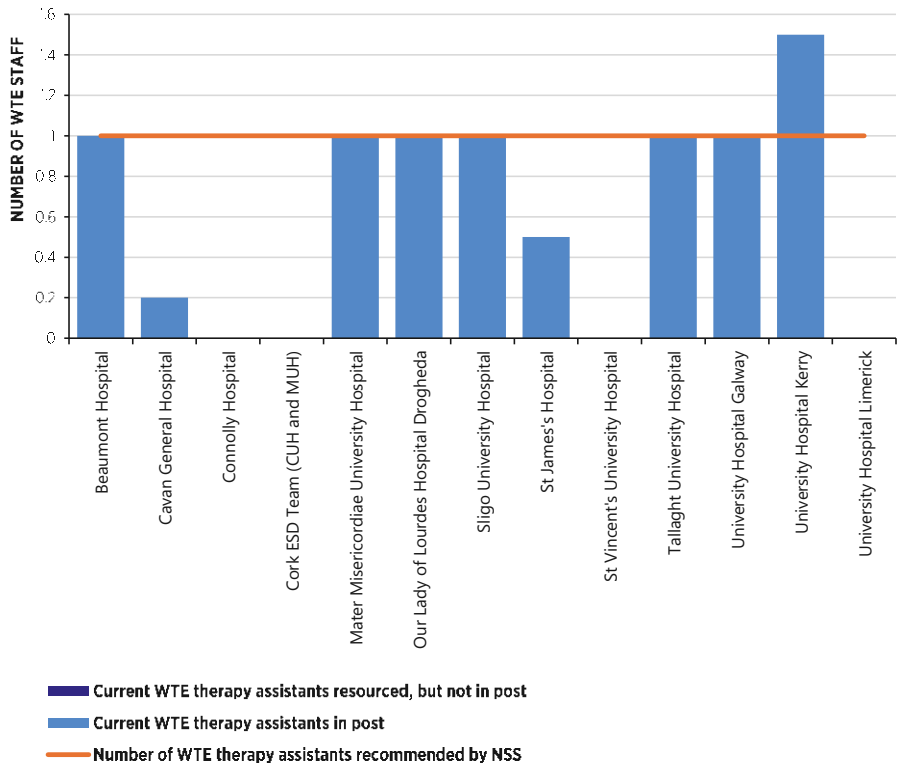



**FIGURE 8.6:** TOTAL THERAPY ASSISTANT STAFFING ON EARLY SUPPORTED DISCHARGE TEAM COMPARED WITH RECOMMENDED THERAPY ASSISTANT STAFFING ON EARLY SUPPORTED DISCHARGE TEAM, AS PER THE *NATIONAL STROKE STRATEGY 2022-2027*, BY HOSPITAL

## CHAPTER 8: KEY FINDINGS

- Fourteen hospitals (58%) have access to an ESD team, an increase from 10 hospitals in 2021.
- All ESD teams provide a next-working-day service to patients with a stroke being discharged home with ESD, and 9 teams can provide care a minimum of 5 days per week if required.
- The majority of hospitals (n=12; 92%) report that the standard length of provision of ESD is 4–8 weeks.
- All ESD teams are resourced to provide physiotherapy, occupational therapy, and speech and language therapy. However, more than one-half of ESD teams are not resourced for a CNS or an MSW, and four ESD teams are not resourced for a therapy assistant.



# 9. QUALITY IMPROVEMENT

# 9. QUALITY IMPROVEMENT

The INAS is more than just a clinical audit. It is a powerful and valuable resource that can be used to support quality improvement (QI) work, assurance work and research that enhances the care of patients with a stroke. The organisational audit findings presented in Chapters 5–8 highlight several critical areas that need improvements in both structural and procedural aspects. Addressing these structural and procedural shortcomings is vital to enhancing the overall patient experience and achieving better health outcomes in stroke care. The INAS Organisational Audit Reporting Table 2025 provides a hospital-by-hospital summary of these findings, enabling the identification of specific structural and procedural deficiencies that need to be addressed in order to deliver high-quality stroke services.

Moreover, this report includes a high-level analysis of the full INAS dataset, offering valuable national context of stroke care. For more detailed insights, individual hospital results are available in the INAS National Reporting Table 2024. We strongly encourage stroke teams to review their own performance, identify opportunities for QI and utilise both local data and the broader INAS findings to track progress over time.

This chapter presents the annual trends in the seven key quality indicators (KQIs) that are monitored via the National Office of Clinical Audit (NOCA) INAS dashboard. Meanwhile, healthcare professionals with a special interest in stroke are continuing to develop QI initiatives with regard to the quality of care given to patients with a stroke. In this chapter, two hospitals showcase their QI projects.

## INAS DASHBOARD

The INAS dashboard (Figure 9.1) continues to support each participating hospital in monitoring the seven KQIs and facilitating their being performed in a timely fashion. Access to the interactive dashboard is available in all hospitals participating in the INAS, and users have access to the results for each KQI from 2016 onwards. Figures 9.2–9.7 display the national results for each KQI, by quarter, from 2017 to 2024. Each figure also presents the national coverage and national mean for each KQI. Each hospital with access to the INAS dashboard should monitor its own trends. If a trend shows deterioration of a KQI for three or more quarters, a QI plan should be considered. Figure 9.7 indicates a sustained and improving increase in the proportion of patients who receive a swallow screen, indicating a response to the Swallow Screening in Acute Stroke: National Quality Improvement Project led by the NCP for Stroke and supported by National Quality and Patient Safety. This project is presented in more detail in the *Irish National Audit of Stroke National Report 2023* (NOCA, 2025). Data on the timeliness of swallow screening will be incorporated into the next phase of the national QI project.

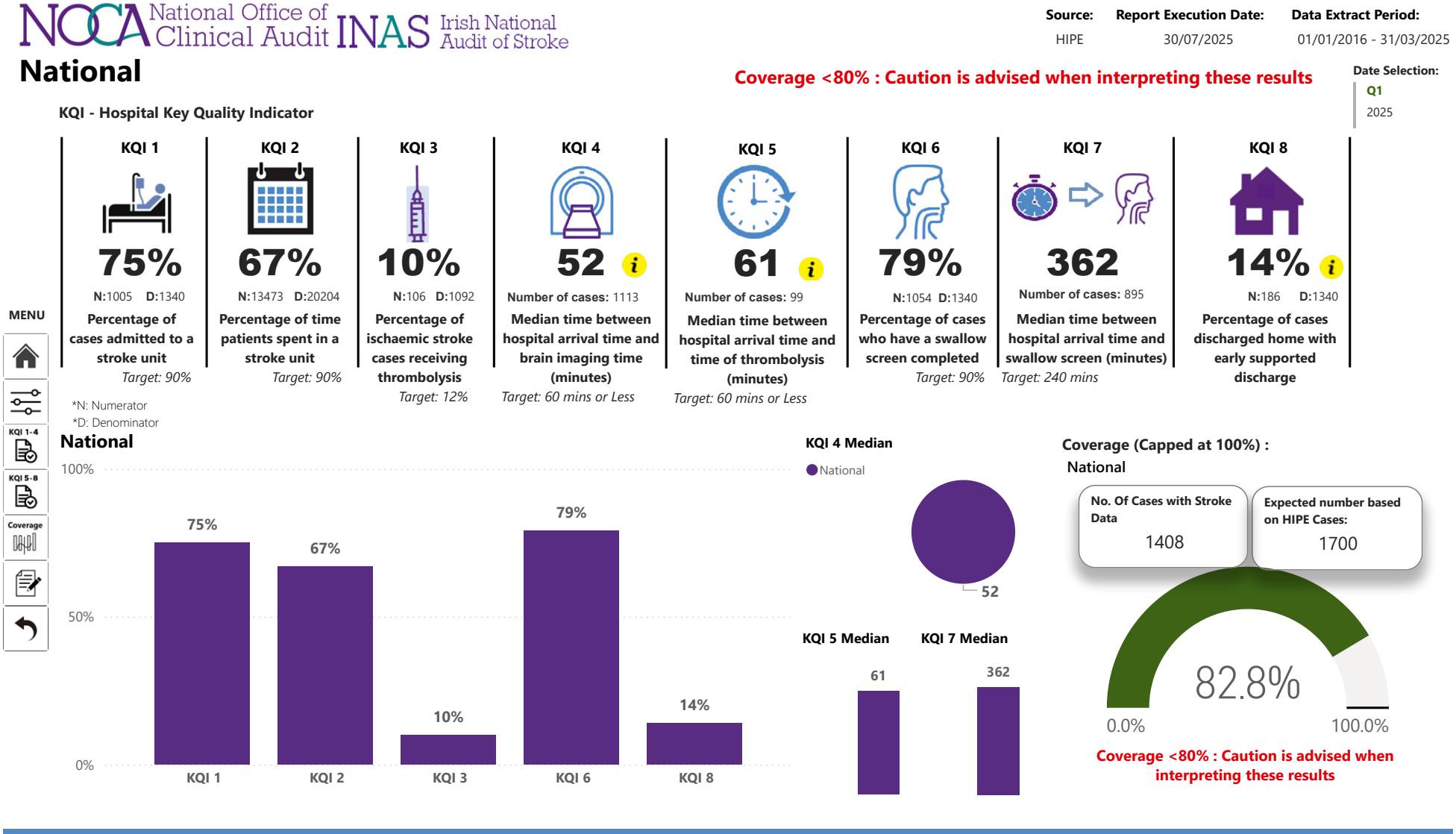



**FIGURE 9.1:** IRISH NATIONAL AUDIT OF STROKE INTERACTIVE DASHBOARD, 2024

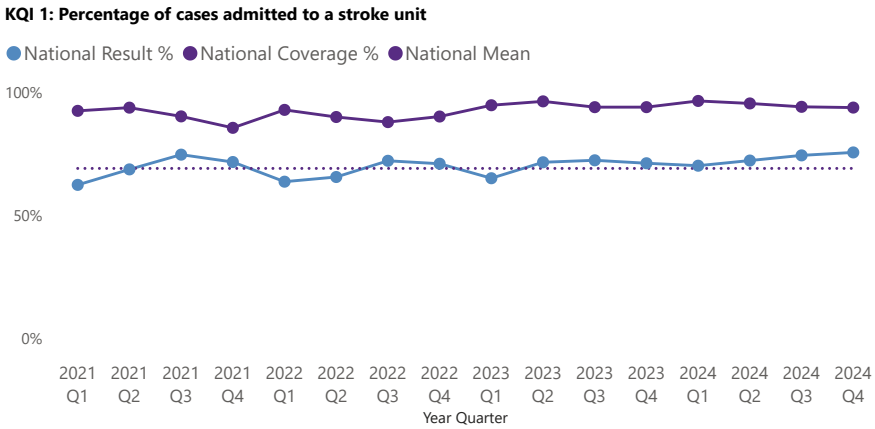



**FIGURE 9.2:** KEY QUALITY INDICATOR 1: PERCENTAGE OF CASES ADMITTED TO A STROKE UNIT

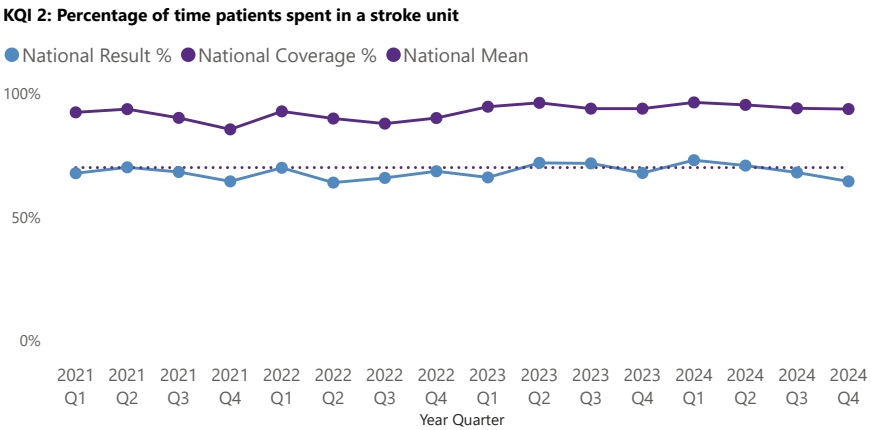



**FIGURE 9.3:** KEY QUALITY INDICATOR 2: PERCENTAGE OF TIME PATIENTS SPEND IN A STROKE UNIT

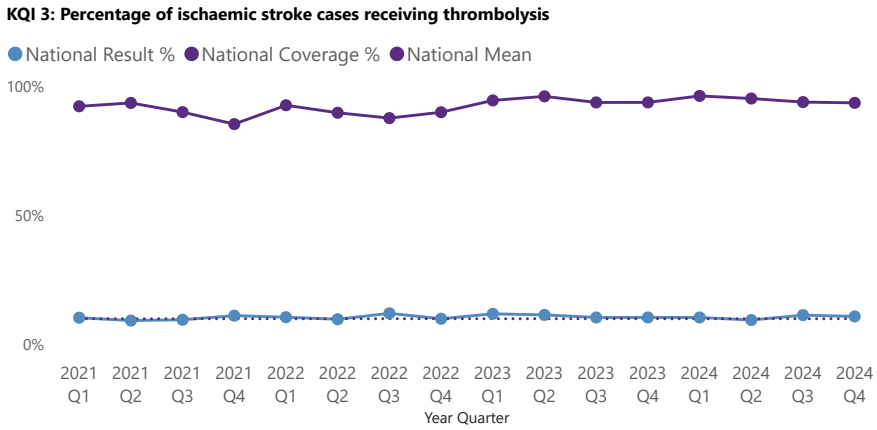



**FIGURE 9.4:** KEY QUALITY INDICATOR 3: PERCENTAGE OF PATIENTS WITH ISCHAEMIC STROKE WHO RECEIVE THROMBOLYSIS

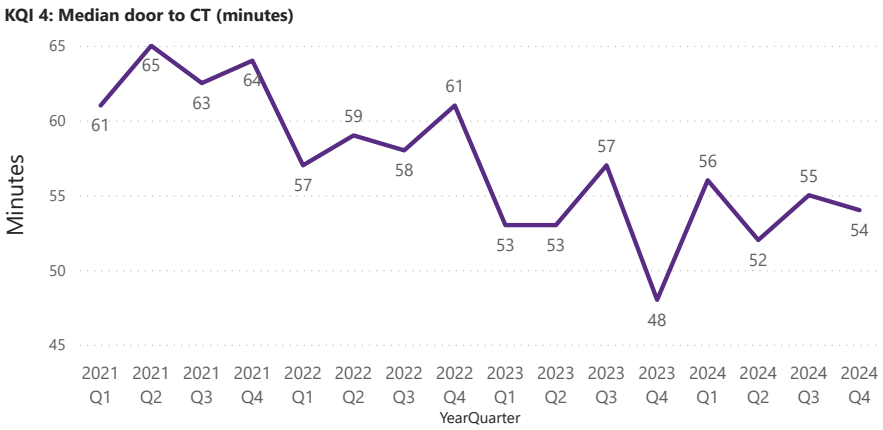



**FIGURE 9.5:** KEY QUALITY INDICATOR 4: NATIONAL MEDIAN TIME BETWEEN HOSPITAL ARRIVAL TIME AND BRAIN IMAGING TIME

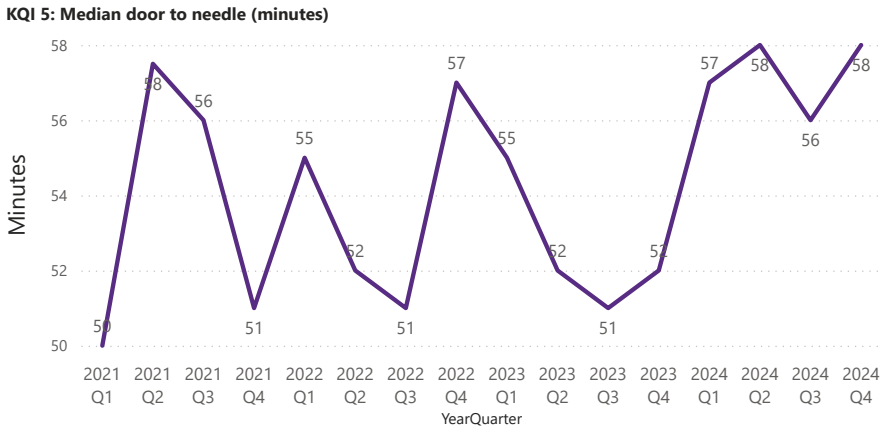



**FIGURE 9.6:** KEY QUALITY INDICATOR 5: NATIONAL MEDIAN TIME BETWEEN HOSPITAL ARRIVAL TIME AND TIME OF THROMBOLYSIS

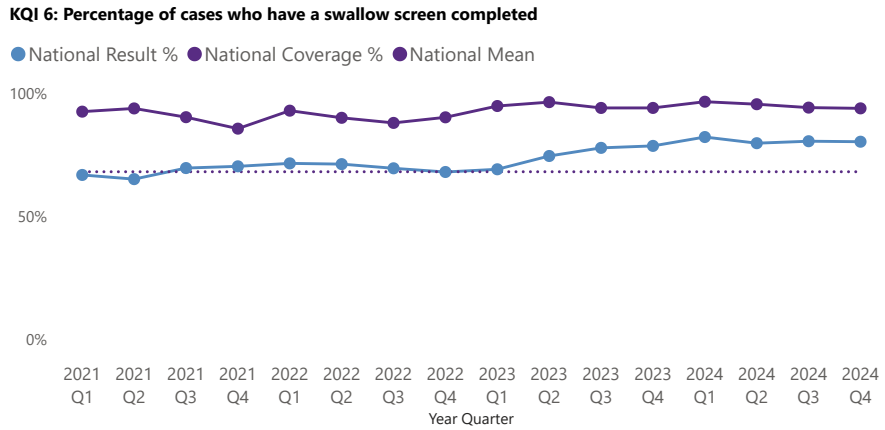



**FIGURE 9.7:** KEY QUALITY INDICATOR 6: PERCENTAGE OF CASES WHO HAVE A SWALLOW SCREEN COMPLETED

# BEAUMONT HOSPITAL QI PROJECT

## FAST BUTTON QI PROJECT

### INTRODUCTION

In 2024, analysis of both inpatient and emergency department (ED) FAST (Face, Arms, Speech, Time) calls identified 1,498 FAST (Face, Arms, Speech, Time) call activations. During the first quarter, 10.2% of these activations were identified as 'phantom' FAST calls, meaning they were triggered without a specified location, leading to delays in stroke team activation, assessment, and treatment. To address these issues, a Quality Improvement (QI) project was initiated with the goal of enhancing the accuracy and speed of stroke alerts to support timely stroke recognition and management.

### AIM

This multidisciplinary initiative aims to reduce delays in stroke response and improve outcomes for patients with a stroke by providing clearer communication for FAST alerts, simplified processes in the ED and targeted education of the at-risk population.

### KEY INTERVENTIONS INCLUDED:

- Technology upgrade: New licensing was obtained to implement a FAST alert button with pre-recorded location-specific messages, modelled after the existing cardiac arrest alert system.
- Process simplification in the ED: The stroke team collaborated with the ED to switch its alert number to 7777, enabling quicker and more consistent pre-alerts.
- Educational campaign: The stroke team partnered with local art and design students to create an updated poster to raise awareness of FAST as an indicator of stroke.
- The new, educational design includes clear messaging about the revised alert process, aiming to raise awareness and promote adherence to the improved system.




### RESULTS

The new FAST button system was implemented in May 2025, with data collected over the following three months and compared with Q1 2024. Post-implementation results demonstrated a reduction in 'phantom' FAST calls from 10.2% to 1.7%. The remaining errors were primarily associated with wards continuing to use the old activation number, leading to repeat education and reinforcement of the updated process.

## CONNOLLY HOSPITAL QI PROJECT[35]

# PUTTING THEORY INTO PRACTICE: 10 WEEK "FAST" STROKE SIMULATION TRAINING ON THE ACUTE STROKE UNIT

## INTRODUCTION

Stroke is a medical emergency which requires trained staff to act fast to save time, promoting optimum patient outcomes. Two million brain cells die every minute when a stroke event occurs, illustrating the importance of acting fast: hence, the term "Time is brain". Nurses and healthcare assistants (HCAs) are part of the healthcare team who will be observing the patient consistently over a 24-hour basis, 7 days a week. It is well researched that simulation training bridges the gap between theory and practice for healthcare workers, especially when it comes to responding to emergencies (Moslehi *et al*., 2022).

## AIM

- Improve recognition of FAST as an indicator of stroke
- Role and task definition
- teamwork
- practical learning.

## METHOD

A 10-week simulation training programme took place from June to August 2024, with sessions every Thursday 15.00–16.00. Physiotherapists and occupational therapists attended this training in addition to those who work primarily in stroke care. Nursing colleagues covered the ward to allow programme attendees protected time for training. Topics covered by the programme included hypertensive bleed, thrombolysis, thrombectomy, hypoperfusion event, capsular warning syndrome, transient ischaemic attack (TIA), FAST with no emergency intervention and stroke mimic.

## RESULTS

- overall attendance by nurses = 94% (n=29; N=31)
- nurses who attended three or more sessions = 41% (n=12)
- nurses who attended four or more sessions = 17% (n=5)
- attendance by HCAs = 73% (n=8; N=11).

Simulations during the programme were some participants' first experience of experiencing a FAST call. Improved understanding of individual roles, appropriate delegation of tasks and clear communication in escalating care was evident among programme participants by the end of the training. Participants demonstrated understanding of the importance of onset time of a stroke event, as well as the use of the term 'FAST positive' to designate a call as a medical emergency and escalate the urgency of the response.

## CONCLUSION

The stroke simulation training programme improved communication, teamwork and understanding of individual roles in responding to a FAST call among programme participants, promoting optimum patient outcomes. Monthly simulation training will be implemented to maintain best practice among stroke workers.

[35] The content of this project has been modified from an abstract in the report Irish Heart Foundation Stroke Study Day, which can be accessed at https://ihfstrokeconference2024.ie/abstracts.pdf

# OUR LADY OF LOURDES HOSPITAL DROGHEDA QI PROJECT

## EARLY SUPPORTED DISCHARGE FOR STROKE: TURNING CHALLENGES INTO OUTCOMES

### BACKGROUND

The ESD service in OLOLH Drogheda was newly established in 2023. Most of the team transitioned from acute hospital care to community-based roles and had to learn new ways of working and communication. No standardised information tools available for ESD teams.

### CHALLENGES

Develop tools to provide clear and prompt communication between the stroke survivor, their families and ESD team

Ensure that the communication method was GDPR compliant maintaining the safety of all patient related information in a community setting.




**From left to right:** Claire Prendergast, Rachel Shekleton, Kim Martin, Michelle Mc Ardle, Joyce Taaffe

### METHODS

**INFORMATION GATHERING:**

- Collaborated with stroke survivors and their families, a Spark Innovation mentor and the digital innovation team within OLOLH.
- Completed 'design thinking' workshops to explore the patient journey from admission to hospital to discharge from the ESD team.
- Identified each point at which new information was shared with the stroke survivor and their family.
- Stroke survivors and their families requested uncomplicated and 'bite sized' information.

**DEVELOPMENT OF EDUCATIONAL MATERIALS:**

- A patient information leaflet on ESD benefits
- A referral criteria quick-reference guide for inpatient staff
- A bespoke stroke folder for each patient, keeping record of rehabilitation goals, therapy notes, secondary prevention, appointments, etc.

**DIGITAL TRANSFORMATION:**

- The QI project was selected to be a Sláintecare Transformation and Innovation Seedling Project, along with MyPatientSpace (MPS)
- All information materials were digitised and integrated into the MPS app.
- The GDPR-compliant digitisation project ensures secure, remote documentation by ESD team members.

### OUTCOMES

**NATIONAL STANDARDISATION AND RECOGNITION:**

- Materials have been professionally designed and branded for national use.
- They are shared across all ESD teams in Ireland to ensure consistency.
- The initiative was a finalist for Best Design Led Project at the Spark Summit



# 10. AUDIT UPDATE

# 10: AUDIT UPDATE

## UPDATE ON RECOMMENDATIONS

Table 10.1 displays an update on recommendations from the *Irish National Audit of Stroke National Report 2020* (NOCA, 2022a), the *Irish National Audit of Stroke: A critical review of national stroke data for Ireland from 2013 to 2021* (NOCA, 2023a), the *Irish National Audit of Stroke National Report 2022* (NOCA, 2023b) and the *Irish National Audit of Stroke National Report 2023* (NOCA, 2025).

**TABLE 10.1:** RECOMMENDATIONS UPDATES

| RECOMMENDATIONS FOR THE NOCA | STATUS | UPDATE |
|---|---|---|
| Increase the participation of health and social care professionals (HSCPs) in the HSCP dataset within the INAS (NOCA, 2022a). | Ongoing | **Action on this recommendation is in progress. Since 2022, there has been an occupational therapist (OT) and a speech and language therapist (SLT) representing each of their professional bodies in support of the INAS HSCP representative. These representatives continue to champion the implementation of the HSCP dataset in all hospitals participating in the INAS. The number of hospitals submitting data to the HSCP dataset in 2024 was 19, an increase from 18 hospitals in 2023. The total number of cases submitted increased from 3,256 in 2022, to 3,660 in 2023, to 3,791 in 2024. The INAS National Reporting Table 2024 presents the cases submitted by each participating discipline, by hospital. Less than 80% of INAS cases have additional HSCP data submitted by HSCPs, although this varies by hospital. As such, only national results were published.** |
| Engage with the Healthcare Pricing Office (HPO) to assess how access to patients' individual health identifiers (IHIs) as part of the Hospital In-Patient Enquiry (HIPE) case/stroke audit portal could assist in tracking patients with stroke as they access care in different hospitals (NOCA, 2023a). | Ongoing | **NOCA is engaging with the HSE Health Identifiers Service Team in conjunction with the HSE HPO in order to gain permission for NOCA to access patients' IHIs in order to facilitate the audit.** |
| Develop a best practice tariff for acute stroke care (NOCA, 2023b). | Ongoing | **The NCP for Stroke is currently engaged in a consultation process with its Clinical Advisory Group on potential items to include in a best practice tariff. A subgroup has been established, and an initial draft of standards has been developed and shared with the Clinical Advisory Group for approval. NOCA will work with the NCP for Stroke as well as the HPO to develop the methodology for a best practice tariff for all participating hospitals. This recommendation is dependent on access to funding to support a best practice tariff.** |
| Complete an organisational survey of all hospitals providing acute stroke care. | Completed | **The *Irish National Audit of Stroke: Organisational Audit Report 2025* was completed and published in 2025.** |

**TABLE 10.1:** RECOMMENDATIONS UPDATES *CONTINUED*

| RECOMMENDATIONS FOR THE NCP FOR STROKE | STATUS | UPDATE |
|---|---|---|
| Improve the level of swallow screening for patients with a stroke (NOCA, 2022b). | Ongoing | **The first phase of the Swallow Screening in Acute Stroke: National Quality Improvement Project, led by the NCP for Stroke and commenced in 2023, has been completed. This phase included the development of a swallow screening e-learning programme, as well as the development almost to completion of a follow-up learning impact study. As a result of these projects, the proportion of patients with a stroke who receive a swallow screening has increased from 68% in 2021 to 71% in 2022, 77% in 2023 and 82% in 2024. However, the proportion of patients with a stroke who receive a swallow screening within 4 hours of hospital arrival has decreased, and was 19% in 2024.**<br>**Changes have been made to the INAS dataset to incorporate the date and time of the swallow screening, and reporting of this commenced in 2025. This will give a local and national baseline time of when a swallow screening is completed in relation to hospital arrival. This data will be reviewed in 2026, and a decision will be made on next steps to address the results.** |
| All stroke services should have access to a clinical neuropsychologist/psychologist as part of a specialist multidisciplinary team (MDT) providing care to patients with a stroke (NOCA, 2022b). | In progress | **The NCP for Stroke has secured funding for five whole-time equivalent (WTE) neuropsychologist/psychologist roles in 2025. This will improve patients' access to post-stroke psychology in seven sites (two of the WTE quotas are divided into four 0.5 WTE roles). Posts are with local sites at present for recruitment.** |
| The number of stroke unit beds should be increased so that at least 90% of patients with a stroke are cared for in a stroke unit (NOCA, 2023a). | In progress | **Since 2021, there has been a 2% increase in the number of stroke unit beds, and at the time of publication of the *Irish National Audit of Stroke National Report 2024 and Organisational Audit Report 2025* only 60% of patients with a stroke had access to a stroke unit bed, a decrease from 70% in 2021. The report recommends that hospital beds be reorganised to designate a set number of beds to the stroke unit. The NCP for Stroke continues to schedule site visits to acute stroke centres across Ireland. These involve meeting each hospital's director of stroke services and executive management in order to review key quality indicators (KQIs), the local requirements for increased stroke bed designation and a timeline for increasing bed numbers as recommended by the NCP for Stroke.** |
| Increase the number of ESD teams (NOCA, 2023a). | In progress | **The number of ESD teams has increased from 10 in 2021 to 13 in 2025. The proportion of patients discharged home with ESD has also increased from 9% in 2023 to 11% in 2024. However, there are many gaps in resourcing and filling of specialist staff within ESD teams (see Chapter 7).**<br>**The NCP for Stroke secured funding for 24 WTE staff for ESD teams in 2025. There will be four new teams – one each in Letterkenny University Hospital, University Hospital Waterford, Regional Hospital Mullingar and Naas General Hospital – as well as uplifts to six existing teams.** |
| Opportunistic screening for atrial fibrillation (AF) should be carried out for all people aged 65 years and over (NOCA, 2023a). | In progress | **The Stroke Prevention and Atrial Fibrillation Ireland (SPAFI) working group is reconvening, and it aims to consider the European Society of Cardiology's most recent guidelines on AF (Gelder *et al*., 2024) and hypertension (McEvoy *et al*., 2024) and how these can be incorporated into national practice and clinical pathways.** |
| Clinicians and patients should be provided with guidance as to the importance of adherence to anticoagulation therapy in order to avoid strokes (NOCA, 2023a). | In progress | **The SPAFI working group is reconvening, and it aims to evaluate how the European Society of Cardiology's most recent guidelines on AF (Gelder *et al*., 2024) and hypertension (McEvoy *et al*., 2024) can be incorporated into national practice and clinical pathways.** |

# AUDIT DEVELOPMENT

## The INAS National Reporting Table

The INAS National Reporting Table 2024 compiles national stroke data for 2022, 2023 and 2024 in one table, in order to facilitate year-on-year trends.

## The INAS dashboard

Two amendments will be made to the INAS dashboard in 2025:

1. An additional KQI will be added to report the proportion of patients with a stroke discharged home with ESD.
2. KQI 7, 'Percentage of cases who have a swallow screen completed within 4 hours of hospital admission', will be replaced by 'Median time from hospital arrival to swallow screening'.

This change aligns the KQI with clinical guidelines, which states that a swallow screen should be completed as soon as possible and within 4 hours of hospital admission (Intercollegiate Stroke Working Party, 2023). Reporting the median time from hospital admission to screening offers a more accurate measure of overall timeliness of the procedure. It also better supports continuous improvement by highlighting how quickly patients are typically assessed, rather than focusing solely on the hospital's compliance with a time threshold.

## Maximising the Quality of Stroke Care in Ireland – Development of a National Stroke Audit

The INAS has been engaged in a research project that aims both to develop a core minimum dataset for use in the INAS and to improve the standard of stroke care in Ireland. Bruen *et al*. (2021) describe the scoping review protocol, and, although the protocol has not yet been published, the agreed additional data items have been finalised. The INAS will follow the NOCA change management procedure for this project. A multidisciplinary dataset revision group has been established, and a data dictionary for the new items has been drafted. The dataset will be reviewed by the Health Service Executive's (HSE's) Data Specification Management Process group, and it will be piloted in two hospitals in Q4 2025. It is envisioned that this will be completed and ready to implement nationally in January 2026.

## Federating European Registries for Stroke

The INAS continues to work on the Federating European REgistries for Stroke (FERES) project as described in the *Irish National Audit of Stroke National Report 2023* (NOCA, 2025). Data sharing agreements have been signed, and the Data Analytics and Research team in NOCA is working with the FERES analytical team in order to align the required data points. Test data have been shared with the FERES analytical team, and the INAS team will be users of the system in Q3 2025.

## National endovascular thrombectomy (EVT) reporting

From 2026, the INAS will take over governance of reporting on the data from the two EVT centres, Beaumont Hospital and Cork University Hospital. The INAS will complete a standalone report in tandem with its annual national reports.

## PUBLICATIONS


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## ABSTRACTS[36]


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[36] In order to access each abstract, open the link and select the PDF/EPUB tab. When downloaded, search for the first author's name in the search box.



# 11. RECOMMENDATIONS

# 11. RECOMMENDATIONS

## RECOMMENDATION 1

### ALL STROKE UNITS SHOULD HAVE CONTINUOUS ACCESS TO A CONSULTANT PHYSICIAN WITH EXPERTISE IN STROKE MEDICINE, WITH CONSULTANT REVIEW 5 DAYS PER WEEK

| Rationale |
|---|
| Clinical leadership plays a pivotal role in the delivery of evidence-based care in hospitals managing acute stroke, contributing to improved patient outcomes and system performance. An acute stroke unit should have continuous access to a consultant physician with expertise in stroke medicine, with consultant review 5 days per week (Intercollegiate Stroke Working Party, 2023). The *Irish National Audit of Stroke National Report 2024 and Organisational Audit Report 2025* has identified notable gaps in the provision of consultant physicians with specific expertise in stroke care across several hospital sites. It could be determined that some hospitals do not meet the core requirements to be formally designated as having a stroke unit, as without sufficient specialist medical input they may be unable to deliver care in line with national guidelines or achieve the standards expected of stroke units.<br><br>The majority of hospitals (n=22; 92%) reported having access to a consultant physician with specialist knowledge of stroke who is formally recognised as having principal responsibility for stroke services. However, continuous access to a consultant physician with expertise in stroke medicine is not widely available. Throughout the country there is variation in the composition and availability of medical stroke teams in hospitals that provide acute stroke care. Fewer than one-half (n=11; 46%) of all hospitals have on-call stroke teams available 24 hours a day, 7 days a week; 6 hospitals (25%) have on-call stroke teams available Monday–Friday, 9.00am–5.00pm; and 7 hospitals (29%) do not have on-call stroke teams (Table 5.3). Fewer than one-half of all hospitals (n=11; 46%) report having a specialist stroke service that works independently of other roles or responsibilities.<br><br>A number of medical specialties – including geriatric medicine, neurology, general medicine and clinical pharmacology – contribute to providing stroke service cover in the hospitals surveyed. Most stroke service cover is provided by geriatric medicine, both during normal working hours (n=20; 83%) and out of hours (n=16; 67%). Eleven hospitals (46%) report that general medical teams also provide out-of-hours stroke service cover. One-quarter of hospitals (n=6) report that patients with a stroke are not transferred to the care of a stroke consultant after admission.<br><br>Access to stroke consultant level decision-making varies between hospitals. While the decision to proceed with thrombolysis is generally made at consultant level, it is done by a stroke consultant in only 15 hospitals (63%). Only 10 hospitals (42%) report that consultant-led ward rounds occur daily, either 5 or 7 times per week, and 2 hospitals (8%) report that consultant-led ward rounds do not occur regularly. Four hospitals (17%) have ward rounds up to 60 times per week, reflecting the large number of consultants who provide care to stroke patients. |

| What actions should be taken | Who is responsible for implementation? | When should this be implemented? |
|---|---|---|
| In order to ensure consistent, high-quality and timely care for all stroke patients, a workforce planning review to determine specific gaps in the provision of medical stroke services across all hospitals should be undertaken, as recommended in the *National Stroke Strategy 2022-2027* (NSS) (HSE, 2022). | NCP for Stroke | As soon as possible |

## Evidence that the action will be effective

There is strong, high-quality evidence that stroke patients cared for within dedicated stroke units – units staffed by stroke consultants and specialist MDTs – have significantly better outcomes than those cared for in general medical wards. Mounting data demonstrate that having on-site stroke consultants and a structured stroke unit leads to:

- lower death rates
- improved functional recovery
- fewer complications and institutionalisations
- better implementation of best practice care
- shorter hospital stays.

(Langhorne *et al*., 2020)

## Who will benefit from this recommendation?

All patients with stroke will benefit from having access to high-quality stroke unit care.

Hospitals providing acute stroke care will benefit from increased clinical leadership through the implementation of evidence-based practices in acute stroke care, which will support optimal outcomes and adherence to clinical guidelines in hospital settings.

## RECOMMENDATION 2

### HOSPITALS THAT ADMIT PATIENTS WITH ACUTE STROKE SHOULD ENSURE THAT A SUFFICIENT NUMBER OF DESIGNATED STROKE UNIT BEDS ARE AVAILABLE IN ORDER TO PROVIDE HIGH-QUALITY STROKE CARE.

#### Rationale

To ensure optimal outcomes for patients with stroke, it is essential that hospitals admitting such patients maintain adequate infrastructure and resources for stroke care. Central to this is the provision of designated stroke unit beds, which are critical for delivering evidence-based, high-quality stroke care. In 2025, there was a 13% increase in the number of patients admitted with stroke; however, the number of stroke unit beds only increased by 2%, from 239 in 2021 to 244 in 2025. Sixty percent of patients with a stroke had access to a stroke unit bed, a decrease from 70% in 2021, and only 54% of patients with a stroke were in a stroke unit bed at the time of the survey, far below the target of 90% as set out in the *Stroke Clinical Care Programme: Model of Care* (HSE, 2012). Findings from INAS clinical audits consistently indicate an admission rate to a stroke unit of 70% annually; however, patients with a stroke are spending less than 90% of their hospital stay in a stroke unit (NOCA, 2025; NOCA 2023a). These findings highlight an urgent need to reallocate beds within hospitals to ensure that all patients with stroke receive evidence-based organised stroke care.

| What actions should be taken | Who is responsible for implementation? | When should this be implemented? |
|---|---|---|
| Hospital managers should prioritise the allocation and maintenance of a sufficient number of stroke unit beds in order to meet demand and adhere to best practice standards in stroke management. | Regional executive officers<br>Hospital managers | As soon as possible |

#### Evidence that the action will be effective

There is strong, high-quality evidence that stroke patients cared for within dedicated stroke units have significantly better outcomes than those cared for in general medical wards (Langhorne *et al*., 2020).

#### Who will benefit from this recommendation?

All patients with a stroke will benefit from having access to high-quality stroke unit care.

MDTs will benefit from having an environment of interdisciplinary teamwork and learning.

Hospital management will benefit from a commitment to ensure that all patients with a stroke receive timely, evidence-based care in accordance with national clinical guidelines. This approach supports optimal patient outcomes, continuous quality improvement (QI) and compliance with healthcare standards.

## RECOMMENDATION 3

### ALL STROKE UNITS SHOULD BE RESOURCED TO PROVIDE STROKE SPECIALIST REHABILITATION.

**Rationale**

Recommendations regarding the appropriate health and social care professional (HSCP) staffing ratios in stroke units are documented in the NSS (HSE, 2022). In 2025, critical staffing deficits were observed across all roles in the stroke unit MDT. Physiotherapy operated with a 48% deficit, occupational therapy with a 54% deficit, and speech and language therapy with a 23% deficit. More severe shortages were seen in dietetics (65%), psychology (74%) and medical social work (76%). These deficits severely limit the capacity of MDTs to provide comprehensive and coordinated care. Findings from the INAS HSCP data indicate that only one-half of physiotherapists (PTs) reported that their patients received a sufficient amount of therapy (50%). This figure was similar for speech and language therapists (SLTs), at 49%. Occupational therapists (OTs) reported even lower levels, with just 40% of patients receiving what was considered a sufficient amount of therapy. The broad scale of these shortages underscores the urgent need for strategic workforce planning, investment in training and retention, and innovative approaches to service delivery in order to build and sustain the multidisciplinary workforce within stroke services.

| What actions should be taken | Who is responsible for implementation? | When should this be implemented? |
|---|---|---|
| The NSS (HSE, 2022) adopts a stratified, staged approach to achieving optimal staffing levels across stroke services. This framework enables hospitals to understand both the human resource requirements and the indicative budgetary implications associated with appropriately staffing their stroke services over a defined 3-year period. The strategy has been formally endorsed by the HSE, and it is strongly recommended that hospitals prioritise the implementation of this component of the NSS in order to ensure timely and effective delivery of stroke care. | The NCP for Stroke | 2025–2027 |

**Evidence that the action will be effective**

A meta-review of stroke rehabilitation found that the amount of therapy time, regardless of the specific type, was a key factor in reducing activity limitations and facilitating recovery (Clark *et al*., 2021).

**Who will benefit from this recommendation?**

Most patients with stroke can benefit from increased access to stroke therapists, as expert, timely and intensive rehabilitation is associated with improved recovery and functional outcomes.

## RECOMMENDATION 4

### STROKE UNITS MUST BE STAFFED WITH NURSES WITH SPECIAL INTEREST, TRAINING AND EXPERTISE IN STROKE CARE.

#### Rationale

As in 2021, this report compares the actual number of nurses, both registered general nurses (RGNs) and healthcare assistants (HCAs), in each stroke unit against the recommended staffing levels outlined by the European Stroke Organisation (ESO) (Ringelstein *et al.,* 2013). In 2025, 19 stroke units (79%) operated below the recommended nurse staffing levels, marking a slight improvement from 2021, when 21 units were under-resourced. Nationally, 132 nurses (comprising 99.5 RGNs and 32.5 HCAs) were allocated to stroke units per 24-hour period, compared with the 191 recommended by the ESO. This equates to 69% of the recommended staffing level, resulting in a 31% shortfall. Within Ireland, nurse staffing in acute stroke units is guided by the nationally endorsed *Framework for Safe Nurse Staffing and Skill Mix in General and Specialist Medical and Surgical Care Settings in Adult Hospitals in Ireland 2018* (Department of Health, 2018). This framework, implemented across adult acute hospitals, ensures that staffing reflects real-time patient acuity and dependency.

| What actions should be taken | Who is responsible for implementation? | When should this be implemented? |
|---|---|---|
| The NCP for Stroke should continue to collaborate closely with the National Lead for Safe Nurse Staffing and Skill Mix within the Office of the Nursing and Midwifery Services Director (ONMSD). There should be ongoing collaboration between the NCP for Stroke, individual hospital sites and the ONMSD to deliver the Safe Staffing Framework.<br>Stroke units/wards should continue to use the methodology described in the *Framework for Safe Nurse Staffing and Skill Mix in General and Specialist Medical and Surgical Care Settings in Adult Hospital in Ireland 2018* to identify their workforce requirements.<br>Biannual audits should be carried out by the NCP for Stroke to reflect the:<br>1) nursing hours per patient day (NHpPD) required and the NHpPD available on stroke units in sites with TrendCare in operation<br>2) WTE nursing staff required and WTE nursing staff available in stroke units where TrendCare is not in operation. | NCP for Stroke | 2025–2026 |

#### Evidence that the action will be effective

All stroke units should have specialist nursing staff trained in the acute management of patients with a stroke. An experienced, dedicated nursing workforce, with expertise in caring for patients with transient ischaemic attack (TIA) and stroke is a necessity to ensure the highest quality of care for patients within the context of the MDT (HSE, 2022). Systematic reviews show low nurse-to-patient ratios raise the risk of medication errors, hospital-acquired infections, pneumonia and falls, all critical complications for vulnerable stroke patients (Dall'Ora *et al*., 2022; Aiken, *et al*., 2011). NHpPD is a measure of the number of nursing care hours each patient needs in a 24-hour period. It reflects the complexity, acuity and dependency of the patient group and is used by hospitals to align staffing levels with patients' actual care needs. NHpPD is central to the Safe Staffing Framework and underpins evidence-based workforce planning across acute hospital settings. A stable and sustainable workforce with the requisite education, training, skills and competence is vital to the delivery of safe patient care (Department of Health, 2018).

#### Who will benefit from this recommendation?

Patients who have experienced a stroke, as well as their loved ones, benefit when the nursing team is equipped with adequate resources to deliver high-quality, evidence-based stroke care.

Nurses will benefit from the stroke ward maintaining adequate nurse-to-patient ratios, a necessity to mitigate nurse burnout, which is closely linked to decreased job satisfaction, increased staff turnover and compromised patient care quality.

## RECOMMENDATION 5

**HOSPITALS SHOULD INCREASE THE NUMBER OF APPROPRIATELY RESOURCED ESD TEAMS IN ORDER TO IMPROVE ACCESS.**

### Rationale

ESD for stroke is an international model of best care for patients with a stroke who have milder levels of disability. The ESD model improves patient outcomes while facilitating a faster discharge home through the provision of stroke-specific rehabilitation in the home setting. Fourteen hospitals (58%) have access to an ESD team, an increase from 10 in 2021. Three teams have been newly established since 2022. All current ESD teams are resourced to provide physiotherapy, occupational therapy, and speech and language therapy services. However, some of these posts remain unfilled, which impacts service delivery. Notably, four ESD teams report an absence of SLTs within their teams. More significant staffing deficits are evident in other key roles. Clinical nurse specialists (CNSs) and medical social workers (MSWs) are not resourced in approximately 50% of ESD teams, which may limit the multidisciplinary support available to patients. Furthermore, four teams lack therapy assistants, who provide valuable support to core therapists, which could potentially affect the efficiency and capacity of therapy services. Addressing these staffing gaps is essential in order to ensure comprehensive multidisciplinary care and optimise patient outcomes across all ESD teams.

| What actions should be taken | Who is responsible for implementation? | When should this be implemented? |
|---|---|---|
| The goal of the NSS is to have 21 ESD teams in place, covering 92% of stroke services, by the end of 2025 (HSE, 2022). The strategy has been formally endorsed by the HSE, and it is strongly recommended that this component of the NSS be prioritised in order to ensure timely and effective delivery of stroke care.<br><br>Once funding is provided, the recruitment process should proceed without delay. | NCP for Stroke<br><br>Regional executive officers | 2025–2027 |

### Evidence that the action will be effective

High-quality evidence across multiple randomised controlled trials and meta-analyses shows that ESD reduces death and dependency among patients, shortens hospital stay, improves functional outcomes and satisfaction, and is cost effective (Langhorne *et al*., 2020; Bautz-Holter *et al*., 2002).

### Who will benefit from this recommendation?

Patients with a stroke will benefit in that they will spend less time in hospital while at the same time receiving specialist stroke rehabilitation in the home. Families and/or caregivers will have more access to support, be more involved in rehabilitation goals and have reduced burden of responsibility on the patient's discharge from hospital.

Hospitals will benefit through cost savings, greater bed availability and improved efficiency of stroke services. ESD teams will benefit in that they will be able to provide effective, personalised rehabilitation in home settings.

## RECOMMENDATION 6

### ALL HOSPITALS THAT PROVIDE ACUTE STROKE SERVICES SHOULD ENSURE THAT THERE IS A STROKE SERVICE GOVERNANCE COMMITTEE.

#### Rationale

Stroke services should develop a culture of continuous QI, and attention to good governance is mandatory. Clinicians providing care for people with a stroke should participate in the national stroke audit to enable the clinical and organisational quality of their services to be compared with national standards, and for the findings to be used to plan and deliver service improvements (Intercollegiate Stroke Working Party, 2023). Five hospitals (21%) reported that they did not have a stroke governance committee. Of the 19 hospitals (79%) that have a stroke governance committee, 16 committees meet on at least a quarterly basis and all 19 hospitals include the INAS reports as part of their committee agendas (Table 5.2).

In 2025, an increased access to high-tech brain imaging was seen (e.g. the availability of computed tomography perfusion (CTP) imaging in emergency departments (EDs) has grown, with nine hospitals (38%) now equipped, compared with five in 2021). While modern technologies are a cornerstone of contemporary stroke care, enabling a tissue-based approach to the selection of patients for thrombolysis and thrombectomy and extending treatment beyond traditional time-based criteria, the benefits of advanced imaging must be supported by standardised clinical protocols, targeted staff training, automated imaging analysis and a robust governance framework. These components are essential for ensuring patient safety, consistent care delivery and optimal clinical outcomes. The endovascular thrombectomy (EVT) centres hold regional MDT meetings to discuss patients who have undergone thrombectomy. In 2025, only 11 hospitals (52%) reported that most patients who have been referred for thrombectomy are reviewed at these regional MDT meetings.

| What actions should be taken | Who is responsible for implementation? | When should this be implemented? |
|---|---|---|
| Each hospital providing an acute stroke service should have a multidisciplinary stroke governance committee.<br>The stroke governance committee should:<br>• have formal terms of reference<br>• meet on a quarterly basis<br>• engage in QI education and training<br>• identify areas for QI utilising local and national stroke data to monitor performance<br>• ensure adherence to standardised clinical protocols and guidelines<br>• ensure availability of staff training and education. | Regional executive officers | As soon as possible |
| National Quality and Patient Safety can signpost services to QI training and supports to enable the building of this capacity and capability.<br>The NCP for Stroke Clinical Advisory Group should draft a template of terms and references for stroke governance committees in order to ensure consistency in all stroke services | The NCP for Stroke Clinical Advisory Group | |

#### Evidence that the action will be effective

Clinical governance helps ensure that people receive the care they need in a safe, nurturing, open and just environment arising from corporate accountability for clinical performance. The benefit of clinical governance rests in improved patient experiences and better health outcomes in terms of quality and safety. This has resulted in the clinical governance approach being widely adopted internationally (HSE, 2012).

#### Who will benefit from this recommendation?

Good clinical governance ensures increased accountability, quality improvement, and patient safety, which positively impacts everyone connected to healthcare.

## RECOMMENDATION 7

### ALL PATIENTS WITH A STROKE SHOULD HAVE ACCESS TO ROUTINE AND ADVANCED IMAGING AT ALL TIMES.

**Rationale**

As in 2021, all hospitals reported that they have access to CT imaging for patients in the ED. Despite this, only 17 hospitals (71%) can routinely get a CT scan performed on all patients with a suspected stroke within 60 minutes of the request. Almost all (n=22) hospitals have access to multiphase CT angiography (CTA), but only nine hospitals (38%) have access to CTP for patients in the ED. Twenty-three hospitals (96%) have access to magnetic resonance imaging (MRI), an increase from 22 in 2021. However, only five hospitals (22%) report that they have access to MRI scanning out of hours. Twenty-two hospitals (92%) report that they have access to the National Integrated Medical Imaging System (NIMIS) within the stroke service, but only 17 hospitals (71%) use it during the out-of-hours period. The NSS (HSE, 2022) recommends that all hospitals receiving patients with acute stroke must have access to CT and multi-phase CTA on a 24/7 basis in order to facilitate decision-making regarding thrombolysis and thrombectomy.

| What actions should be taken | Who is responsible for implementation? | When should this be implemented? |
|---|---|---|
| All clinicians should always have prompt access to CTA for all stroke patients. | Regional executive officers | As soon as possible |
| Clinicians participating in the shared care of stroke patients, including those at EVT centres and referring hospitals, should have access to diagnostic imaging from all hospitals via the NIMIS. | | |
| The NCP for Stroke should, as recommended in the NSS (HSE, 2022), work with the National Radiology Quality Improvement Programme to agree a plan to allow for equivalent access for all patients with a stroke to appropriate and advanced imaging, 24 hours a day, 7 days a week. | NCP for Stroke | |

**Evidence that the action will be effective**

Current guidance recommends that all acute stroke services should have continuous (i.e., 24/7) access to brain imaging, including CT or magnetic resonance angiography (MRA) and perfusion when necessary, and should be capable of undertaking immediate brain imaging when clinically indicated (Intercollegiate Stroke Working Party, 2023).

**Who will benefit from this recommendation?**

All patients with a stroke in all hospitals that treat acute stroke.

## RECOMMENDATION 8

**NATIONAL AGREEMENT ON HOW THE DEFINITION OF STROKE SHOULD BE CLASSIFIED SHOULD BE PRIORITISED.**

### Rationale

Stroke is defined according to two classifications:

1. World Health Organization (WHO) definition: Rapidly developing clinical signs of focal (or global) disturbance of cerebral function, lasting more than 24 hours or leading to death, with no apparent cause other than that of vascular origin.
2. American Heart Association (AHA)/American Stroke Association (ASA) definition: Infarction based on pathological, imaging or other objective evidence of infarction. In the absence of this evidence, the persistence of symptoms for at least 24 hours or until death can be used to define ischaemic stroke.

In 2025, 14 hospitals (58%) reported that they use the AHA/ASA definition of stroke, and 10 (42%) reported that they use the WHO definition. However, more than one-half of the hospitals (n=13) use a different definition of stroke than they did in 2021, suggesting hospitals might be diagnosing stroke using both definitions and, possibly, on a case-by-case basis.

| What actions should be taken | Who is responsible for implementation? | When should this be implemented? |
|---|---|---|
| A national agreement on the definition of stroke should be prioritised in order to ensure consistency in diagnosis, reporting, treatment and research. | The NCP for Stroke Clinical Advisory Group | As soon as possible |

### Evidence that the action will be effective

Inconsistencies in clinical and imaging criteria for stroke and TIA across institutions result in variable diagnoses and care pathways (Sacco *et al.*, 2013). Without a national consensus on the definition of stroke, discrepancies in care may persist, contributing to mismanagement and poorer outcomes.

### Who will benefit from this recommendation?

All clinicians and patients will benefit from clarity on how stroke is defined, as this will ensure consistency in diagnosis and treatment.

The healthcare system will benefit from a clear differentiation between stroke, TIA and stroke mimics, which can impact on case mix and consequently activity reports, audit results and outcomes.

# LEARNINGS AND CONSIDERATIONS

## Rapid assessment for TIA

The vision of the NCP for Stroke has consistently been to establish national access to rapid assessment for TIA (HSE, 2012). However, as of 2021, the majority of hospitals (n=23; 96%) continue to routinely admit patients presenting with TIA to hospital. While the number of hospitals operating a dedicated TIA or neurovascular clinic has increased from four in 2021 to six (25%) in 2025, this still represents a minority. Given resource constraints, it is likely that not all hospitals have the capacity to establish and maintain a rapid-access TIA clinic. The NSS (HSE, 2022) recommends that access to such services should be available within hospital networks, rather than individual hospitals each being meant to have their own. Emerging models of care, such as the HSE Integrated Care Hubs, may offer opportunities to reorganise services and manage this patient group in a more timely and equitable manner.

## National Clinical Guideline for Stroke for the United Kingdom and Ireland

The *National Clinical Guideline for Stroke for the United Kingdom and Ireland* (Intercollegiate Stroke Working Party, 2023) provides authoritative, evidence-based guidance aimed at improving the quality of care delivered to every adult who experiences a stroke in the UK and Ireland, regardless of age, gender, type of stroke, location or any other characteristic. Throughout the analysis in this report, we have observed variation between hospitals in how acute stroke care is delivered. The reasons for this variation are multifaceted and can only be fully understood at the individual hospital level. While it is beyond the remit of this audit to map out the complete care pathway for patients with a stroke or to make specific recommendations, we strongly encourage all hospitals providing acute stroke care to ensure that an active stroke service governance committee is in place, as outlined in Recommendation 6. Furthermore, the 2023 guidelines (Intercollegiate Stroke Working Party, 2023) should be used as a key reference in the planning and delivery of stroke care services.



# 12. CONCLUSIONS

# 12. CONCLUSIONS

The process of audit and quality improvement (QI) in stroke mandates us to consider all areas where standards and recommendations for care exist. The publication of the *National Clinical Guideline for Stroke for the United Kingdom and Ireland* (Intercollegiate Stroke Working Party, 2023) has given us a coherent and evidence-based set of measures with which to gauge our performance. Standards relate to both process and organisation, and in 2025 we have been able to compare both against prior reports. We have found that there has been an increase in activity as well as an increase in resources, both in personnel and in stroke unit beds, since the last organisational audit in 2021. However, this has occurred in the context of a 13% increase in annual stroke numbers reported by the Hospital In-Patient Enquiry (HIPE) system over that time. We have noticed definite improvement in some areas – such as reduced time to imaging, increased swallow screening post-stroke and availability of ESD teams – all of which are important and encouraging. In other areas we seem to be keeping pace with the increase in activity, but not seeing the improvements in care that we would have hoped for in areas such as admission to stroke unit and timeliness of thrombolysis. The increased resourcing given to the NSS (HSE, 2022) in the last 18 months will hopefully enable a greater number of quality measures to be achieved in the next few years.

Among the priorities identified are the need to address the shortage of specialist consultants, especially in the west of Ireland and the Midlands. It is challenging not only to obtain approval for suitable posts but also to identify and train suitable doctors and structure workloads that will make the positions attractive and fillable, given the context of several unfilled posts in geriatric medicine and other disciplines. We also need to increase the number of stroke unit beds so that they are in line with the recommendations of the NSS. These do not necessarily need to be additional beds but a repurposing and specialisation of current capacity, with the associated training provided for all groups of clinical staff to meet national guideline mandated standards. Our recommendations – which emphasise in particular specialist stroke training among nursing staff, the group that interacts most frequently with patients, and whose role is vital in determining the medical and functional outcome of all patients with a stroke – are key to delivering quality patient care.

While these recommendations have previously largely emphasised the importance of acute stroke unit resource and bed capacity, there also needs to be a focus on the importance of specialist stroke and neurorehabilitation beds. This in association with increased resourcing of ESD teams and neurorehabilitation units will serve to lessen patients' length of stay in hospital, improve outcomes and reduce avoidable disability and dependence. All stroke services need robust governance structures, and we are strong proponents for local stroke governance committees with senior managerial input, as well as the ongoing collection of patient data. This will enable stroke services to function at peak capacity, resulting in the best patient outcomes. In addition, we need to review the national availability of advanced imaging – whether it is delivered 24/7 and in a timely fashion – and we need to consider what is needed in terms of additional resources, technology and changes in service organisation that would enable this to happen.

Finally, in 2026, INAS will undertake the task of implementing the changes recommended based on the results of a Health Research Board (HRB) funded research study, led by Professor Anne Hickey, to expand the INAS dataset. We will be working with our colleagues across Ireland to make and monitor these changes while continuing our role in collecting outcome data. We will also be collaborating with the NCP for Stroke in the development of neurovascular or TIA services, and are considering how to conduct an audit of other, less common stroke types such as subarachnoid haemorrhage. We are also considering a study of stroke in small, high-risk groups.

**"We believe that the full implementation of the NSS will strengthen primary prevention efforts, enable hospitals to deliver optimal acute stroke care and refocus services to ensure ongoing support for patients in the years following a stroke."**

We believe that the full implementation of the NSS will strengthen primary prevention efforts, enable hospitals to deliver optimal acute stroke care and refocus services to ensure ongoing support for patients in the years following a stroke.

We would like to extend our sincere thanks to everyone working in stroke services for their dedication to delivering high-quality stroke care. The positive impact of QI initiatives across the country is evident as they continue to foster shared learning and collaboration. We are especially grateful to all those who contribute to the INAS, and we hope that ongoing clinical audit reporting will continue to drive meaningful improvements in stroke care.



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# REFERENCES


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# ACCESSING REPORT APPENDICES

**National Office of Clinical Audit (2025)**
***Irish National Audit of Stroke National Report 2024 and Organisational Report 2025 - Appendices.***
**Dublin: National Office of Clinical Audit.**
**Available at: https://www.noca.ie/publications/publications-listing/P0/category/3**

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| **APPENDIX 2** | INAS GOVERNANCE COMMITTEE MEMBERSHIP AND MEETINGS | CLICK HERE |
| **APPENDIX 3** | INAS CLINICAL AUDIT METHODOLOGY 2024 | CLICK HERE |
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