

Irish National Audit of Stroke National Report 2022

AUTHOR(S)

Joe Harbison, Joan McCormack, Olga Byrch, Tim Cassidy, Marie Glynn, Margaret O'Connor, Claire Prendergast, Martin Quinn, Edel Wilson, Aisling Connolly, The National Office of Clinical Audit (NOCA), Irish National Audit of Stroke (INAS)

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IRISH NATIONAL AUDIT OF STROKE NATIONAL REPORT 2022 APPENDICES



APPENDIX 1: IRISH NATIONAL AUDIT OF STROKE METHODOLOGY 2022

BACKGROUND

In 2012, the National Stroke Programme (NSP) developed the National Stroke Register (NSR) in partnership with the Health Research and Information Division of the Economic and Social Research Institute (ESRI) to measure the effect of the implementation of the Stroke Model of Care (Health Service Executive, 2012). The NSR was governed by the NSR Steering Group. In 2019, governance of the NSR was transferred to NOCA and it was renamed the Irish National Audit of Stroke (Figure 1).

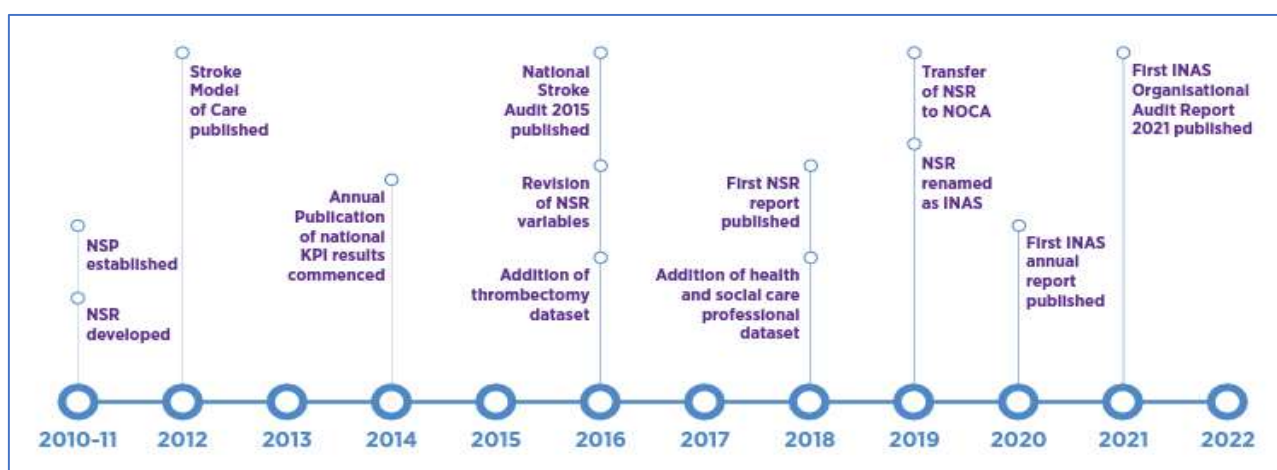


FIGURE 1: EVOLUTION OF THE IRISH NATIONAL AUDIT OF STROKE

THE IRISH NATIONAL AUDIT OF STROKE GOVERNANCE

The Irish National Audit of Stroke (INAS) is a clinically led, web-based audit that measures the care provided in hospital to patients with a stroke against the National Clinical Guideline for Stroke for the UK and Ireland (Intercollegiate Stroke Working Party, 2023). The INAS Governance Committee ([link to INAS Governance committee](#)) oversees the INAS. Its membership comprises clinical experts, public and patient interest representatives, the Healthcare Pricing Office (HPO), senior accountable healthcare management, and research and specialist bodies. The INAS Governance Committee also ensures that all relevant stakeholders are represented in order to verify that outputs of the audit findings are interpreted appropriately. The Clinical Lead, supported by the NOCA Executive Team, has operational responsibility for implementation of the INAS.

AIM AND OBJECTIVES OF THE IRISH NATIONAL AUDIT OF STROKE

| | |
|--|--|
| Aim: To conduct audit of stroke care, including clinical care and service organisation | |
| Objectives | To maintain a database of all inpatients with a stroke in Ireland in order to drive continuous quality improvement and to deliver the best patient outcomes. |
| | To support the collection of high-quality data on all inpatient strokes in Ireland in order to permit local and national reporting of outcomes. |
| | To disseminate the outputs of the data in a timely manner to all relevant stakeholders. |
| | To benchmark stroke care and outcomes against national and international standards. |
| | To support/promote the use of stroke data for quality improvement initiatives at local and national level. |
| | To provide data to support and inform national policy for stroke and related conditions. |

METHODS

All patients with ischaemic and haemorrhagic stroke who were treated in public hospitals that provide acute stroke care and that admitted more than 25 patients with a stroke are included in this audit.



DATA SOURCE

Data were sourced via the Hospital In-Patient Enquiry (HIPE) system. HIPE is the principal source of national data on discharges from acute hospitals in Ireland. It collects demographic, clinical and administrative data on discharges from, and deaths in, acute public hospitals nationally. Additional stroke-specific data ([link to INAS dataset](#)) were collected on patients with a stroke and were submitted from each hospital to the HIPE system via the stroke audit portal. The HIPE data and the INAS data were merged within HIPE to form a final dataset. The INAS dataset comprises clinical data collected on all patients with a stroke; these are known as core clinical data. These data have been collected since 2013 and have evolved, with amendments in 2016, 2020 and 2021. In 2016, additional thrombectomy data collected on patients who receive a thrombectomy in an EVT stroke centre were added to the INAS dataset. In 2018, additional discipline-specific data on health and social care professionals (HSCPs) were also added. The HSCP dataset was developed by the NSP in collaboration with the professional bodies for physiotherapy, occupational therapy, and speech and language therapy. The dataset was piloted in 2017 and the first publication of the data was in 2018 (NSP, 2019). The dataset remains in the implementation phase.



DATA COLLECTION

DATA COLLECTION: CORE CLINICAL DATASET

Each hospital has an audit coordinator and a clinical lead who lead on stroke service governance within the hospital. The audit coordinator, usually an experienced nurse specialising in stroke care, collects the core clinical data and submits them to the stroke audit portal. A list of cases eligible for inclusion can be identified by running a HIPE Discharge Report within the stroke audit portal. Additional cases may be identified manually. Most data are entered retrospectively.

DATA COLLECTION: THROMBECTOMY DATASET

The thrombectomy data are collected on all patients who receive a thrombectomy in an EVT stroke centre. Core clinical data and additional thrombectomy data are entered by the audit coordinators for each patient with a stroke who receives a thrombectomy in either of the two EVT stroke centres (Beaumont Hospital or Cork University Hospital).

DATA COLLECTION: HEALTH AND SOCIAL CARE PROFESSIONAL DATASET

Data are collected by therapists in each hospital and are presented in aggregate form. The HSCP dataset includes data from one hospital that is not eligible to participate in the core clinical dataset, as it provides rehabilitation services (not acute stroke care) to patients with a stroke.



DATA VALIDATION

In 2019, the NOCA Data Analytics and Research team developed a data validation process for the INAS, as follows:

1. The HPO issues monthly coverage reports and data extracts to NOCA.
2. The data analyst produces a Data Validation Report (DVR) quarterly of any missing information within the data and any data anomalies.
3. The DVR is sent to the audit coordinators, who amend the record.

In 2022, DVRs were sent to hospitals quarterly in order to reduce missing data and data anomalies, thus improving data quality.



DATA ANALYSIS

HIPE data and INAS data were merged within the HPO to form an anonymised stroke extract. NOCA received the full stroke extract for 2022 from the HPO in April 2023. The analysis was completed by the NOCA Data Analyst following data checks with the HPO. Data from the HIPE/INAS dataset were extracted by the NOCA analyst to form three separate datasets: the core clinical dataset, the thrombectomy dataset and the HSCP dataset. The inclusion and exclusion criteria for all three datasets are presented below. The analysis was conducted using Statistical Package for the Social Sciences (SPSS) V25.



COVERAGE AND COMPLETENESS ANALYSIS

Coverage was defined as the proportion of cases with a principal diagnosis of stroke that had additional clinical data submitted to the stroke audit portal. A final coverage report is collated by the HPO. Any hospital with less than 80% coverage is excluded in the report.

Completeness of variables is measured by the data analyst. All results including missing data and unknowns are included in the report



INCLUSION AND EXCLUSION CRITERIA

Core clinical dataset inclusion criteria are:

- I. patients discharged between 1 January 2022 and 31 December 2022
- II. cases reported on HIPE, using the International Classification of Diseases, Tenth Revision, Australian Modification (ICD-10-AM) codes I61, I63 or I64 as a principal diagnosis¹ (Independent Hospital Pricing Authority, 2017)
- III. patients aged 17 years and over
- IV. all cases with the 'in-hospital stroke' field populated with '2=No' within the stroke audit portal.
- V. all cases with the 'admission to stroke unit' field populated with either '1=Yes' or '2=No' within the stroke audit portal.

¹ The principal diagnosis on HIPE is defined as "the diagnosis established after study to be chiefly responsible for occasioning an episode of admitted patient care, an episode of residential care or an attendance at the health care establishment, as represented by a code" (Australian Consortium for Classification Development, 2017, p.1).



Core clinical dataset exclusion criteria are:

- I. patients aged 16 years and under
- II. patients with a HADx stroke code of I61, I63 or I64
- III. patients where the stroke occurred while in hospital with another condition
- IV. patients who had a thrombectomy in Beaumont Hospital or Cork University Hospital and were transferred back to the referring hospital on the same day.

The thrombectomy dataset inclusion criteria are:

- I. all cases with the 'thrombectomy' field populated with '1=Yes' within the stroke audit portal
- II. patients aged 17 years and over.

The thrombectomy dataset exclusion criterion is:

- I. patients aged 16 years and under.

HSCP dataset inclusion criteria are:

- I. all cases with '1=Yes' populated for the 'seen by physiotherapist', 'seen by occupational therapist', and/or 'seen by speech and language therapist' fields within the stroke audit portal
- II. patients aged 17 years and over.

HSCP dataset exclusion criterion is:

- I. patients aged 16 years and under.

NOTES ON INCLUSION AND EXCLUSION CRITERIA

Inclusion criterion IV and exclusion criteria III and IV refer to patients who had a stroke while already an inpatient with another condition (e.g. a stroke event following surgery); this is called 'in-hospital' stroke. The INAS dataset includes the collection of data on patients with in-hospital stroke, but these cases are not included in this report. These cases can be identified if the 'in-hospital stroke' field is populated as 'yes', but only those cases for which this field was populated with 'no' are included in this report. These in-hospital stroke cases can also be identified if a hospital acquired diagnosis (HADx) flag for stroke has been attached to the 'secondary diagnosis' field. These cases are also excluded from the core clinical dataset for this report.

Exclusion criterion IV refers to patients with a stroke who are transferred to an EVT stroke centre for thrombectomy and are then immediately transferred back to the referring hospital. These cases are excluded from the final denominator in the EVT stroke centre within the core clinical dataset, as this would negatively affect the results of the key quality indicators (KQIs) in the EVT stroke centre. For example, these cases would not be included in the analysis of the percentage of cases admitted to a stroke unit because they would not be expected to be admitted to the EVT stroke centre's stroke unit, as they were transferred back to the referring hospital immediately following thrombectomy.

Inclusion criterion V refers to cases where HSCP data were submitted with no associated core clinical data. This may occur if the audit coordinator did not submit data on a case or there was no audit coordinator due to a resourcing issue. In order to exclude these missing data from the core clinical dataset, any case that had no response in the 'admission to stroke unit' field was excluded.

APPENDIX 2: IRISH NATIONAL AUDIT OF STROKE: DATASET 2022

| | | |
|-------------|--|---|
| Key: | | |
| Dataset | HIPE VARIABLES | National in-patient administrative dataset. |
| Dataset | INAS VARIABLES | Data submitted by clinical team on all cases with a stroke |
| Dataset | INAS THROMBECTOMY VARIABLES | Data submitted by clinical team in the National Thrombectomy centres on cases who had a thrombectomy |
| Dataset | INAS ATRIAL FIBRILLATION SPOTLIGHT AUDIT VARIABLES | Data submitted by clinical team on all cases with atrial fibrillation - data only collected in 2022. |
| Dataset | HSCP- PHYSIOTHERAPIST VARIABLES | Data submitted by physiotherapists on cases with stroke - implementation phase, not active in all hospitals |
| Dataset | HSCP- OCCUPATIONAL THERAPIST VARIABLES | Data submitted by occupational therapists on cases with stroke - implementation phase, not active in all hospitals |
| Dataset | HSCP- SPEECH AND LANGUAGE THERAPIST VARIABLES | Data submitted by speech and language therapists on cases with stroke - implementation phase, not active in all hospitals |

| Data set | Definition | Instructions for answering field | Codes and values |
|---------------|-----------------------------------|----------------------------------|---|
| HIPE VARIABLE | NAME OF HOSPITAL | | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| HIPE VARIABLE | PATIENT HOSPITAL NUMBER ENCRYPTED | EG. A1234567 | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| HIPE VARIABLE | HIPE ADMISSION DATE | DD/MM/YYYY | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| HIPE VARIABLE | HIPE DISCHARGE DATE | DD/MM/YYYY | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| HIPE VARIABLE | HIPE VARIABLE | | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| HIPE VARIABLE | HIPE VARIABLE | | http://www.hpo.ie/HIPE_Data_Dictionary.htm |

| | | | |
|---------------|--|------------------------------|---|
| HIPE VARIABLE | HIPE DISCHARGE DESTINATION | | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| HIPE VARIABLE | GENDER | MANDATORY FIELD CODES 1-2 | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| HIPE VARIABLE | MARTIAL STATUS | | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| HIPE VARIABLE | HIPE VARIABLE IDENTIFYING AREA OF RESIDENCE | | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| HIPE VARIABLE | HIPE VARIABLE INDICATING MEDICAL SPECIALITY | | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| HIPE VARIABLE | HIPE VARIABLE DESCRIBING DISCHARGE STATUS | | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| HIPE VARIABLE | HIPE VARIABLE ADMISSION WARD | | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| HIPE VARIABLE | HIPE VARIABLE DISCHARGE WARD | | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| HIPE VARIABLE | HIPE VARIABLE SOURCE OF ADMISSION | | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| HIPE VARIABLE | HIPE VARIABLE PRIVATE DAYS | | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| HIPE VARIABLE | HIPE VARIABLE PUBLIC DAYS | | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| HIPE VARIABLE | HIPE VARIABLE SEMI-PRIVATE DAYS | | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| HIPE VARIABLE | HIPE VARIABLE ITU LENGTH OF STAY | | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| HIPE VARIABLE | HIPE VARIABLE WAITING LIST INDICATOR | | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| HIPE VARIABLE | HIPE VARIABLE MODE OF EMERGENCY ADMISSION | | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| HIPE VARIABLE | HIPE VARIABLE ADMISSION WEIGHT | | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| HIPE VARIABLE | HIPE VARIABLE WAS IN A DAY WARD | | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| HIPE VARIABLE | HIPE VARIABLE DAY WARD INDICATOR | | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| HIPE VARIABLE | HIPE VARIABLE TRANSFER HOSPITAL FROM | | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| HIPE VARIABLE | HIPE VARIABLE TRANSFER HOSPITAL TO | | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| HIPE VARIABLE | HIPE VARIABLE LENGTH OF STAY | | http://www.hpo.ie/HIPE_Data_Dictionary.htm |

| | | | |
|---------------|--|--|---|
| HIPE VARIABLE | HIPE VARIABLE AGE | | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| HIPE VARIABLE | HIPE VARIABLE DIAGNOSIS RELATED GROUP | | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| HIPE VARIABLE | HIPE VARIABLE MAJOR DIAGNOSTIC CATEGORY | | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| HIPE VARIABLE | HIPE VARIABLE HAS MEDICAL CARD | | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| HIPE VARIABLE | HIPE VARIABLE NAME OF HEALTH INSURER | | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| HIPE VARIABLE | HIPE VARIABLE DIAGNOSIS 1 | | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| HIPE VARIABLE | HIPE VARIABLE Diagnosis 2-30 | | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| HIPE VARIABLE | HIPE VARIABLE PROCEDURE 1-20 | | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| HIPE VARIABLE | HIPE Variable Procedure date | DD/MM/YYYY | http://www.hpo.ie/HIPE_Data_Dictionary.htm |
| INAS VARIABLE | Which hospital was patient transferred from (if any) | 0000 is auto populated to indicate that the patient was not transferred from another hospital. | 0000 Not Applicable 0941 Children's Crumlin 0101 St Columcille's 0102 Naas General 0908 Mater Hospital 0910 SVUH 0925 Peamount Hospital 0955 Cappagh Orthopaedic 0940 Temple Street 0947 St Luke's Rathgar 0904 SJH Dublin 0108 Connolly Blanchardstown 0912 Michaels Dun Laoghaire 0950 RVEEH 0960 National Rehabilitation 0930 Coombe Hospital 0932 Rotunda Dublin 0931 National Maternity Hosp 1270 Tallaght Hospital 1762 Josephs Raheny 0954 Clontarf Orthopaedic 1001 Blackrock Hospice 0600 Waterford 0601 St Luke's KK 0605 Wexford 0602 Kilcreene 0607 Clonmel 0705 Finbar's Cork 0704 Bantry 0913 Mercy Cork 0915 South Infirmary 0703 Mallow 0724 CUH 0726 Kerry 0301 Limerick Maternity 0300 Limerick 0302 Croom Limerick 0918 St Johns Limerick 0305 Ennis 0304 Nenagh 0803 Roscommon 0919 Portiuncula 0800 Galway 0802 Mayo 0801 Merlin Park 0203 Tullamore 0202 Mullingar 0201 Portlaoise 0500 Letterkenny 0501 Sligo 0922 Drogheda 0402 Cavan 0400 Louth County 0404 Monaghan 0403 Navan 8888 Other |
| INAS VARIABLE | Why was the patient transferred | | 1 Thrombolysis 2 Thrombectomy 3 Neuro Surgery 8 Other |
| INAS VARIABLE | If other transfer reason, please specify | | Free text |
| INAS VARIABLE | If other transfer hospital, please specify | | Free text |
| INAS VARIABLE | Symptom onset date | DD/MM/YYYY | |

| | | | |
|-------------------|---|-----------------------|---|
| INAS VARIABLE | Symptom onset time (enter 9999 if unknown) | Enter 9999 if unknown | |
| INAS VARIABLE | If symptom onset time is unknown, what date was the patient last known to be well | DD/MM/YYYY | |
| INAS VARIABLE | If symptom onset time is unknown, what time was the patient last known to be well | HH:MM | |
| INAS VARIABLE | Did the stroke occur while the patient was in hospital for treatment of another condition | | 1 Yes 2 No 9 Unknown |
| INAS VARIABLE | If no, date of presentation to hospital | DD/MM/YYYY | |
| INAS VARIABLE | If no, time of presentation to hospital | HH:MM | |
| INAS VARIABLE | If presentation time is unknown, was presentation to hospital within 4.5 hrs of symptom onset | | 1 Yes, 2 No 9 Unknown |
| INAS VARIABLE | Medical assessment date | DD/MM/YYYY | |
| INAS VARIABLE | Brain CT or MRI performed | | 1 Yes, 2 No 3 Performed pre adm / hosp transfer 9 Unknown |
| INAS VARIABLE | If yes, First Brain Imaging date | DD/MM/YYYY | |
| INAS VARIABLE | If yes, First Brain Imaging time | HH:MM | |
| INAS VARIABLE | Did the patient receive I.V. Thrombolysis | | 1 Yes, 2 No 5 Contraindicated |
| INAS VARIABLE | If yes, enter date | DD/MM/YYYY | |
| INAS VARIABLE | If yes, enter time | HH:MM | |
| INAS VARIABLE | If yes, was intracerebral bleed seen on scan within 36 hrs | | 1 Yes, 2 No 9 Unknown |
| INAS VARIABLE | If intracerebral bleed, was neuro deterioration associated with it | | 1 Yes, 2 No 9 Unknown |
| INAS thrombectomy | Did the patient have thrombectomy in this hospital (Beaumont / CUH only) | | 1 Yes, 2 No |
| INAS thrombectomy | NIHSS pre-thrombectomy | Freetext | |

| | | | |
|-------------------|--|------------|---|
| INAS thrombectomy | Date of performance of non contrast CT | DD/MM/YYYY | |
| INAS thrombectomy | Time of performance of non contrast CT | HH:MM | |
| INAS thrombectomy | Date of performance of non contrast CTA | DD/MM/YYYY | |
| INAS thrombectomy | Time of performance of non contrast CTA | HH:MM | |
| INAS thrombectomy | Date of contact with the endovascular stroke centre | DD/MM/YYYY | |
| INAS thrombectomy | Time of contact with the endovascular stroke centre | HH:MM | |
| INAS thrombectomy | Date of decision to transfer patient | DD/MM/YYYY | |
| INAS thrombectomy | Time of decision to transfer patient | HH:MM | |
| INAS thrombectomy | Date of arrival at the endovascular stroke centre | DD/MM/YYYY | |
| INAS thrombectomy | Time of arrival at the endovascular stroke centre | HH:MM | |
| INAS thrombectomy | Did the patient have repeat non invasive imaging in the endovascular stroke centre | | 1 Yes, 2 No 9 Unknown |
| INAS thrombectomy | If yes, please specify | | 1 Non contrast CT 2 CTA 3 Perfusion CT 4 MRI |
| INAS thrombectomy | Site of most proximal occlusion | | 1 MCA 1 2 MCA 2 3 Basilar 4 ICA carotid T/L 5 ICA cervical segment 6 PCA 7 Vertebro basilar |
| INAS thrombectomy | Second occlusion site | Free text | |
| INAS thrombectomy | Associated carotid stenosis greater than 50% | | 1 Yes, 2 No 9 Unknown |
| INAS thrombectomy | TICI pre thrombectomy | Free text | |
| INAS thrombectomy | TICI post thrombectomy | Free text | |
| INAS thrombectomy | Date of groin puncture | DD/MM/YYYY | |
| INAS thrombectomy | Time of groin puncture | HH:MM | |
| INAS thrombectomy | Date of first pass | DD/MM/YYYY | |
| INAS thrombectomy | Time of first pass | HH:MM | |
| INAS thrombectomy | Date of first reperfusion | DD/MM/YYYY | |

| | | | |
|-------------------|---|------------|--|
| INAS thrombectomy | Time of first reperfusion | HH:MM | |
| INAS thrombectomy | Date of final angio | DD/MM/YYYY | |
| INAS thrombectomy | Time of final angio | HH:MM | |
| INAS thrombectomy | Immediate complications | | 0 Not Applicable 1 Haemorrhage 2 Embolus into separate vascular territory 3 Dissection 8 Other 9 Unknown |
| INAS thrombectomy | NIHSS 24 hour post-thrombectomy | Free text | |
| INAS thrombectomy | Following procedure was patient transferred immediately back to primary receiving hospital | | 1 Yes, 2 No 9 Unknown |
| INAS thrombectomy | If no, when was patient admitted to the endovascular stroke centre | | 1 0-3 hrs 2 3-12 hrs 3 12-24 hrs 4 24+ hrs |
| INAS thrombectomy | Was the patient transferred from another hospital | | 1 Yes, 2 No 9 Unknown |
| INAS thrombectomy | If yes, what date did the patient arrive at the referring/first hospital | DD/MM/YYYY | |
| INAS thrombectomy | If yes, what time did the patient arrive at the referring/first hospital | HH:MM | |
| INAS thrombectomy | If yes, what date did the patient leave the referring/first hospital for transfer to the EVT centre | DD/MM/YYYY | |
| INAS thrombectomy | If yes, what time did the patient leave the referring/first hospital for transfer to the EVT centre | HH:MM | |
| INAS VARIABLE | Was a swallow screen completed | | 1 Yes, 2 No 9 Unknown |
| INAS VARIABLE | If yes, was swallow screen completed within 4 hours of presentation | | 1 Yes, 2 No 9 Unknown |
| INAS VARIABLE | Modified Rankin Scale pre stroke | | 0 Zero 1 One 2 Two 3 Three 4 Four 5 Five 6 Six 9 Unknown |
| INAS VARIABLE | Admitted to Stroke Unit (Key Performance Indicator) | | 1 Yes, 2 No |
| INAS VARIABLE | If yes, date admitted to Stroke Unit (Key Performance Indicator) | DD/MM/YYYY | |

| | | | |
|---------------|--|------------|--|
| INAS VARIABLE | If yes, date discharged from Stroke Unit (Key Performance Indicator) | DD/MM/YYYY | |
| INAS VARIABLE | If no, reason why | | 1 No Stroke Unit, 2 Bed Not Available, 5 Infection Control Risk, 8 Other |
| INAS VARIABLE | If other reason, please specify | | Free text |
| INAS VARIABLE | Allied Health Professional (AHP) Assessment | | 1 Yes, 2 No |
| INAS VARIABLE | If yes, Physiotherapy | | 1 Yes, 2 No 3 Not Indicated 9 Unknown |
| INAS VARIABLE | If yes, Occupational Therapy | | 1 Yes, 2 No 3 Not Indicated 9 Unknown |
| INAS VARIABLE | If yes, Speech and Language Therapy | | 1 Yes, 2 No 3 Not Indicated 9 Unknown |
| INAS VARIABLE | If yes, Dietetics | | 1 Yes, 2 No 3 Not Indicated 9 Unknown |
| INAS VARIABLE | If yes, Medical Social Worker | | 1 Yes, 2 No 3 Not Indicated 9 Unknown |
| INAS VARIABLE | If yes, Psychology | | 1 Yes, 2 No 3 Not Indicated 9 Unknown |
| INAS VARIABLE | Was the patient assessed by Stroke Nurse Specialist | | 1 Yes, 2 No, 9 Unknown |
| INAS VARIABLE | If no, reason why | | Free text |
| INAS VARIABLE | Multidisciplinary Meeting Case assessment | | 1 Yes, 2 No 3 Not Indicated 9 Unknown |
| INAS VARIABLE | Was an assessment of mood completed and documented by a member of the multidisciplinary team | | 1 Yes, 2 No 3 Not Indicated 9 Unknown |
| INAS VARIABLE | Does the patient have Symptomatic Carotid Stenosis | | 1 Yes, 2 No 9 Unknown |
| INAS VARIABLE | If Symptomatic Carotid Stenosis, was the patient referred for Carotid Endarterectomy | | 1 Yes, 2 No 9 Unknown |
| INAS VARIABLE | If Symptomatic Carotid Stenosis, was the patient referred for Carotid Stenting | | 1 Yes, 2 No 9 Unknown |
| INAS VARIABLE | New or Altered Antithrombotic Therapy prescribed for acute treatment | | 1 Yes, 2 No 3 Contraindicated 9 Unknown |

| | | | |
|--|--|------------|---|
| INAS VARIABLE | If yes, Antiplatelet Or Anticoagulant (for acute treatment) start date | DD/MM/YYYY | |
| INAS VARIABLE | Does the patient have Atrial Fibrillation | | 1 Yes, 2 No 4 Results Pending 9 Unknown |
| INAS VARIABLE | If Atrial Fibrillation, was atrial fibrillation known prior to stroke onset | | 1 Yes, 2 No 9 Unknown |
| INAS VARIABLE | If atrial fibrillation known prior to stroke onset, was Antiplatelet And/or Anticoagulant prescribed prior to Stroke onset | | 1 Yes, 2 No 9 Unknown |
| INAS VARIABLE | If yes, please specify Antiplatelet / Anticoagulant - prior to stroke | | 1 Warfarin 2 Dabigatran 3 Rivaroxaban 4 Apixaban 5 Aspirin 6 Clopidogrel 7 Other Antiplatelet 8 Dual Antiplatelet Therapy 9 Antiplatelet & Anticoagulant |
| INAS VARIABLE | If yes, please specify Antiplatelet / Anticoagulant - prior to stroke | | 0 NOAC 1 Warfarin 2 Dabigatran 3 Rivaroxaban 4 Apixaban 5 Aspirin 6 Clopidogrel 7 Other Antiplatelet 8 Dual Antiplatelet Therapy 9 Antiplatelet & Anticoagulant |
| INAS VARIABLE | If yes, please specify Antiplatelet / Anticoagulant - prior to stroke | | 0 NOAC 1 Warfarin 5 Aspirin 6 Clopidogrel 7 Other Antiplatelet 8 Dual Antiplatelet Therapy 9 Antiplatelet & Anticoagulant |
| INAS VARIABLE AF Spotlight audit until 31/1/22 | Which anticoagulant was prescribed just before the stroke | | 1 Warfarin, 2 Dabigatran, 3 Apixaban, 4 Edoxaban, 5 Rivaroxaban, 6 Antiplatelet only |
| INAS VARIABLE AF Spotlight audit until 31/1/22 | Was the correct DOAC dose prescribed, according to current guidance before the stroke | | 1 Yes, 2 No 9 Unknown |
| INAS VARIABLE AF Spotlight audit until 31/1/22 | If no, was the dose too high or too low | | 1 Too high, 2 Too low |
| INAS VARIABLE AF Spotlight audit until 31/1/22 | Was a DOAC level taken at time of presentation | | 1 Yes, 2 No 9 Unknown |
| INAS VARIABLE AF Spotlight audit until 31/1/22 | If yes, what date was the last DOAC taken | DD/MM/YYYY | |

| | | | |
|--|--|--------|---|
| INAS VARIABLE AF Spotlight audit until 31/1/22 | If yes, what time was the last DOAC taken | HH:MM | |
| INAS VARIABLE AF Spotlight audit until 31/1/22 | If yes, what was the level/result | Number | |
| INAS VARIABLE AF Spotlight audit until 31/1/22 | Had the anticoagulant been paused or stopped before the stroke | | 1 Yes, 2 No 9 Unknown |
| INAS VARIABLE AF Spotlight audit until 31/1/22 | If yes, why was it stopped | | 1 Pre-procedure, 2 Side effects, 3 Falls risk, 4 Poor patient compliance, 5 High bleed risk, 9 Unknown |
| INAS VARIABLE AF Spotlight audit until 31/1/22 | If yes, how long had the anticoagulant been stopped for | | 1. 1 day, 2. 2 days, 3. 3-7 days, 4->10 days |
| INAS VARIABLE AF Spotlight audit until 31/1/22 | If yes, who stopped it | | 1 Themselves, 2 A Healthcare Provider, 9 Unknown |
| INAS VARIABLE AF Spotlight audit until 31/1/22 | Did the patient / carer report often forgetting to take a tablet (more than once per week)? | | 1 Yes, 2 No 9 Unknown |
| INAS VARIABLE AF Spotlight audit until 31/1/22 | Who originally commenced the patient on an oral anticoagulant? | | 1 Primary Care, 2 Hospital, 3 Unknown |
| INAS VARIABLE AF Spotlight audit until 31/1/22 | Does the patient attend a hospital-based anticoagulation clinic or atrial fibrillation clinic | | 1 Yes, 2 No 9 Unknown |
| INAS VARIABLE | If atrial fibrillation known prior to stroke onset, and on Warfarin, was INR (International Normalised Ratio) 2-3 at Stroke onset. | | 0 Not applicable 1 Yes, 2 No 9 Unknown |
| INAS VARIABLE | If Atrial Fibrillation, Anticoagulation prescribed for secondary prevention | | 1 Yes, 2 No 9 Unknown |
| INAS VARIABLE | If yes, please specify Antiplatelet / Anticoagulant - on discharge | | 0 NOAC 1 Warfarin 5 Aspirin 6 Clopidogrel 7 Other Antiplatelet 8 Dual Antiplatelet Therapy 9 Antiplatelet & Anticoagulant |

| | | | |
|---------------|---|------------|---|
| INAS VARIABLE | If no, please enter reason documented | | 01 No reason documented 02 Major bleeding (prior history) 03 Severe illness (e.g. cancer, dementia) 04 Poor compliance (known or suspected) 05 Patient refused anticoagulation 06 Alcohol excess 07 Falls 08 Extreme frailty 09 Liver disease 10 Will commence anticoagulation as an out-patient. |
| INAS VARIABLE | Modified Rankin Scale on discharge | | 0 Zero 1 One 2 Two 3 Three 4 Four 5 Five 6 Six 9 Unknown |
| INAS VARIABLE | Discharge destination | | 1 Home 2 Patient died 3 Discharge to long term care 4 Discharge to off-site rehab 5 Transfer to referring hosp 6 Transfer to other hosp for on-going stroke care 7 Home with ESD 8 Other 9 Unknown |
| INAS VARIABLE | Case complete | | 1 Yes, 2 No, 9 Unknown |
| HSCP INAS | Was the patient referred to Physiotherapy? | | 1 Yes; 2 No; 3 Unknown |
| HSCP INAS | If yes, please provide date of referral | DD/MM/YYYY | |
| HSCP INAS | Was the patient seen by physiotherapy? | | 1 Yes 2 No 3 Discharged before seen 9 Unknown |
| HSCP INAS | If yes, date of initial contact by physiotherapy | DD/MM/YYYY | |
| HSCP INAS | Indoor mobility pre-admission | | 1 Indep no aid 2 Indep with an aid 3 S/V or assist of 1 person +/- aid 4 T/F only with assist +/- aid 5 Hoist transfer 9 Unknown |
| HSCP INAS | Were standardised outcome measures used? | | 1 Yes; 2 No; 9 Unknown |
| HSCP INAS | Was the intensity of Physiotherapy sufficient? | | 1 Yes 80-100% 2 Moderate 50-79% 3 No 0-49% 9 Unknown |
| HSCP INAS | Was intensity calculated on minutes of therapy? | | 1 Yes; 2 No; 9 Unknown |
| HSCP INAS | Did the patient require more than one therapist/PTA for more than half of their treatment sessions? | | 1 Yes; 2 No; 9 Unknown |

| | | | |
|-----------|---|------------|--|
| HSCP INAS | Indoor mobility on discharge | | 0 N/A RIP 1 Indep no aid 2 Indep with an aid 3 S/V or assist of 1 person +/- aid 4 T/F only with assist +/- aid 5 Hoist transfer 9 unknown |
| HSCP INAS | Onward physiotherapy referral to | | 0 N/A RIP 1 In-patient rehab 2 Community Physio 3 ESD PT 4 Stroke specific OPD physio 5 Day hospital 8 Other 9 Unknown |
| HSCP INAS | Was the patient referred to Occupational Therapy? | | 1 Yes; 2 No; 3 Unknown |
| HSCP INAS | If yes, please provide date of referral | DD/MM/YYYY | |
| HSCP INAS | Was the patient seen by Occupational Therapy | | 1 Yes 2 No 3 Discharged before seen 9 Unknown |
| HSCP INAS | If yes, date of initial assessment by OT | DD/MM/YYYY | |
| HSCP INAS | Prior to admission, which would <u>best describe</u> the patient's ability to attend to their personal activities of daily living | | 1 Independent; 2 Indep with cues/aids; 3 Required S/V or set-up; 4 Required assist; 5 Dependent / full care; 9 Unknown |
| HSCP INAS | Was the patient a driver prior to admission? | | 1 Yes; 2 No; 9 Unknown |
| HSCP INAS | If yes, was the patient advised prior to discharge about driving limitations post stroke | | 1 Yes; 2 No; 9 Unknown |
| HSCP INAS | Did the patient work in paid employment prior to admission? | | 1 Yes; 2 No; 9 Unknown |
| HSCP INAS | If yes, was the person advised about return to work prior to discharge? | | 1 Yes; 2 No; 3 Onward referral made; 9 Unknown |
| HSCP INAS | Was the intensity of OT input sufficient? | | 1 Yes 80-100% 2 Moderate 50-79% 3 No 0-49% 9 Unknown |
| HSCP INAS | Was intensity calculated on minutes of therapy? | | 1 Yes; 2 No; 9 Unknown |
| HSCP INAS | Did the patient require more than one therapist/PTA for more than half of their treatment sessions? | | 1 Yes; 2 No; 9 Unknown |

| | | | |
|-----------|--|------------|---|
| HSCP INAS | Were visual fields assessed during the admission? | | 1 Yes, using confrontation testing; 2 Yes, using perimetry testing; 3 Yes, using both confrontation and perimetry testing; 4 Attempted, but unable due to patient factors; 5 No; 9 Unknown |
| HSCP INAS | Was screening for cognitive impairment completed, using a valid screening measure? | | 1 Yes; 2 No; 3 Unable to complete due to patient factors; 9 Unknown |
| HSCP INAS | On discharge, which would best describe the patient's ability to attend to their personal activities of daily living | | 0 N/A RIP 1 Independent 2 Indep with cues/aids 3 Required S/V or set-up 4 Required assist 5 Dependent / full care 9 Unknown |
| HSCP INAS | Was an onward referral made for further Occupational therapy intervention | | 0 N/A RIP 1 Yes 2 No 9 Unknown |
| HSCP INAS | If yes, to what service? | | 1 Inpatient rehab (off-site); 2 Comm OT; 3 ESD OT; 4 Other |
| HSCP INAS | Was the patient referred to Speech & Language Therapy? | | 1 Yes; 2 No; 9 Unknown |
| HSCP INAS | If yes, please provide date of referral | DD/MM/YYYY | |
| HSCP INAS | Was the patient seen by Speech and Language Therapy? | | 1 Yes 2 No 3 Discharged before seen 9 Unknown |
| HSCP INAS | If yes, date of initial contact by SLT | DD/MM/YYYY | |
| HSCP INAS | Functional communication ability prior to admission. | | 1 No difficulties 2 Mild: Effective communication > 80% - Occasional breakdown in conversation 3 Moderate: Effective communication 50-79% - Frequent breakdown in conversation 4 Severe: Less than half (10-49%) of communication attempts are successful 5 Profound: No, or occasional (<10%) of communication attempts are successful 9 Unknown |
| HSCP INAS | Modified diet recommended prior to admission | | 1 Yes; 2 No; 9 Unknown |

| | | | |
|-----------|---|--|--|
| HSCP INAS | Modified fluids recommended prior to admission | | 1 Yes; 2 No; 9 Unknown |
| HSCP INAS | SLT Initial assessment diagnosis | | 1 Difficulties identified 2 No issues identified |
| HSCP INAS | Does the patient have swallowing difficulty | | 1 Yes; 2 No; 9 Unknown |
| HSCP INAS | Does the patient have dysarthria | | 1 Yes; 2 No; 9 Unknown |
| HSCP INAS | Does the patient have dyspraxia | | 1 Yes; 2 No; 9 Unknown |
| HSCP INAS | Does the patient have aphasia | | 1 Yes; 2 No; 9 Unknown |
| HSCP INAS | Does the patient have cognitive linguistic communication disorder | | 1 Yes; 2 No; 9 Unknown |
| HSCP INAS | Does the patient have voice difficulties | | 1 Yes; 2 No; 9 Unknown |
| HSCP INAS | Other difficulties, please specify | | Free text |
| HSCP INAS | Was the patient NPO pending swallow assessment? | | 1 Yes; 2 No; 9 Unknown |
| HSCP INAS | Was videofluoroscopy completed during episode? | | 1 Yes 2 No 3 Indicated but not available 9 Unknown |
| HSCP INAS | Was FEES completed during episode? | | 1 Yes 2 No 3 Indicated but not available 9 Unknown |
| HSCP INAS | Was the intensity of SLT sufficient? | | 1 Yes 80-100% 2 Moderate 50-79% 3 No 0-49% 9 Unknown |
| HSCP INAS | Was intensity calculated on minutes of contact | | 1 Yes; 2 No; 9 Unknown |
| HSCP INAS | New enteral feeding required on discharge | | 0 N/A RIP 1 Yes 2 No 9 Unknown |
| HSCP INAS | Newly modified diet recommended at discharge | | 0 N/A RIP 1 Yes 2 No 9 Unknown |
| HSCP INAS | Newly modified fluids recommended at discharge | | 0 N/A RIP 1 Yes 2 No 9 Unknown |
| HSCP INAS | Functional communication ability at discharge | | 0 N/A RIP 1 No difficulties 2 Mild: Effective communication > 80% - Occasional breakdown in conversation 3 Moderate: Effective communication 50-79% - Frequent breakdown in conversation 4 Severe: Less than half (10-49%) of communication attempts are |

| | | | |
|-----------|--------------------------|--|--|
| | | | successful 5 Profound: No, or occasional (<10%) of communication attempts are successful 9 Unknown |
| HSCP INAS | Further SLT requirements | | 0 None indicated 1 Communication 2 Swallow 3 Communication and swallow |
| HSCP INAS | Onward SLT referral to | | 0 N/A RIP 1 Inpatient rehab 2 Comm SLT 3 ESD SLT 7 None 8 Other |

APPENDIX 3: IRISH NATIONAL AUDIT OF STROKE GOVERNANCE COMMITTEE

| Representative | Name | 11.03.22 | 27.05.22 | 26.08.22 | 18.11.22 |
|--|----------------------|----------|----------|----------|----------|
| Healthcare Professional Expert: CNS Stroke | Glen Arrigan | x | x | ✓ | x |
| Senior Accountable Healthcare Manager | Sinead Brennan | ✓ | P | ✓ | x |
| Clinical Expert: Irish Gerontology Society | Dr Tim Cassidy | Chair | Chair | Chair | Chair |
| National Clinical Programme for Stroke: Programme Manager | Sinead Coleman | n/a | ✓ | x | ✓ |
| National Clinical Programme for Stroke: Clinical lead | Prof Ronan Collins | ✓ | ✓ | x | ✓ |
| Healthcare Professional Expert: Hospital Group Director of Nursing | Paul Gallagher | ✓ | ✓ | x | x |
| Clinical Lead: Irish National Audit of Stroke | Prof Joe Harbison | ✓ | ✓ | ✓ | ✓ |
| Cardiovascular Programme Audit Manager | Joan McCormack | ✓ | ✓ | ✓ | ✓ |
| Healthcare Professional Expert: ANP Stroke | Una Moffat | ✓ | ✓ | ✓ | ✓ |
| Healthcare Pricing Office | Marie Glynn | n/a | n/a | ✓ | ✓ |
| Clinical Expert: Clinical Advisory Group for Stroke | Dr Margaret O'Connor | ✓ | ✓ | ✓ | ✓ |
| National Health and Social Care Professions Office | Claire Prendergast | ✓ | ✓ | ✓ | ✓ |
| Public and Patient Interest Representative: Irish Heart Foundation | Martin Quinn | ✓ | ✓ | ✓ | ✓ |
| Clinical Expert: Rehabilitation Specialist | Dr Eugene Wallace | x | x | x | x |
| Patient/Public Interest Representative: Headway Ireland | Karen Kinsella | ✓ | ✓ | x | ✓ |
| Clinical Expert: National Thrombectomy Service Director | Prof John Thornton | ✓ | x | x | ✓ |
| Healthcare Pricing Office | Deirdre Murphy | ✓ | ✓ | R | n/a |
| Public Health Specialist | Breda Smyth | x | x | R | n/a |
| Public and Patient Interest Representative: Headway Ireland | Dr Marcia Ward | ✓ | R | n/a | n/a |
| Attended = ✓ | | | | | |
| Did not attend = x | | | | | |
| Not Applicable = n/a | | | | | |
| Retired = R | | | | | |
| Proxy = P | | | | | |

APPENDIX 4: IRISH NATIONAL AUDIT OF STROKE: AIMS AND OBJECTIVES

| AIM | |
|--|--|
| To conduct audit of stroke care, including clinical care and service organisation. | |
| OBJECTIVES | |
| ▶ | To maintain a database of all inpatients with a stroke in Ireland in order to drive continuous quality improvement and to deliver the best patient outcomes. |
| ▶ | To support the collection of high-quality data on all inpatient strokes in Ireland in order to permit local and national reporting of outcomes. |
| ▶ | To disseminate the outputs of the data in a timely manner to all relevant stakeholders. |
| ▶ | To benchmark stroke care and outcomes against national and international standards. |
| ▶ | To support/promote the use of stroke data for quality improvement initiatives at local and national level. |
| ▶ | To provide data to support and inform national policy for stroke and related conditions. |

APPENDIX 5: IRISH NATIONAL AUDIT OF STROKE: METADATA FOR COMPOSITE VARIABLES

FIGURE 4. 3: THE PROPORTION OF PATIENTS WITH A STROKE WHO RECEIVED BRAIN IMAGING WITHIN 1 HOUR OF HOSPITAL ARRIVAL, BY HOSPITAL

Out of all the patients, who had brain imaging performed, what was the proportion who received brain imaging within one hour of arrival to the hospital.

Analysis:

The difference in minutes between the date/time of hospital arrival and date/time of brain imaging – expressed as the percentage, per reported time frame (within 60 minutes/after 60 minutes/unknown).

Cases were included if:

- If patient had brain imaging performed

Cases were recorded as 'unknown':

- If the date/time of arrival to the hospital and/or brain imaging date/time was not recorded
- If the date/time of arrival to the hospital was recorded as after the brain imaging date/time. This indicates that wrong date was recorded
- If the interval between the hospital arrival date/time and the brain imaging date/time was one month or more. This indicates that wrong date/time was recorded.

FIGURE 4. 4: TIME INTERVALS BETWEEN HOSPITAL ARRIVAL TIME AND TIME OF THROMBOLYSIS, BY HOSPITAL

Out of all the patients who had thrombolysis performed what was the proportion of reported time frames between arrival to the hospital and thrombolysis.

Analysis:

The difference in minutes between the date/time of hospital arrival and date/time of thrombolysis – expressed as a percentage, per reported time frame.

Cases were included if:

- If patient was diagnosed with ischaemic stroke (I630, I631, I632, I633, I634, I635, I636, I637, I638, I639, I64)
- Patient had thrombolysis performed

Cases were excluded if:

- If patient was transferred to Beaumont Hospital or Cork University Hospital

Cases were recorded as 'not recorded correctly':

- If the date/time of arrival to the hospital and/or thrombolysis date/time was not recorded
- If the date/time of arrival to the hospital was recorded as after the thrombolysis date/time was performed
- If the interval between hospital arrival date/time and thrombolysis date/time was more than 24h apart.

FIGURE 4. 5: ADMISSION TO A STROKE UNIT, BY HOSPITAL

KQ1 1: Percentage of cases admitted to a stroke unit

Out of all the patients, what was the percentage that were admitted to stroke unit.

Analysis:

The total number of patients admitted to a stroke unit divided by the total number of patients – expressed as a percentage.

FIGURE 4. 6: SWALLOW SCREENING, BY HOSPITAL

KQ1 6: Percentage of cases who have a swallow screen completed

Out of all patients, what was the proportion who received a swallow screen.

Analysis:

The total number of patients who received a swallow screen divided by the total number of patients – expressed as a percentage.

FIGURE 4. 7: PROPORTION OF CASES ASSESSED BY A PHYSIOTHERAPIST, OCCUPATIONAL THERAPIST AND SPEECH AND LANGUAGE THERAPIST WITH ADDITIONAL HSCP DATA SUBMITTED, BY HOSPITAL

Physiotherapist

Out of all patients, who were assessed by a physiotherapist, what was the proportion who had additional physiotherapy specific HSCP data.

Analysis:

The total number of patients who were assessed by a physiotherapist divided by the total number of additional physiotherapy specific HSCP data – expressed as a percentage.

Occupational therapy

Out of all patients, who were assessed by an occupational therapist, what was the proportion who had additional occupational therapy specific HSCP data.

Analysis:

The total number of patients who were assessed by an occupational therapist divided by the total number of additional occupational therapy specific HSCP data – expressed as a percentage.

Speech and language therapy

Out of all patients, who were assessed by a speech and language therapist, what was the proportion who had additional speech and language therapy specific HSCP data.

Analysis:

The total number of patients who were assessed by a speech and language therapist divided by the total number of additional speech and language therapy specific HSCP data – expressed as a percentage.

FIGURE 4. 8: PERCENTAGE OF BED DAYS SPENT IN A STROKE UNIT FOR PATIENTS WHO SPENT ALL OR SOME OF THEIR HOSPITAL STAY IN A STROKE UNIT

KQ1 2: Percentage of time patients spent in a stroke unit

Out of the total number of bed days spend in a hospital, what was the percentage of bed days spent in a stroke unit.

Analysis:

The total stroke unit LOS (length of stay: bed days) divided by the total hospital LOS (bed days) – expressed as a percentage.

- For hospital LOS, the HIPE LOS variable was used

- For stroke unit LOS, the stroke unit admission date was subtracted from stroke unit discharge date to calculate the stroke unit LOS.

Cases are excluded if:

- Patient was not admitted to a stroke unit
- If date of admission and/or discharge to the stroke unit was not recorded
- If the year of admission and/or discharge to the stroke unit deviates from the reported year
- If stroke unit LOS is bigger than hospital LOS

FIGURE 5.3: DOAC PRESCRIPTION DATA FOR PATIENTS WITH ISCHAEMIC AND HAEMORRHAGIC STROKE

Out of all the patients, who had atrial fibrillation known before stroke and were prescribed a DOAC medication, what was the proportion who was prescribed correct dose, for each ischaemic and hemorrhagic stroke.

Analysis:

The total number of patients who had atrial fibrillation known before stroke and were prescribed a DOAC medication divided by the total number of patients who was prescribed correct dose – expressed as a percentage.

Cases were included if:

- If patient did not have an atrial fibrillation known before stroke
- If patient was not prescribed DOAC medication before stroke

FIGURE 5.4: ANTICOAGULATION ADHERENCE DATA FOR PATIENTS WITH ISCHAEMIC AND HAEMORRHAGIC STROKE

Forgetting to take medication

Out of all the patients, who had atrial fibrillation known before stroke and were prescribed an anticoagulant medication, what was the proportion who reported to often forget to take a tablet (more than once per week).

Analysis:

The total number of patients who had atrial fibrillation known before stroke and were prescribed an anticoagulant medication divided by the total number of patients who reported to often forget to take a tablet (more than once per week) – expressed as a percentage.

Cases were included if:

- If patient did not have an atrial fibrillation known before stroke
- If patient was not prescribed anticoagulant medication before stroke

Anticoagulant been paused or stopped, before stroke

Out of all the patients, who had atrial fibrillation known before stroke and were prescribed an anticoagulant medication, what was the proportion who reported to have paused or stopped the medication before the stroke.

Analysis:

The total number of patients who had atrial fibrillation known before stroke and were prescribed an anticoagulant medication divided by the total number of patients who reported to have paused or stopped the medication before the stroke – expressed as a percentage.

Cases were included if:

- If patient did not have an atrial fibrillation known before stroke
- If patient was not prescribed anticoagulant medication before stroke

Reason for pausing or stopping anticoagulant, before stroke

Out of all the patients, who had atrial fibrillation known before stroke and paused or stopped their anticoagulant medication, what was the reason for stopping or forgetting the anticoagulant medication.

Analysis:

The total number of patients who had atrial fibrillation known before stroke and paused or stopped their anticoagulant medication divided by the reported reason for stopping or forgetting the anticoagulant medication – expressed as a percentage per reason category¹.

Cases were included if:

- If patient did not have an atrial fibrillation known before stroke
- If patient was not prescribed anticoagulant medication before stroke
- If patient did not stop or forget to take their anticoagulant medication before stroke

How long was anticoagulant medication stopped for

Out of all the patients, who had atrial fibrillation known before stroke and paused or stopped their anticoagulant medication, what was the duration of the pause.

Analysis:

The total number of patients who had atrial fibrillation known before stroke and paused or stopped their anticoagulant medication divided by the reported duration – expressed as a percentage per duration category².

Cases were included if:

- If patient did not have an atrial fibrillation known before stroke
- If patient was not prescribed anticoagulant medication before stroke
- If patient did not stop or forget to take their anticoagulant medication before stroke

Who stopped anticoagulant medication

Out of all the patients, who had atrial fibrillation known before stroke and paused or stopped their anticoagulant medication, who stopped it.

Analysis:

The total number of patients who had atrial fibrillation known before stroke and paused or stopped their anticoagulant medication divided by the reported categories – expressed as a percentage per category³.

Cases were included if:

- If patient did not have an atrial fibrillation known before stroke
- If patient was not prescribed anticoagulant medication before stroke
- If patient did not stop or forget to take their anticoagulant medication before stroke

FIGURE 5.5: DISTRIBUTION OF PATIENTS IN THE FIVE ATRIAL FIBRILLATION GROUPS

For detailed specifications on how the atrial fibrillation groups were defined, see APPENDIX 7.

TABLE 5.2: ONSET TO HOSPITAL ARRIVAL AND HOSPITAL ARRIVAL TO BRAIN IMAGING TIMELINESS, AND THROMBOLYSIS, FOR EACH OF THE ATRIAL FIBRILLATION GROUPS

Time from stroke symptom onset to hospital arrival (minutes)

Within the defined 5 AF Groups⁴, what was the median time from stroke symptom onset to the arrival to the hospital.

Analysis:

The difference in minutes between the date/time of stroke symptom onset and arrival at the first hospital and date/time – expressed in median minutes per 5 AF Groups.

Cases were included if:

- If patient belonged to a defined 5 AF Group

Cases were excluded if:

- If patient did not belong to a defined 5 AF Group
- If the date/time of stroke symptom onset and/or arrival at the first hospital date/time was not recorded
- If the date/time of stroke symptom onset was recorded as after the arrival at the first hospital
- If the interval between stroke symptom onset and arrival at the first hospital was more than 12 months apart

Time between hospital arrival and brain imaging (minutes)

Within the defined 5 AF Groups⁵, what was the median time from the arrival to the hospital and brain imaging.

Analysis:

The difference in minutes between the date/time of the arrival to the first hospital and date/time of brain imaging – expressed in median minutes per 5 AF Groups.

Cases were included if:

- If patient belonged to a defined 5 AF Group
- If patient received CT or MRI scan

Cases were excluded if:

- If patient did not belong to a defined 5 AF Group
- If patient did not receive CT or MRI scan, or this information was unknown
- If the date/time of arrival at the first hospital and/or brain imaging date/time was not recorded
- If the date/time of the arrival at the first hospital was after brain imaging date/time
- If the interval between arrival at the first hospital and brain imaging was more than 30 days apart

Thrombolysis

Out of all the patients with ischaemic stroke, within the defined 5 AF Groups⁶, what was the proportion who received thrombolysis therapy.

Analysis:

The total number of patients with ischaemic stroke who received thrombolysis divided by the total number of patients with ischaemic stroke – expressed as a percentage.

Cases were included if:

- If patient had an ischaemic stroke (codes: I630, I631, I632, I633, I634, I635, I636, I637, I638, I639, I64)

Cases were excluded if:

- If patient was transferred to Beaumont Hospital or Cork University Hospital

TABLE 5:3: HOSPITAL AND STROKE UNIT LENGTH OF STAY, FOR EACH OF THE ATRIAL FIBRILLATION GROUPS
Stroke Unit LOS (days)

Within the defined 5 AF Groups⁷, what was the median number of days spent in a stroke unit

Analysis:

The difference in days between the date of admission to a stroke unit and date of discharge from a stroke unit – expressed in median number of days per 5 AF Groups.

Cases were included if:

- If patient belonged to a defined 5 AF Group

- If patient was admitted to a stroke unit

Cases were excluded if:

- If patient did not belong to a defined 5 AF Group
- If patient was not admitted to a stroke unit
- If the date of stroke unit admission and/or date of discharge from a stroke unit was not recorded
- If the date of stroke unit admission was after date of discharge from a stroke unit
- If the date of a stroke unit admission was before the date of admission to the hospital (HIPE)
- If the date of a stroke discharge was after the date of hospital discharge (HIPE)

Proportion of stay in a stroke unit

Within the defined 5 AF Groups⁸, out of the total number of bed days spend in a hospital, what was the percentage of bed days spent in a stroke unit.

Analysis:

The total stroke unit LOS (length of stay: bed days) divided by the total hospital LOS (bed days) – expressed as a percentage.

- For hospital LOS, the HIPE LOS variable was used
- For stroke unit LOS, the stroke unit admission date was subtracted from stroke unit discharge date to calculate the stroke unit LOS.

Cases are excluded if:

- Patient was not admitted to a stroke unit
- If date of admission and/or discharge to the stroke unit was not recorded
- If the year of admission and/or discharge to the stroke unit deviates from the reported year
- If stroke unit LOS is bigger than hospital LOS

Composite variables

KQ1 1: Percentage of cases admitted to a stroke unit

Out of all the patients, what was the percentage that were admitted to stroke unit.

Analysis:

The total number of patients admitted to a stroke unit divided by the total number of patients – expressed as a percentage.

KQ1 2: Percentage of time patients spent in a stroke unit

Out of the total number of bed days spend in a hospital, what was the percentage of bed days spent in a stroke unit.

Analysis:

The total stroke unit LOS (length of stay: bed days) divided by the total hospital LOS (bed days) – expressed as a percentage.

- For hospital LOS, the HIPE LOS variable was used
- For stroke unit LOS, the stroke unit admission date was subtracted from stroke unit discharge date to calculate the stroke unit LOS.

Cases are excluded if:

- Patient was not admitted to a stroke unit
- If date of admission and/or discharge to the stroke unit was not recorded

- If the year of admission and/or discharge to the stroke unit deviates from the reported year
- If stroke unit LOS is bigger than hospital LOS
-

KQI 3: The percentage of patients with ischaemic stroke who receive thrombolysis

Out of all the patients with ischaemic stroke what was the proportion who received thrombolysis therapy.

Analysis:

The total number of patients with ischaemic stroke who received thrombolysis divided by the total number of patients with ischaemic stroke – expressed as a percentage.

Cases were included if:

- If patient had an ischaemic stroke (codes: I630, I631, I632, I633, I634, I635, I636, I637, I638, I639, I64)

Cases were excluded if:

- If patient was transferred to Beaumont Hospital or Cork University Hospital

KQI 4: Median time between hospital arrival time and brain imaging time (minutes)

Out of all the patients, who had brain imaging performed, what was the median time between hospital arrival time and brain imaging time.

Analysis:

The difference in minutes between the date/time of hospital arrival and date/time of brain imaging – expressed as the median.

Cases were included if:

- If patient had brain imaging performed

KQI 5: Median time between hospital arrival time and time of thrombolysis (minutes)

Out of all patients who had thrombolysis performed, what was the median time to thrombolysis therapy.

Analysis:

The difference in minutes between the date/time of hospital arrival and date/time of thrombolysis – expressed as the median.

Cases were included if:

- If patient had an ischaemic stroke (codes: I630, I631, I632, I633, I634, I635, I636, I637, I638, I639, I64)
- Patient had thrombolysis performed

Cases were excluded if:

- If patient was transferred to Beaumont Hospital or Cork University Hospital
- If the date/time of arrival to the hospital and/or thrombolysis date/time was not recorded
- If the date/time of arrival to the hospital was recorded as after the thrombolysis date/time was performed
- If the interval between hospital arrival date/time and thrombolysis date/time was more than 24h apart.

KQI 6: Percentage of cases who have a swallow screen completed

- Out of all patients, what was the proportion who received a swallow screen.
- Analysis:
- The total number of patients who received a swallow screen divided by the total number of patients – expressed as a percentage.

○

KQ1 7: Percentage of cases who have a swallow screen completed within 4hr

Out of the patients who received a swallow screen, what was the proportion who received the swallow screen within four hours.

Analysis:

The total number of patients who received a swallow screen within four hours divided by the total number of patients who received a swallow screen – expressed as a percentage.

Cases are included if:

- If patients had a swallow screen performed

APPENDIX 6: IRISH NATIONAL AUDIT OF STROKE: ASSESSMENT OF DATA QUALITY

| | |
|-----------------------|---|
| Audit | Irish National Audit of Stroke |
| Purpose | Illustrate the data quality processes which the audit/ national data collection will apply in the year ahead. |
| Effective from | 01 /01/ 2022 - 31/12/2022 |
| Developed by | Joan McCormack |
| Date | 10/6/22 |
| Approved by | QA and Operations Manager / Designee |
| Date | |

Relevance

Relevant data meets the current and potential future needs of users.

| Characteristic | Criteria | Assessment |
|-------------------------|---|---|
| Release and use of data | Are regular assessments carried out to determine whether all of the data that is being collected is being used? | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| | Has a list of key users and their use of the data been compiled, including unmet user needs? | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> |
| | Is this reviewed annually? | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> |
| Value of data | Are data users consulted to establish if the data available assists them in achieving their objectives? | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |

| | | |
|--|--|---|
| | Are quality improvement plans in place to address required improvements in the data in order to ensure the data remains relevant to users? | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> |
| Adaptability of the data source | Are procedures in place to gather information on the potential future needs of data users? | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> |
| | Are data user needs prioritised as a result, of consultation undertaken with data users about how the data relates to their needs? | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| Additional comment Free text for additional supporting information | | |

Accuracy and Reliability

The accuracy of data refers to how closely the data correctly describes what it was designed to measure. Reliability refers to whether that data consistently measures, over time, the reality that it was designed to represent.

| Characteristic | Criteria | Assessment |
|----------------|---|--|
| Coverage | Are details of the reference population explicitly stated in all information releases and is the coverage of the population quantified? | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> |
| | Are significant coverage issues that may impact analysis and interpretation of data documented and made available to users? | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> |
| | Are processes in place to identify and handle duplicate and potential duplicate records within the data? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |

| | | |
|--|---|---|
| | | Partially <input type="checkbox"/> |
| Data capture and collection | Are issues with the quality of data submitted that have the potential to impact significantly on analysis and interpretation of that data addressed and documented for users of the data? | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> |
| Data processing | Are data validation processes applied consistently and are the processes documented for data users? | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> |
| Completeness and validity | Are rates of valid, invalid, missing and outlier values documented and updated routinely and reported with each data release? | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> |
| Revisions | Are revisions or corrections made to the data regularly analysed to ensure effective statistical use of same? | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| Additional comment Attaching the IHI to the HIPE records is a recommendation of the 2021 report. | | |

Timeliness and Punctuality

Timely data is collected within a reasonable agreed time-period after the activity that it measures. Punctuality refers to whether data are delivered or reported on the dates promised, advertised or announced.

| Characteristic | Criteria | Assessment |
|------------------------------|---|--|
| Submission timeliness | Are procedures in place to ensure the effective and timely submission of data from providers? | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| | Are agreements in place with data providers, which detail planned dates for submission of data? | Yes <input checked="" type="checkbox"/> |

| | | |
|--|--|---|
| | | No <input type="checkbox"/> |
| | Are follow-up procedures in place to ensure timely receipt of data, including procedures to address necessary improvements? | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| Processing timeliness | Are data processing activities regularly and systematically reviewed to improve timeliness and has an associated action plan been developed and implemented? | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| Release timeliness and punctuality | Has a data release policy and procedures document, which includes targets for timeliness, been developed, published and implemented? Does the policy describe revisions for key outputs that are subject to scheduled revisions? | Yes <input type="checkbox"/> No <input type="checkbox"/> Partially <input checked="" type="checkbox"/> |
| | Do planned releases occur within a specified period of time from the end of the reference period? | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| | In the event of delays affecting a planned release, are delays and causes documented and made available to data users? | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> |
| | Is an up-to-date release calendar publicly available? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Additional comment Free text for additional supporting information | | |

Coherence and Comparability

Coherent and comparable data is consistent over time and across providers and can be easily combined with other sources.

| Characteristic | Criteria | Assessment |
|--|--|---|
| Standardisation | Is data collected in line with national and international standards and classifications? | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> |
| | Is a data dictionary available? | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| | If yes, is it publicly available?" | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Coherence | Is aggregated data compared with other sources of data, for example, administrative data, that provide the same or similar information on the same phenomenon? | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| | Are divergences identified and clearly explained to data users? | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| Historical comparability | Are historical changes/trends in the data documented and publicly available for data users? | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> |
| | Are any changes in the data/trends that can potentially have a significant impact on interpretation and analysis of data, that is, changes to key elements of the data set, documented and available for data users? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A <input type="checkbox"/> |
| Regional comparability | Is the impact of any identified differences in data across regions documented? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A <input type="checkbox"/> |
| Additional comment Free text for additional supporting information | | |

Accessibility and Clarity

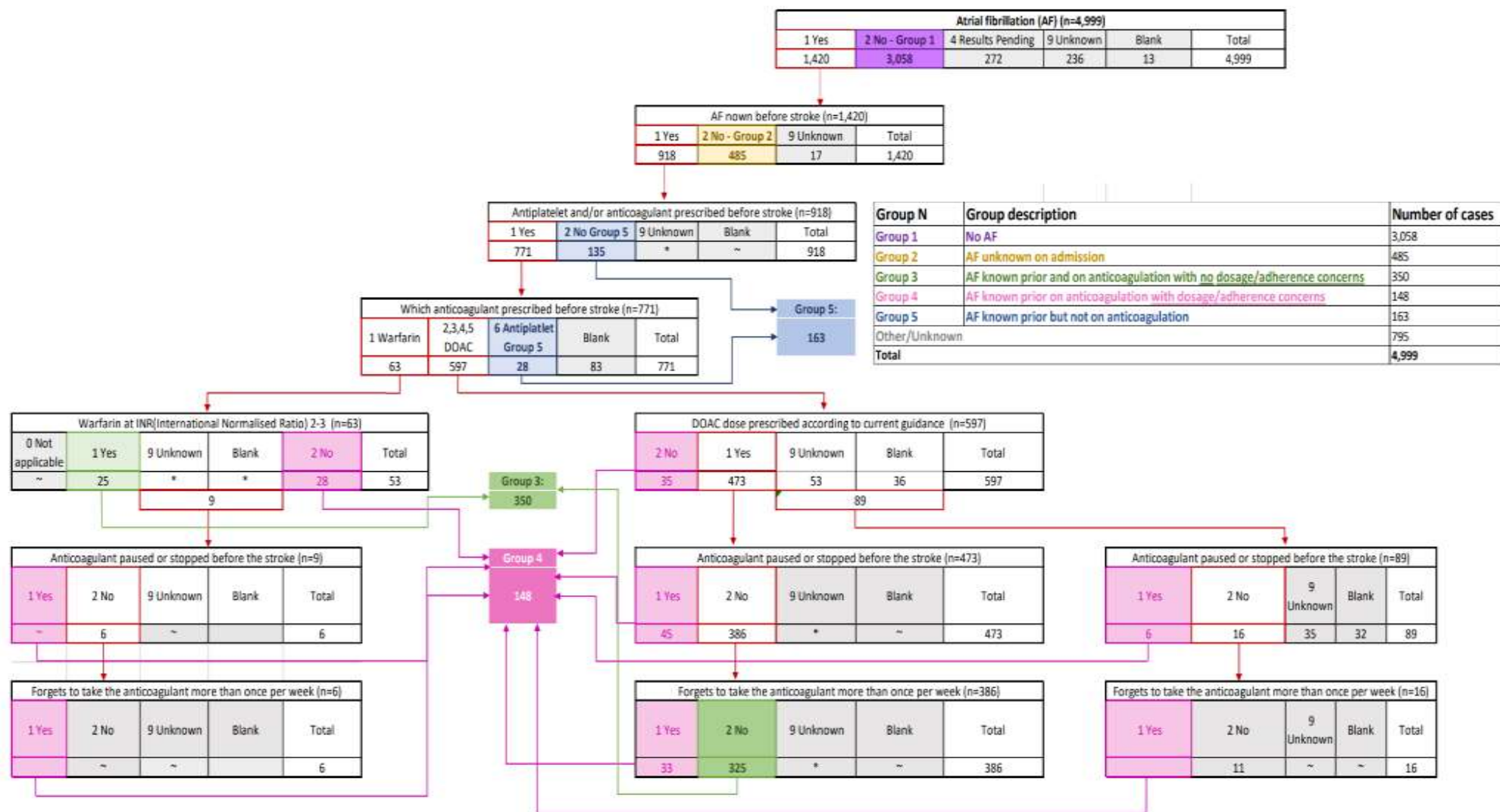
Data are easily obtainable and clearly presented in a way that can be understood.

| Characteristic | Criteria | Assessment |
|--|---|---|
| Accessibility | Are data available to users in a form that facilitates proper interpretation and meaningful comparisons? | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| | Is ICT effectively used to disseminate data and information? | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| Interpretability | Are supporting documents, for example, metadata, publicly available to facilitate clarity of interpretation for data users? | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> |
| | Does a revision policy exist which covers all data and is it available to data users | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Partially <input type="checkbox"/> |
| Additional comment Free text for additional supporting information | | |

Reference

Health Information and Quality Authority (2018) Data Quality Assessment Tool for health and social care. Available from: <https://www.hiqa.ie/reports-and-publications/health-information/guidance-data-quality-framework-health-and-social-care> [Accessed on: 31st August, 2021]

APPENDIX 7: IRISH NATIONAL AUDIT OF STROKE: AF GROUP SPECIFICATIONS



~ Denotes five cases or fewer

* Further suppression required in order to prevent disclosure of five cases or fewer

National Quality Improvement Stroke Service project 2022: Data collection for the Irish National Audit of Stroke (INAS) & National Office of Clinical Audit (NOCA) and QI Thrombectomy Audit.

An important role of the stroke CNS is data collection for Audit purposes.

The development of the stroke CNS assessment form aimed to capture audit data while remaining patient focused in delivering international/national standard stroke care, meeting International/national investigation criteria and achieving National Key Performance Indicators (KPI).

Patient focused
stroke history &
stroke diagnosis
Data collection for
INAS/NOCA and
QI Thrombectomy
Audit

FAST / Team Ref **Stroke CNS Assessment UHK**

Ref: IHF Y/N ___ B. Mhuire Y/N ___ Smoke Cess Y/N ___ ABI Y/N ___ NRH Y/N ___

Presentation:

Medical R/V:

Onset date: ___ Wake up Y/N ___ Inpatient: Y/N ___
Onset Time: ___ Found time: ___ ED Ward: ___
ADM date: ___ LSW date: ___ Inpatient Fast Call
Time: ___ Call time: ___
NIHSS: baseline mRS B. Sugar: GCS: BP:
CTB / CTA MRI CTB/A: ___
DATE: ___
CTB: ___
CTA: ___
Time: ___
Decision/ Report
time: ___

STROKE TYPE & INTERVENTIONS

Ischaemic stroke / TIA
Loading dose: YES / NO Date c/o: ___
ASA and c/o ASA DAPT and c/o DAPT
NOAC: Hold ___ Adm DOAC & dose ___
Continue: ___
STATIN: HTN
Investigations
Swallow screen: Y/N 4hrs of Adm Y/N
Telemetry form: Y/N
Stroke blood form: Y/N
IPC's Charted: Y/N
Pain relief charted: Y/N
Thrombolysis Yes / No / Contraindicated
Reason: ___
NIHSS: pre ___
Thrombolysis date: ___ Time: ___
24 hr CTB: Y/N Bled on scan: Y/N
Associated neuro deterioration: Y/N
Day 1 date & NIHSS: ___
Day 2 date & NIHSS: ___

Haemorrhagic stroke
D/C anticoagulation: Y/N
Tranexamic Acid: Y/N
Ref to neurosurgery: Y/N
Repeat CTB x 24hrs: Y/N
If extension of bleed with neuro deterioration: Y/N
HTN meds: ___
Admission to Stroke Unit: Yes / No
Admission date: ___
Discharge date: ___
Reason: ___
Ward: ___
Thrombectomy Pre Thrombectomy NIHSS: ___
EVT contacted date: ___ Time: ___
Decision time: ___ Delay: ___
EVT time: ___ Return UHK: ___
Day 1 date & NIHSS: ___
Day 5 date & NIHSS: ___
Date & mRS Day 30: ___ Day 90: ___

Patient centered information
collection & ensuring current
evidence based best practice
in stroke treatment is
achieved
Meeting KPI's and Data
collection for INAS/NOCA &
QI Thrombectomy Audit

Identifying the patients potential
stroke cause & risk factors
Data collection for INAS/NOCA
and
A.Fib spot check National Audit

Identifying baseline
ability & home
circumstances
information,
preparing for patient
centered discharge

Meeting KPI's by ensuring
patients have HSCP team
assessment & required therapy
Data collection for INAS/NOCA

Record of stroke education and
details for referral to stroke
community services &
QI Thrombectomy service follow up

Ensuring necessary
investigations to
meeting national
stroke criteria &
Data for
INAS/NOCA

Discharge info for
local Audit &
INAS/NOCA

Risk factors:

A.Fib on DOAC/ Warfarin / ASA / Nil New A.Fib
HTN Stroke/MI TIA IHD DM +ve FH
Hyper lipids Valvular disease
Other: ___
DOAC: ___ if known A.Fib not on DOAC Why: ___

a) Therapeutic dose: Yes / No. b) Too high / Too Low c) Was DOAC stopped Yes / No.
d) Stopped for Days: 1 / 2 / 3-4 / >10 e) Pattern of missing DOAC: Y/N > 1 Tablet/ Wkly.
f) Who c/o DOAC: ___ g) Attend anti co-ag/ HF/ A/Fib clinic Y/N
h) If Warfarin is INR 2-3 i) If A.F. and co-ag 2nd prevent: Yes / No
j) If no reason: ___ k) Specify which anti co-ag on discharge

LifeStyle Risk:
Smoker
Poor meds compliance
+BMI/ poor diet
Alcohol/Drug: ___

Mobility Independent
Stick
Frame
Assist x 1 or 2
Hoist

Living Alone
With spouse
Child
Carer child
Nursing Home

Cognition Normal
MCI
Dementia:
Mild
Moderate
Severe

Home help None
Day care
Weekly: /?
Daily:
No of visits
No of carers

Home Level
2 story
Adapted
Family support
M on W
Driver:

Did the patient see:
CNS PT SLT Dietician
MSW Psychologist

MDM Discussion: Yes / No
Mood Assessment: Yes / No C/O on SSRI Yes/No

Symptomatic Carotid Stenosis: Yes / No
Carotid Endarterectomy: Yes / No
EVT Stenting: Yes/ No

Investigations:
Telemetry: S. Rhythm
A. Fibrillation / A. Flutter
Known A.Fib
Echo: NAD LVH
Dilated LA Thrombus
C. Doppler: ___
CTA: ___

Stroke Bloods:
HbA1c: ___ F. Glucose: ___
Cholesterol: ___ LDL: ___

Young Stroke additional work up (<65yrs)
Young bloods date: ___ Toxicology Yes / No
Ref cardiology re: TOC Bubble

Discharge date: ___

Destination: Home Off site rehab LTC
ESD Referring Hospital RIP
Other: ___

Discharge mRS: ___ Return to baseline Yes / No
Needing new home care package:
Needing Nil:

Benefits:

Structuring data collection in real time allowing for more time with direct patient care.

Mary Donovan Stroke CNS, with thanks to the Stroke Service Governance
Committee

March 2023



Blood Pressure & Hypertension Management in Acute Stroke A Quality Improvement Initiative to enhance Stroke Management pathways

Background: It was identified that the acute stroke pathway was limited in its guide to BP & HTN management.

With the publication from the European Stroke Organisation (2021) in guidelines for Stroke care BP & HTN management

The stroke service decided to incorporate the evidence based best practice guidelines into the UHK Time is Brain document.

Bringing the Acute stroke management pathway in line with European Standards and with National centre of excellence.

Aims & Objectives:

To incorporate acute BP & HTN management in:

1. Interventional Ischaemic strokes
2. Non-interventional Ischaemic strokes
3. Haemorrhagic stroke
4. Hypotension management

Project Description: The Stroke Governance Team

- Reviewed the existing document and identified the gaps in the pathway.
- Set up a sub group of the stroke governance team, this Stroke QI sub group including input from stroke consultant, medical registrar, Stroke CNS & pharmacy support.
- Reviewed the evidence based ESO (2021) guidelines.
- After the review was complete, the governance group decided on the appropriate changes and
- Decided the guidelines would be best place in the Time is Brain document thereby allowing easy access to all clinical staff.
- The additions were made and the changes were agreed & approved by the UHK drug safety & medical governance council.

Outcome/Results:

UHK are now using more defined BP & HTN management for the varied stroke diagnosis - providing clear parameters and guidance in treatment pathways thus improving Person centered stroke care

Conclusion: The Time is Brain document with the incorporated Blood pressure & Hypertension management in acute stroke was launched hospital wide in Q4 2022.

"Establishing a PFO Pathway for Acute Stroke Patients with a Positive Bubble Study"

Lisa Donaghy (Stroke RANP CHB), Dr. Lavanya Saiva (Cardiologist CHB), Prof. Ivan Casserly (Cardiologist MMUH), Jamie Byrne (Structural CNS MMUH), Dr. Patricia Guilfoyle (Stroke Consultant CHB), Dr. Orla Sheehan (Stroke Consultant CHB), Dr. Eamon Dolan (Stroke Consultant CHB)

Connolly Hospital Blanchardstown 2023

Introduction and background

A bubble study is performed routinely on patients under the age of 65 years of age with a confirmed diagnosis of either acute ischaemic stroke or TIA in order to assist with the presence of a PFO/ASD as an aetiology for the stroke event. Connolly Hospital Blanchardstown has a higher number of stroke survivors <65 years (Nationally = 26%, CHB 36%) (INAS, 2021). Historically, a referral letter would be written to a hospital who specialises in cardiac structural surgeries, requesting a review of a patient with a positive bubble study and acute stroke. Patients were not triaged and closure would typically exceed 9 months.

Aim

To reduce the PFO closure time from 12 months to 3 months.

What is a PFO?

- ❖ Patent Foramen Ovale
- ❖ Tunnelled defect in the inter atrial septum.
- ❖ Normally closes during infancy.
- ❖ It does not close in approximately 25%.
- ❖ Most patients are asymptomatic.
- ❖ Problems can arise when a blood clot passes from venous to arterial system through the PFO.

(Kottoo & Arora, 2018)

Risk of Paradoxical Embolism (RoPE) score

| TABLE 1. RoPE SCORE CALCULATOR | |
|--------------------------------|--------|
| Patient Characteristic | Points |
| No history of hypertension | +1 |
| No history of diabetes | +1 |
| No history of stroke or TIA | +1 |
| Nonsmoker | +1 |
| Cortical infarct on imaging | +1 |
| Age (y) | |
| 18-29 | +5 |
| 30-39 | +4 |
| 40-49 | +3 |
| 50-59 | +2 |
| 60-69 | +1 |
| ≥ 70 | +0 |
| Total RoPE score | 0-10 |

RoPE score 0-3 = 0% chance that stroke is due to PFO.

RoPE score 4 = 38% chance that stroke is due to PFO.

RoPE score 5 = 34% chance that stroke is due to PFO.

RoPE score 6 = 62% chance that stroke is due to PFO.

RoPE score 7 = 72% chance that stroke is due to PFO.

RoPE score 8 = 84% chance that stroke is due to PFO.

RoPE score 9 & 10 = 88% chance that stroke is due to PFO.

Prior to pathway

- ✓ Positive bubble study
- ✓ TOE performed
- ✓ Letter of referral to Cardiology in MMUH on discharge. Patients not triaged. RoPE score not calculated.
- ✓ Reviewed in Cardiology Clinic in MMUH (6-9 months)
- ✓ Stroke recovery update and outstanding results
- ✓ Booked for surgery

- RANP performed 92 bubble studies with Cardiac Technicians (January '21-May '22).
- 18 positive bubble studies (20% positivity rate).
- 7 positive studies from January 2021 – August 2021 (pre pathway).
- 72% (5/7) had a TOE.

Audit of time frame from referral to closure

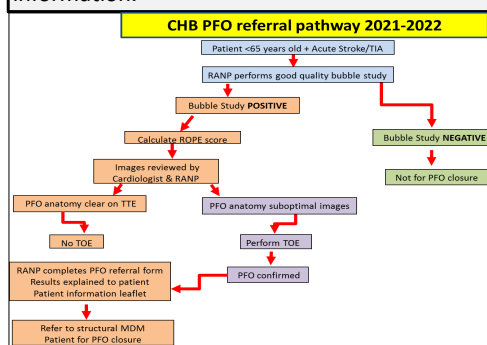
- 7 positive bubble studies Jan 2021 – Aug 2021
- Ages ranged between 37-57
- 3x – ROPE score <5 +/- TIA
- 4/7 TOE performed
- 1/7 referred for closure

Time to closure = 9 months

Method

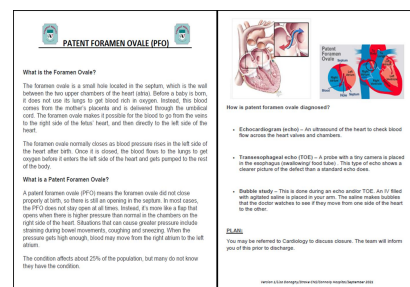
Pathway introduced September 2021

The Stroke RANP led out on the project as she performs all bubble studies with the technician. A designated Cardiologist, who also works in a hospital where PFO closures takes place, is notified by the RANP or team about a positive bubble study and the images are reviewed. It is then decided if the patients requires a TOE or not. A 2 page PFO referral form was created which contains all relevant information.



PFO Referral Form

CHB PFO Patient Information Leaflet



Results post pathway

Stroke RANP performed 92 bubble studies between January 2021 and May 2022. There were 18 positive studies (20% positivity rate): 7 positive studies from January to August 2021 (pre-pathway) and 11 positive studies from September 2021 to May 2022 (post-pathway).

72% (5/7) of patients had a TOE performed following a positive bubble study result pre pathway, whereas only 1 TOE was performed out of 11 cases (9%) post pathway.

The time from positive bubble study to closure time reduced from 9months on average to 3 months.

Conclusion

There was a 63% reduction in the number of TOEs being performed for patients with a positive bubble study with the introduction of this PFO pathway. Additionally, there was a 6 month reduction time from the positive bubble study result to closure. This pathway has improved patient outcomes for this young group of stroke survivors and assists with the reduction of further stroke events in the future.

Key Results

6 month
reduction time
from positive
bubble study to
closure.

63%
reduction in
TOE's

References

Irish National Audit for Stroke (2021) <https://www.noca.ie/documents/irish-national-audit-of-stroke-national-report-2021> Accessed on 7th October 2022.
Kottoo S.J. & Arora, R.R. (2018) "Cryptogenic Stroke: To Close a Patent Foramen Ovale or Not to Close?", Journal of Central Nervous System Disease, Volume 10, pp. 1-9.

Clinical Audit of Mood Screen and Delirium Screen in Stroke in UHL

V. McCarthy¹, E. Breen², A. Cullinane³, E. Vaughan⁴, N. Anish⁵, S. Paulose⁶, Dr C. Quinn⁷, Pr. M. O'Connor⁷

¹ Snr Clinical psychologist, ² Snr Occupational Therapist, ³ Snr Physiotherapist, ⁴ Speech and Language Therapist, ⁵ Snr nurse, ⁶ Stroke Clinical Nurse Specialist, ⁷ Clinical Leads

Introduction

Mood

- NICE guidelines advocate the stepped care approach for the identification and alleviation of mood issues following stroke.
- The whole team (Level 1) should be skilled in identifying psychological difficulties; and ensuring these difficulties are addressed appropriately.

Delirium

- 25% stroke patients present with delirium.
- No evidence-based recommendations have been established to date on how stroke patients should be routinely screened for delirium or which particular tool should be used.

Purpose

- To improve (Level 1) mood screening; in line with stroke standards.
- To establish a standard of practice in delirium screen for stroke patients during their inpatient stay on the stroke ward in UHL.

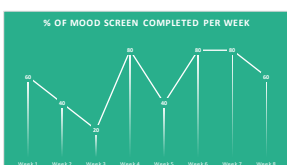
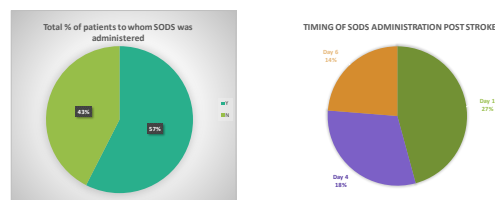
Methodology



Objectives

- To establish the screening rate for mood on the stroke ward.
 - The national standard required that all patients (100%) be screened for mood during their inpatient stay or before discharge home or transfer to another facility (NICE Guidelines, 2011).
 - Our target was for 80% of stroke patients to be mood screened.
- To establish the screening rate for delirium on the stroke ward.
 - In the absence of any national or international standard for delirium in stroke, a target of 80% of stroke patients to be screened for delirium was selected.

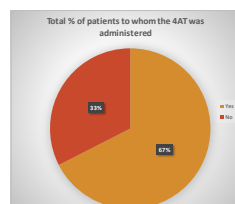
Mood Screen Results



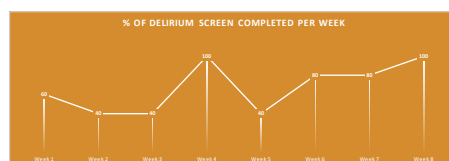
Referral to Psychology

- 35% of the audited cohort received a psychology referral
- 13% were not screened but were referred to psychology

Delirium Screen Results



- 17.5% not able for the 4AT due to:
 - Being physically unwell
 - Low levels of consciousness
 - Severe cognitive difficulties
 - Severe Aphasia



REFERENCES

- Mood**
- Bennett & al. (2006). Validation of screening measures for assessing mood in stroke patients; Br J Clin Psychol, Sep;45(Pt 3):367-76.
- Gilham, S., & Clark, L. (2011). Psychological care after stroke: Improving stroke services for people with cognitive and mood disorders. Leicester: NHS Improvement: Stroke. Retrieved March 2017, from https://www.nice.org.uk/media/default/0/4/5/531_strokepsychologicalsupportfinal.pdf
- Hammond & al., (2000). Development and validation of a brief observer-rated screening scale for depression in elderly medical patients. Age and ageing: 29,511-515
- National Clinical guideline for stroke: Prepared by the intercollegiate working party- Fifth Edition, 2016. Royal College of Physicians (RCP), NICE accredited.
- Quinn & al. (2018). Cognitive and Mood Assessment Tools for Use in Stroke. Stroke;49:483-490
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- Delirium**
- Lees, R., & al. (2013). Tests accuracy of short screening tests for diagnosis of delirium or cognitive impairment in an acute stroke unit setting. Stroke AHA, Volume 44, Issue 11, November 2013; Pages 3078-3083.
- Mansutti & al. (2019). Delirium in patients with ischaemic and haemorrhagic stroke: findings from a scoping review. Eur J Cardiovasc Nurs; Aug;18(6):435-448.
- Pendlebury, S. (2021). Screening for delirium in Acute Stroke. Stroke AHA, Volume 52, Issue 2, February 2021; Pages 479-481.

Outcome 1

Obstacles

- ICU/HDU transfer
- Medically unwell
- Staff rotation

Actions

- Modify the pro forma (Y/N section)
- Training on the proforma at induction for staff rotations

Outcome 2

Obstacles

- Query validity of a mood screen if completed too early
- SODS only screening for mood not for anxiety

Actions

- To repeat the mood screen at a later stage in the inpatient stay
- To consider a tool which includes a screen for anxiety

Outcome 3

Observations

- Referral to psychology not dependent on SODS score
- Reduced repeat assessment of 4AT for score of ≥ 4 (within 24 hrs) due to staffing levels

Actions

- To resume training on emotional changes post stroke, to develop skills for all the staff on the ward and increase number of staff able to recognise and screen for emotional needs.
- To resume training on delirium and teach staff how to administer 4AT. To increase number of staff able to recognise delirium and administer the screening tool.

APPENDIX 12: INAS NATIONAL REPORT 2022 FREQUENCY TABLES

FIGURE 4. 2: DISTRIBUTION OF TIME FROM WITNESSED STROKE SYMPTOM ONSET TO HOSPITAL ARRIVAL (n=3,040)

| | N | % |
|--------------|-------------|---------------|
| <3 hours | 1508 | 49.6% |
| 3–4.5 hours | 319 | 10.5% |
| 4.5–12 hours | 536 | 17.6% |
| >12 hours | 677 | 22.3% |
| Total | 3040 | 100.0% |

FIGURE 4. 3: THE PROPORTION OF PATIENTS WITH A STROKE WHO RECEIVED BRAIN IMAGING WITHIN 1 HOUR OF HOSPITAL ARRIVAL, BY HOSPITAL (n=4646)

| | Within 60 minutes | | After 60 minutes | | Unknown | | Total | |
|---|-------------------|--------------|------------------|--------------|-----------|-------------|-------------|---------------|
| | N | % | N | % | N | % | N | % |
| Bantry General Hospital | 41 | 58.6% | 29 | 41.4% | 0 | 0.0% | 70 | 100.0% |
| Beaumont Hospital | 183 | 52.9% | * | * | ~ | 0.6% | 346 | 100.0% |
| Cavan General Hospital | * | * | 96 | 59.6% | ~ | 0.6% | 161 | 100.0% |
| Connolly Hospital | 59 | 38.1% | 96 | 61.9% | 0 | 0.0% | 155 | 100.0% |
| Cork University Hospital | 254 | 54.6% | 200 | 43.0% | 11 | 2.4% | 465 | 100.0% |
| Letterkenny University Hospital | 95 | 47.7% | 104 | 52.3% | 0 | 0.0% | 199 | 100.0% |
| Mater Misericordiae University Hospital | 175 | 66.0% | 90 | 34.0% | 0 | 0.0% | 265 | 100.0% |
| Naas General Hospital | 102 | 56.4% | * | * | ~ | 0.6% | 181 | 100.0% |
| Our Lady of Lourdes Hospital Drogheda | 113 | 48.3% | 121 | 51.7% | 0 | 0.0% | 234 | 100.0% |
| Portiuncula University Hospital | ~ | * | 62 | 89.9% | ~ | 5.8% | 69 | 100.0% |
| Sligo University Hospital | 58 | 33.7% | 114 | 66.3% | 0 | 0.0% | 172 | 100.0% |
| Tipperary University Hospital | 71 | 55.5% | 57 | 44.5% | 0 | 0.0% | 128 | 100.0% |
| St James's Hospital | * | * | 118 | 52.2% | ~ | 0.4% | 226 | 100.0% |
| St Luke's General Hospital, Carlow/Kilkenny | * | * | 71 | 58.7% | ~ | 3.3% | 121 | 100.0% |
| St Vincent's University Hospital | 264 | 61.4% | * | * | ~ | 0.9% | 430 | 100.0% |
| Tallaght University Hospital | 148 | 50.7% | * | * | ~ | 0.3% | 292 | 100.0% |
| University Hospital Galway | 154 | 62.9% | 85 | 34.7% | 6 | 2.4% | 245 | 100.0% |
| University Hospital Kerry | 69 | 51.5% | * | * | ~ | 2.2% | 134 | 100.0% |
| University Hospital Limerick | 219 | 52.3% | 200 | 47.7% | 0 | 0.0% | 419 | 100.0% |
| University Hospital Waterford | * | * | 104 | 59.8% | ~ | 1.1% | 174 | 100.0% |
| Wexford General Hospital | * | * | 121 | 75.6% | 0 | 0.0% | 160 | 100.0% |
| Total | 2332 | 50.2% | 2274 | 48.9% | 40 | 0.9% | 4646 | 100.0% |

~ Denotes five cases or fewer

* Further suppression required in order to prevent disclosure of five cases or fewer

FIGURE 4. 4: TIME INTERVALS BETWEEN HOSPITAL ARRIVAL TIME AND TIME OF THROMBOLYSIS, BY HOSPITAL (n=419)

| | Less than 45 minutes | | 46 to 60 minutes | | More than 60 minutes | | Unknown | | Total | |
|---|----------------------|--------------|------------------|--------------|----------------------|--------------|----------|----------|------------|---------------|
| | N | % | N | % | N | % | N | % | N | % |
| Bantry General Hospital | ~ | * | 0 | 0.0% | ~ | * | 0 | 0.0% | ~ | 100.0% |
| Beaumont Hospital | 30 | 61.2% | 6 | 12.2% | 13 | 26.5% | 0 | 0.0% | 49 | 100.0% |
| Cavan General Hospital | ~ | * | ~ | * | 11 | 64.7% | 0 | 0.0% | 17 | 100.0% |
| Connolly Hospital | 9 | 100.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 9 | 100.0% |
| Cork University Hospital | 11 | 32.4% | 6 | 17.6% | 17 | 50.0% | 0 | 0.0% | 34 | 100.0% |
| Letterkenny University Hospital | 16 | 53.3% | * | * | ~ | * | 0 | 0.0% | 30 | 100.0% |
| Mater Misericordiae University Hospital | * | * | 12 | 28.6% | 18 | 42.9% | ~ | * | 42 | 100.0% |
| Naas General Hospital | 9 | 52.9% | ~ | * | ~ | * | 0 | 0.0% | 17 | 100.0% |
| Our Lady of Lourdes Hospital Drogheda | 9 | 42.9% | ~ | * | * | * | 0 | 0.0% | 21 | 100.0% |
| Portiuncula University Hospital | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | ~ | * | ~ | 100.0% |
| Sligo University Hospital | ~ | * | ~ | * | 0 | 0.0% | 0 | 0.0% | ~ | 100.0% |
| Tipperary University Hospital | ~ | * | ~ | * | 7 | 53.8% | 0 | 0.0% | 13 | 100.0% |
| St James's Hospital | ~ | * | ~ | * | 11 | 64.7% | 0 | 0.0% | 17 | 100.0% |
| St Luke's General Hospital, Carlow/Kilkenny | ~ | * | ~ | * | ~ | * | 0 | 0.0% | 9 | 100.0% |
| St Vincent's University Hospital | 12 | 54.5% | 6 | 27.3% | ~ | * | 0 | 0.0% | 22 | 100.0% |
| Tallaght University Hospital | 10 | 50.0% | ~ | * | * | * | 0 | 0.0% | 20 | 100.0% |
| University Hospital Galway | 13 | 56.5% | ~ | * | ~ | * | ~ | * | 23 | 100.0% |
| University Hospital Kerry | ~ | * | ~ | 27.3% | 7 | 63.6% | 0 | 0.0% | 11 | 100.0% |
| University Hospital Limerick | 8 | 19.0% | 6 | 14.3% | 28 | 66.7% | 0 | 0.0% | 42 | 100.0% |
| University Hospital Waterford | ~ | * | ~ | 5.3% | 13 | 68.4% | ~ | * | 19 | 100.0% |
| Wexford General Hospital | ~ | * | ~ | 33.3% | 8 | 53.3% | 0 | 0.0% | 15 | 100.0% |
| Total | 162 | 38.8% | 85 | 20.3% | 168 | 40.2% | ~ | * | 419 | 100.0% |

~ Denotes five cases or fewer

* Further suppression required in order to prevent disclosure of five cases or fewer

FIGURE 4. 5: ADMISSION TO A STROKE UNIT, BY HOSPITAL (N=4999)

| | Yes | | No | | Total | |
|---|-------------|--------------|-------------|--------------|-------------|---------------|
| | N | % | N | % | N | % |
| Bantry General Hospital | 50 | 69.4% | 22 | 30.6% | 72 | 100.0% |
| Beaumont Hospital | 433 | 83.8% | 84 | 16.2% | 517 | 100.0% |
| Cavan General Hospital | 127 | 78.4% | 35 | 21.6% | 162 | 100.0% |
| Connolly Hospital | 58 | 29.0% | 142 | 71.0% | 200 | 100.0% |
| Cork University Hospital | 397 | 77.8% | 113 | 22.2% | 510 | 100.0% |
| Letterkenny University Hospital | 160 | 79.6% | 41 | 20.4% | 201 | 100.0% |
| Mater Misericordiae University Hospital | 224 | 79.7% | 57 | 20.3% | 281 | 100.0% |
| Naas General Hospital | 110 | 57.9% | 80 | 42.1% | 190 | 100.0% |
| Our Lady of Lourdes Hospital Drogheda | 185 | 77.7% | 53 | 22.3% | 238 | 100.0% |
| Portiuncula University Hospital | 20 | 27.4% | 53 | 72.6% | 73 | 100.0% |
| Sligo University Hospital | 156 | 88.1% | 21 | 11.9% | 177 | 100.0% |
| Tipperary University Hospital | 110 | 84.0% | 21 | 16.0% | 131 | 100.0% |
| St James's Hospital | 147 | 64.5% | 81 | 35.5% | 228 | 100.0% |
| St Luke's General Hospital, Carlow/Kilkenny | 104 | 86.0% | 17 | 14.0% | 121 | 100.0% |
| St Vincent's University Hospital | 214 | 48.9% | 224 | 51.1% | 438 | 100.0% |
| Tallaght University Hospital | 249 | 83.8% | 48 | 16.2% | 297 | 100.0% |
| University Hospital Galway | 169 | 66.3% | 86 | 33.7% | 255 | 100.0% |
| University Hospital Kerry | 89 | 65.9% | 46 | 34.1% | 135 | 100.0% |
| University Hospital Limerick | 292 | 68.4% | 135 | 31.6% | 427 | 100.0% |
| University Hospital Waterford | 105 | 59.7% | 71 | 40.3% | 176 | 100.0% |
| Wexford General Hospital | 56 | 32.9% | 114 | 67.1% | 170 | 100.0% |
| Total | 3455 | 69.1% | 1544 | 30.9% | 4999 | 100.0% |

FIGURE 4. 6: SWALLOW SCREENING, BY HOSPITAL (N=4999)

| | Yes—had swallow screen performed | | No—did not have swallow screen performed | | Unknown | | Total | |
|---|----------------------------------|------|--|-----|---------|-----|-------|------|
| | N | % | N | % | N | % | N | % |
| Bantry General Hospital | 62 | 86% | 10 | 14% | 0 | 0% | 72 | 100% |
| Beaumont Hospital | 461 | 89% | * | * | ~ | * | 517 | 100% |
| Cavan General Hospital | * | * | 82 | 51% | ~ | * | 162 | 100% |
| Connolly Hospital | 200 | 100% | 0 | 0% | 0 | 0% | 200 | 100% |
| Cork University Hospital | 435 | 85% | 62 | 12% | 13 | 3% | 510 | 100% |
| Letterkenny University Hospital | 52 | 26% | 149 | 74% | 0 | 0% | 201 | 100% |
| Mater Misericordiae University Hospital | 207 | 74% | 68 | 24% | 6 | 2% | 281 | 100% |
| Naas General Hospital | 68 | 36% | 80 | 42% | 42 | 22% | 190 | 100% |
| Our Lady of Lourdes Hospital Drogheda | 169 | 71% | 53 | 22% | 16 | 7% | 238 | 100% |
| Portiuncula University Hospital | 32 | 44% | 31 | 42% | 10 | 14% | 73 | 100% |
| Sligo University Hospital | 160 | 90% | * | * | ~ | * | 177 | 100% |
| Tipperary University Hospital | 66 | 50% | 65 | 50% | 0 | 0% | 131 | 100% |
| St James's Hospital | 147 | 64% | 81 | 36% | 0 | 0% | 228 | 100% |
| St Luke's General Hospital, Carlow/Kilkenny | * | * | 65 | 54% | ~ | * | 121 | 100% |
| St Vincent's University Hospital | 224 | 51% | * | * | ~ | * | 438 | 100% |
| Tallaght University Hospital | 280 | 94% | * | * | ~ | * | 297 | 100% |
| University Hospital Galway | 137 | 54% | 108 | 42% | 10 | 4% | 255 | 100% |

| | | | | | | | | |
|-------------------------------|-------------|------------|-------------|------------|------------|-----------|-------------|-------------|
| University Hospital Kerry | 100 | 74% | * | * | ~ | * | 135 | 100% |
| University Hospital Limerick | 381 | 89% | * | * | ~ | * | 427 | 100% |
| University Hospital Waterford | 107 | 61% | 44 | 25% | 25 | 14% | 176 | 100% |
| Wexford General Hospital | 114 | 67% | 56 | 33% | 0 | 0% | 170 | 100% |
| Total | 3532 | 71% | 1320 | 26% | 147 | 3% | 4999 | 100% |

~ Denotes five cases or fewer

* Further suppression required in order to prevent disclosure of five cases or fewer

FIGURE 4. 7: PROPORTION OF CASES ASSESSED BY A PHYSIOTHERAPIST, OCCUPATIONAL THERAPIST AND SPEECH AND LANGUAGE THERAPIST WITH ADDITIONAL HEALTH AND SOCIAL CARE PROFESSIONAL DATA SUBMITTED, BY HOSPITAL

| | Physiotherapy (PT) | | | Occupational therapy (OT) | | | Speech and language therapy (SLT) | | |
|---|----------------------|--------------------|------------|---------------------------|--------------------|------------|-----------------------------------|---------------------|------------|
| | Cases referred to PT | Cases with PT data | % | Cases referred to OT | Cases with OT data | % | Cases referred to SLT | Cases with SLT data | % |
| Naas General Hospital | 162 | 113 | 70% | 162 | 117 | 72% | 116 | 75 | 65% |
| St James's Hospital | 194 | 159 | 82% | 193 | 177 | 92% | 143 | 0 | 0% |
| Tallaght University Hospital | 259 | 156 | 60% | 234 | 0 | 0% | 193 | 93 | 48% |
| Mater Misericordiae University Hospital | 226 | 179 | 79% | 233 | 186 | 80% | 174 | 142 | 82% |
| St Luke's General Hospital Kilkenny | 105 | * | * | 105 | 60 | 57% | 75 | 66 | 88% |
| St. Vincent's University Hospital | 394 | 196 | 50% | 388 | 95 | 24% | 267 | 95 | 36% |
| Wexford General Hospital | 144 | 0 | 0% | 112 | 0 | 0% | 116 | 0 | 0% |
| Beaumont Hospital | 390 | 261 | 67% | 380 | 305 | 80% | 326 | 224 | 69% |
| Cavan General Hospital | 133 | 0 | 0% | 104 | 0 | 0% | 79 | 0 | 0% |
| Connolly Hospital | 168 | 105 | 63% | 165 | 54 | 33% | 106 | 92 | 87% |
| Our Lady Of Lourdes Hospital, Drogheda | 173 | 118 | 68% | 191 | 148 | 77% | 147 | 106 | 72% |
| Letterkenny university hospital | 191 | 0 | 0% | 169 | 0 | 0% | 126 | 0 | 0% |
| Portiuncula University Hospital | 50 | 0 | 0% | 44 | 0 | 0% | 26 | 0 | 0% |
| Sligo University Hospital | 130 | ~ | * | 139 | 18 | 13% | 76 | 0 | 0% |
| University Hospital Galway | 221 | 129 | 58% | 215 | 0 | 0% | 163 | 10 | 6% |
| Bantry General Hospital | 40 | 0 | 0% | 37 | 0 | 0% | 33 | 0 | 0% |
| Cork University Hospital | 403 | 220 | 55% | 388 | 296 | 76% | 330 | 268 | 81% |
| Tipperary University Hospital | 117 | 0 | 0% | 67 | 20 | 30% | 107 | ~ | * |
| University Hospital Kerry | 129 | 33 | 26% | 121 | 15 | 12% | 102 | * | * |
| University Hospital Waterford | 143 | 0 | 0% | 134 | 0 | 0% | 91 | 0 | 0% |
| University Hospital Limerick | 391 | 239 | 61% | 375 | 146 | 39% | 302 | 224 | 74% |
| Total | 4163 | 1943 | 47% | 3956 | 1637 | 41% | 3098 | 1426 | 46% |

~ Denotes five cases or fewer

* Further suppression required in order to prevent disclosure of five cases or fewer

FIGURE 4. 8: PERCENTAGE OF BED DAYS SPENT IN A STROKE UNIT FOR PATIENTS WHO SPENT ALL OR SOME OF THEIR HOSPITAL STAY IN A STROKE UNIT (n= 69257)

| | N of patients | Total LOS in hospital | Total LOS in stroke unit | % |
|---|---------------|-----------------------|--------------------------|------------|
| Naas General Hospital | 110 | 3100 | 2684 | 87% |
| St James's Hospital | 147 | 1740 | 990 | 57% |
| Tallaght University Hospital | 249 | 4277 | 2020 | 47% |
| Mater Misericordiae University Hospital | 224 | 3532 | 2464 | 70% |
| St Luke's General Hospital, Carlow/Kilkenny | 104 | 1770 | 1090 | 62% |
| St Vincent's University Hospital | 206 | 6240 | 3961 | 63% |
| Wexford General Hospital | 56 | 1521 | 923 | 61% |
| Beaumont Hospital | 433 | 6733 | 4579 | 68% |
| Cavan General Hospital | 126 | 1908 | 1244 | 65% |
| Connolly Hospital | 55 | 1518 | 735 | 48% |
| Our Lady of Lourdes Hospital Drogheda | 185 | 3379 | 2790 | 83% |
| Letterkenny University Hospital | 148 | 4035 | 1203 | 30% |
| Portiuncula University Hospital | 15 | 103 | 86 | 83% |
| Sligo University Hospital | 156 | 2097 | 1934 | 92% |
| University Hospital Galway | 165 | 4294 | 1846 | 43% |
| Bantry General Hospital | 50 | 1836 | 1782 | 97% |
| Cork University Hospital | 395 | 9700 | 8048 | 83% |
| Tipperary University Hospital | 109 | 2004 | 1332 | 66% |
| University Hospital Kerry | 86 | 944 | 574 | 61% |
| University Hospital Waterford | 105 | 2051 | 1344 | 66% |
| University Hospital Limerick | 292 | 6475 | 5287 | 82% |
| Total | 3416 | 69257 | 46916 | 68% |

FIGURE 4. 9: MODIFIED RANKIN SCALE SCORES IN PATIENTS WITH ISCHAEMIC STROKE, PRE-STROKE AND ON DISCHARGE FROM ACUTE HOSPITAL (n=4272)

| | | N | % |
|---------------------------------------|---|-------------|---------------|
| Modified Rankin Score - before stroke | No disability (0) | 2723 | 63.7% |
| | Mild disability (1, 2) | 789 | 18.5% |
| | Moderate to severe disability (3, 4, 5) | 633 | 14.8% |
| | Died (6) | 0 | 0.0% |
| | Unknown | 127 | 3.0% |
| | Total | 4272 | 100.0% |
| Modified Rankin Scores on discharge | No disability (0) | 939 | 22.0% |
| | Mild disability (1, 2) | 1441 | 33.7% |
| | Moderate to severe disability (3, 4, 5) | 1408 | 33.0% |
| | Died (6) | 328 | 7.7% |
| | Unknown | 156 | 3.7% |

| | | | |
|--|-------|------|--------|
| | Total | 4272 | 100.0% |
|--|-------|------|--------|

FIGURE 4. 10: MODIFIED RANKIN SCALE SCORES IN PATIENTS WITH HAEMORRHAGIC STROKE, PRE-STROKE AND ON DISCHARGE FROM ACUTE HOSPITAL (n=727)

| | | N | % |
|---------------------------------------|---|-----|--------|
| Modified Rankin Score - before stroke | No disability (0) | 409 | 56.3% |
| | Mild disability (1, 2) | 151 | 20.8% |
| | Moderate to severe disability (3, 4, 5) | 140 | 19.3% |
| | Died (6) | 0 | 0.0% |
| | Unknown | 27 | 3.7% |
| | Total | 727 | 100.0% |
| Modified Rankin Scores on discharge | No disability (0) | 59 | 8.1% |
| | Mild disability (1, 2) | 152 | 20.9% |
| | Moderate to severe disability (3, 4, 5) | 277 | 38.1% |
| | Died (6) | 219 | 30.1% |
| | Unknown | 20 | 2.8% |
| | Total | 727 | 100.0% |

FIGURE 4. 11: PHYSIOTHERAPY MOBILITY OUTCOMES (N=2307)

| | | N | % |
|-------------------------------|--|------|--------|
| Indoor mobility pre-admission | Independent, with no aid | 1751 | 75.9% |
| | Independent, with aid | 336 | 14.6% |
| | Supervision or assistance of one person, with or without aid | 128 | 5.5% |
| | Transfer only with assistance | 33 | 1.4% |
| | Hoist transfer | 23 | 1.0% |
| | Unknown | 36 | 1.6% |
| | Total | 2307 | 100.0% |
| indoor mobility on discharge | Independent, with no aid | 998 | 43.3% |
| | Independent, with aid | 283 | 12.3% |
| | Supervision or assistance of one person, with or without aid | 434 | 18.8% |
| | Transfer only with assistance | 182 | 7.9% |
| | Hoist transfer | 221 | 9.6% |
| | Died | 122 | 5.3% |
| | Unknown | 67 | 2.9% |
| | Total | 2307 | 100.0% |

FIGURE 4. 12: OCCUPATIONAL THERAPY ACTIVITIES OF DAILY LIVING OUTCOMES (N=2012)

| | | N | % |
|------------------------------------|--------------------------------|------|--------|
| Activities of living pre-admission | Independent | 1490 | 74.1% |
| | Independent with cues/aids | 82 | 4.1% |
| | Required supervision or set-up | 107 | 5.3% |
| | Required assistance | 200 | 9.9% |
| | Dependent/full care | 50 | 2.5% |
| | Unknown | 83 | 4.1% |
| | Total | 2012 | 100.0% |
| Activities of living on discharge | N/A RIP | 92 | 4.6% |
| | Independent | 803 | 39.9% |
| | Independent with cues/aids | 134 | 6.7% |
| | Required supervision or set-up | 214 | 10.6% |
| | Required assistance | 417 | 20.7% |
| | Dependent/full care | 262 | 13.0% |
| | Unknown | 90 | 4.5% |
| | Total | 2012 | 100.0% |

FIGURE 4. 13: SPEECH AND LANGUAGE THERAPY PRE AND POST STROKE COMMUNICATION ABILITY OUTCOMES (N=1660)

| | | N | % |
|---|--|------|--------|
| Functional communication ability prior to admission | No difficulties | 1293 | 77.9% |
| | Mild: >80% effective communication; occasional breakdown in conversation | 217 | 13.1% |
| | Moderate: 50–79% effective communication; frequent breakdown in conversation | 85 | 5.1% |
| | Severe: Less than half (10–49%) of communication attempts are successful | 19 | 1.1% |
| | Profound: No, or occasional (<10%), communication attempts are successful | 8 | 0.5% |
| | Unknown | 38 | 2.3% |
| | Total | 1660 | 100.0% |
| Functional communication ability at discharge | Died | 134 | 8.1% |
| | No difficulties | 539 | 32.5% |
| | Mild: >80% effective communication; occasional breakdown in conversation | 510 | 30.7% |
| | Moderate: 50–79% effective communication; frequent breakdown in conversation | 277 | 16.7% |
| | Severe: Less than half (10–49%) of communication attempts are successful | 123 | 7.4% |

| | | | |
|--|---|------|--------|
| | Profound: No, or occasional (<10%), communication attempts are successful | 51 | 3.1% |
| | Unknown | 26 | 1.6% |
| | Total | 1660 | 100.0% |

FIGURE 4. 14: DISCHARGE DESTINATION FROM ACUTE HOSPITAL FOR ALL PATIENTS WITH A STROKE (N=4999)

| | N | % |
|--------------------------------------|-------------|---------------|
| Home | 2483 | 49.7% |
| Home with ESD | 489 | 9.8% |
| Discharged to long term care | 364 | 7.3% |
| Discharge to off-site rehabilitation | 580 | 11.6% |
| Transferred | 398 | 8.0% |
| Died | 540 | 10.8% |
| Other/unknown | 145 | 2.9% |
| Total | 4999 | 100.0% |

FIGURE 4. 15: ONWARD REFERRAL, BY DISCIPLINE (N=3256)

| | Physiotherapy | | Occupational therapy | | Speech and language therapy | |
|--------------------------|---------------|---------------|----------------------|---------------|-----------------------------|---------------|
| | N | % | N | % | N | % |
| No onward referral | 1035 | 44.9% | 930 | 46.2% | 885 | 53.3% |
| Inpatient rehabilitation | 433 | 18.8% | 318 | 15.8% | 203 | 12.2% |
| Community rehabilitation | 162 | 7.0% | 174 | 8.6% | 246 | 14.8% |
| ESD | 263 | 11.4% | 233 | 11.6% | 122 | 7.3% |
| Other | 312 | 13.5% | 166 | 8.3% | 182 | 11.0% |
| Unknown | 102 | 4.4% | 191 | 9.5% | 22 | 1.3% |
| Total | 2307 | 100.0% | 2012 | 100.0% | 1660 | 100.0% |

FIGURE 5.1: PROPORTION OF PATIENTS WITH ISCHAEMIC AND HAEMORRHAGIC STROKE WHO HAD ATRIAL FIBRILLATION, BY YEAR (N=39629)

| | | Ischaemic Stroke | | Haemorrhagic Stroke | | Total | |
|-------|-----------------|------------------|----------------|---------------------|----------------|--------------|----------------|
| | | N | % | N | % | N | % |
| 2013 | Yes | 783 | 31.30% | 62 | 21.60% | 845 | 30.30% |
| | No | 1499 | 59.90% | 179 | 62.40% | 1678 | 60.10% |
| | Results Pending | * | * | ~ | * | 48 | 1.70% |
| | Unknown | 174 | 7.00% | * | * | 219 | 7.80% |
| | Total | 2503 | 100.00% | 287 | 100.00% | 2790 | 100.00% |
| 2014 | Yes | 887 | 31.20% | 66 | 15.80% | 953 | 29.20% |
| | No | 1722 | 60.60% | 300 | 71.60% | 2022 | 62.00% |
| | Results Pending | * | * | ~ | * | 42 | 1.30% |
| | Unknown | 190 | 6.70% | * | * | 242 | 7.40% |
| | Total | 2840 | 100.00% | 419 | 100.00% | 3259 | 100.00% |
| 2015 | Yes | 971 | 33.60% | 97 | 22.20% | 1068 | 32.10% |
| | No | 1680 | 58.20% | 280 | 64.10% | 1960 | 58.90% |
| | Results Pending | * | * | ~ | * | 65 | 2.00% |
| | Unknown | 175 | 6.10% | * | * | 233 | 7.00% |
| | Total | 2889 | 100.00% | 437 | 100.00% | 3326 | 100.00% |
| 2016 | Yes | 981 | 31.60% | 88 | 19.00% | 1069 | 30.00% |
| | No | 1826 | 58.80% | 341 | 73.80% | 2167 | 60.70% |
| | Results Pending | * | * | ~ | * | 166 | 4.70% |
| | Unknown | 137 | 4.40% | * | * | 167 | 4.70% |
| | Total | 3107 | 100.00% | 462 | 100.00% | 3569 | 100.00% |
| 2017 | Yes | 982 | 32.20% | 106 | 23.60% | 1088 | 31.10% |
| | No | 1753 | 57.40% | 298 | 66.20% | 2051 | 58.60% |
| | Results Pending | * | * | ~ | * | 151 | 4.30% |
| | Unknown | 168 | 5.50% | * | * | 212 | 6.10% |
| | Total | 3052 | 100.00% | 450 | 100.00% | 3502 | 100.00% |
| 2018 | Yes | 951 | 29.50% | 106 | 20.90% | 1057 | 28.30% |
| | No | 1843 | 57.20% | 340 | 67.10% | 2183 | 58.50% |
| | Results Pending | * | * | ~ | * | 190 | 5.10% |
| | Unknown | 244 | 7.60% | * | * | 300 | 8.00% |
| | Total | 3223 | 100.00% | 507 | 100.00% | 3730 | 100.00% |
| 2019 | Yes | 1096 | 30.30% | 141 | 23.40% | 1237 | 29.30% |
| | No | 2079 | 57.40% | 377 | 62.50% | 2456 | 58.10% |
| | Results Pending | * | * | ~ | * | 223 | 5.30% |
| | Unknown | 229 | 6.30% | * | * | 310 | 7.30% |
| | Total | 3623 | 100.00% | 603 | 100.00% | 4226 | 100.00% |
| 2020 | Yes | 1217 | 28.70% | 142 | 18.80% | 1359 | 27.20% |
| | No | 2718 | 64.20% | 537 | 71.20% | 3255 | 65.20% |
| | Results Pending | * | * | ~ | * | 108 | 2.20% |
| | Unknown | 193 | 4.60% | * | * | 267 | 5.40% |
| | Total | 4235 | 100.00% | 754 | 100.00% | 4989 | 100.00% |
| 2021 | Yes | 1191 | 26.50% | 149 | 20.20% | 1340 | 25.60% |
| | No | 2917 | 64.80% | 543 | 73.70% | 3460 | 66.00% |
| | Results Pending | * | * | ~ | * | 202 | 3.90% |
| | Unknown | 195 | 4.30% | * | * | 237 | 4.50% |
| | Total | 4502 | 100.00% | 737 | 100.00% | 5239 | 100.00% |
| 2022 | Yes | 1270 | 29.73% | 150 | 20.63% | 1420 | 28.41% |
| | No | 2540 | 59.46% | 518 | 71.25% | 3058 | 61.17% |
| | Results Pending | 261 | 6.11% | 11 | 1.51% | 272 | 5.44% |
| | Unknown | 201 | 4.71% | 48 | 6.60% | 249 | 4.98% |
| | Total | 4272 | 100.00% | 727 | 100.00% | 4999 | 100.00% |
| Total | Yes | 10329 | 30.16% | 1107 | 20.56% | 11436 | 28.86% |
| | No | 20577 | 60.09% | 3713 | 68.98% | 24290 | 61.29% |
| | Results Pending | 1434 | 4.19% | 33 | 0.61% | 1467 | 3.70% |
| | Unknown | 1906 | 5.57% | 530 | 9.85% | 2436 | 6.15% |
| | Total | 34246 | 100.00% | 5383 | 100.00% | 39629 | 100.00% |

~ Denotes five cases or fewer

* Further suppression required in order to prevent disclosure of five cases or fewer

FIGURE 5.3: DIRECT ORAL ANTICOAGULANT PRESCRIPTION DATA FOR PATIENTS WITH ISCHAEMIC AND HAEMORRHAGIC STROKE (n=597)

| | | Ischaemic stroke | Haemorrhagic stroke | Total |
|---------|---|------------------|---------------------|--------|
| Yes | N | 401 | 72 | 473 |
| | % | 79.4% | 78.3% | 79.2% |
| No | N | * | ~ | 35 |
| | % | * | * | 5.9% |
| Unknown | N | 70 | * | 89 |
| | % | 13.9% | * | 14.9% |
| Total | N | 505 | 92 | 597 |
| | % | 100.0% | 100.0% | 100.0% |

~ Denotes five cases or fewer

* Further suppression required in order to prevent disclosure of five cases or fewer

FIGURE 5.5: DISTRIBUTION OF PATIENTS IN EACH OF THE FIVE ATRIAL FIBRILLATION GROUPS (N=4999)

| | N | % |
|--|-------------|---------------|
| Group 1: No atrial fibrillation | 3058 | 61.2% |
| Group 2: Atrial fibrillation not known prior to stroke | 485 | 9.7% |
| Group 3: Atrial fibrillation known prior to stroke, on anticoagulation and no dosage/compliance concerns | 350 | 7.0% |
| Group 4: Atrial fibrillation known prior to stroke, on anticoagulation and with dosage/compliance concerns | 148 | 3.0% |
| Group 5: Atrial fibrillation known prior to stroke, not on anticoagulation | 163 | 3.3% |
| Other/unknown | 795 | 15.9% |
| Total | 4999 | 100.0% |

FIGURE Error! No text of specified style in document..1: SEX DISTRIBUTION FOR EACH OF THE FIVE ATRIAL FIBRILLATION GROUPS (n=4204)

| | Male | | Female | | Total | |
|--|-------------|--------------|-------------|--------------|-------------|---------------|
| | N | % | N | % | N | % |
| Group 1: No atrial fibrillation | 1749 | 57.2% | 1309 | 42.8% | 3058 | 100.0% |
| Group 2: Atrial fibrillation not known prior to stroke | 253 | 52.2% | 232 | 47.8% | 485 | 100.0% |
| Group 3: Atrial fibrillation known prior to stroke, on anticoagulation and no dosage/compliance concerns | 208 | 59.4% | 142 | 40.6% | 350 | 100.0% |
| Group 4: Atrial fibrillation known prior to stroke, on anticoagulation and with dosage/compliance concerns | 98 | 66.2% | 50 | 33.8% | 148 | 100.0% |
| Group 5: Atrial fibrillation known prior to stroke, not on anticoagulation | 97 | 59.5% | 66 | 40.5% | 163 | 100.0% |
| Total | 2405 | 57.2% | 1799 | 42.8% | 4204 | 100.0% |

FIGURE 5.7: AGE DISTRIBUTION FOR EACH OF THE FIVE ATRIAL FIBRILLATION GROUPS (n=4204)

| | | 50 years or less | 51-65 | 66-80 | 81-90 | 91 or more | Total |
|---------------------------------|---|------------------|-------|-------|-------|------------|--------|
| Group 1: No atrial fibrillation | N | 355 | 729 | 1240 | 624 | 110 | 3058 |
| | % | 11.6% | 23.8% | 40.5% | 20.4% | 3.6% | 100.0% |

| | | | | | | | |
|--|---|------|-------|-------|-------|------|--------|
| Group 2: Atrial fibrillation not known prior to stroke | N | 11 | 58 | 223 | 155 | 38 | 485 |
| | % | 2.3% | 12.0% | 46.0% | 32.0% | 7.8% | 100.0% |
| Group 3: Atrial fibrillation known prior to stroke, on anticoagulation and no dosage/compliance concerns | N | 0 | 19 | 149 | 157 | 25 | 350 |
| | % | 0.0% | 5.4% | 42.6% | 44.9% | 7.1% | 100.0% |
| Group 4: Atrial fibrillation known prior to stroke, on anticoagulation and with dosage/compliance concerns | N | ~ | * | 61 | 64 | * | 148 |
| | % | * | * | 41.2% | 43.2% | * | 100.0% |
| Group 5: Atrial fibrillation known prior to stroke, not on anticoagulation | N | ~ | * | 54 | 65 | * | 163 |
| | % | * | * | 33.1% | 39.9% | * | 100.0% |
| Total | N | 370 | 835 | 1727 | 1065 | 207 | 4204 |
| | % | 8.8% | 19.9% | 41.1% | 25.3% | 4.9% | 100.0% |

~ Denotes five cases or fewer

* Further suppression required in order to prevent disclosure of five cases or fewer

FIGURE 5.8: MODIFIED RANKIN SCALE SCORES IN PATIENTS WITH ISCHAEMIC STROKE, PRE-STROKE AND ON DISCHARGE, FOR EACH OF THE FIVE ATRIAL FIBRILLATION GROUPS (n=4204)

| | | Modified Rankin Score - before stroke | | Modified Rankin Scores on discharge | |
|--|---|---------------------------------------|---------------|-------------------------------------|---------------|
| | | N | % | N | % |
| Group 1: No atrial fibrillation | No disability (0) | 2024 | 66.2% | 684 | 22.4% |
| | Mild disability (1, 2) | 559 | 18.3% | 1054 | 34.5% |
| | Moderate to severe disability (3, 4, 5) | 394 | 12.9% | 947 | 31.0% |
| | Died (6) | 0 | 0.0% | 292 | 9.5% |
| | Unknown | 81 | 2.6% | 81 | 2.6% |
| | Total | 3058 | 100.0% | 3058 | 100.0% |
| Group 2: Atrial fibrillation not known prior to stroke | No disability (0) | 330 | 68.0% | 77 | 15.9% |
| | Mild disability (1, 2) | 66 | 13.6% | 157 | 32.4% |
| | Moderate to severe disability (3, 4, 5) | 69 | 14.2% | 184 | 37.9% |
| | Died (6) | 0 | 0.0% | 46 | 9.5% |
| | Unknown | 20 | 4.1% | 21 | 4.3% |
| | Total | 485 | 100.0% | 485 | 100.0% |
| Group 3: Atrial fibrillation known prior to stroke, on anticoagulation and no dosage/compliance concerns | No disability (0) | 160 | 45.7% | 42 | 12.0% |
| | Mild disability (1, 2) | 79 | 22.6% | 82 | 23.4% |
| | Moderate to severe disability (3, 4, 5) | 102 | 29.1% | 163 | 46.6% |
| | Died (6) | 0 | 0.0% | 57 | 16.3% |
| | Unknown | 9 | 2.6% | 6 | 1.7% |
| | Total | 350 | 100.0% | 350 | 100.0% |
| Group 4: Atrial fibrillation known prior to stroke, on anticoagulation and with dosage/compliance concerns | No disability (0) | 72 | 48.6% | 19 | 12.8% |
| | Mild disability (1, 2) | 38 | 25.7% | 39 | 26.4% |
| | Moderate to severe disability (3, 4, 5) | 31 | 20.9% | 59 | 39.9% |
| | Died (6) | 0 | 0.0% | 21 | 14.2% |
| | Unknown | 7 | 4.7% | 10 | 6.8% |
| | Total | 148 | 100.0% | 148 | 100.0% |
| Group 5: Atrial fibrillation known prior to stroke, not on anticoagulation | No disability (0) | * | * | * | * |
| | Mild disability (1, 2) | 38 | 23.3% | 35 | 21.5% |
| | Moderate to severe disability (3, 4, 5) | 62 | 38.0% | 78 | 47.9% |
| | Died (6) | 0 | 0.0% | 33 | 20.2% |
| | Unknown | ~ | * | ~ | * |
| | Total | 163 | 100.0% | 163 | 100.0% |
| Total | No disability (0) | 2647 | 63.0% | 836 | 19.9% |
| | Mild disability (1, 2) | 780 | 18.6% | 1367 | 32.5% |

| | | | | | |
|--|---|-------------|---------------|-------------|---------------|
| | Moderate to severe disability (3, 4, 5) | 658 | 15.7% | 1431 | 34.0% |
| | Died (6) | 0 | 0.0% | 449 | 10.7% |
| | Unknown | 119 | 2.8% | 121 | 2.9% |
| | Total | 4204 | 100.0% | 4204 | 100.0% |

~ Denotes five cases or fewer

* Further suppression required in order to prevent disclosure of five cases or fewer

FIGURE 5.9: DISCHARGE DESTINATION OF THE FIVE ATRIAL FIBRILLATION GROUPS (n=4204)

| | Home | | Home with ESD | | Discharged to long term care | | Discharge to off-site rehabilitation | | Transferred | | Died | | Other/unknown | | Total | |
|--|-------------|--------------|---------------|--------------|------------------------------|-------------|--------------------------------------|--------------|-------------|-------------|------------|--------------|---------------|-------------|-------------|-------------|
| | N | % | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| Group 1: No atrial fibrillation | 1623 | 53.1% | 331 | 10.8% | 182 | 6.0% | 358 | 11.7% | 192 | 6.3% | 288 | 9.4% | 84 | 2.7% | 3058 | 100% |
| Group 2: Atrial fibrillation not known prior to stroke | 225 | 46.4% | 55 | 11.3% | 52 | 10.7% | 71 | 14.6% | 24 | 4.9% | 44 | 9.1% | 14 | 2.9% | 485 | 100% |
| Group 3: Atrial fibrillation known prior to stroke, on anticoagulation and no dosage/compliance concerns | 150 | 42.9% | 34 | 9.7% | 34 | 9.7% | 48 | 13.7% | 20 | 5.7% | 57 | 16.3% | 7 | 2.0% | 350 | 100% |
| Group 4: Atrial fibrillation known prior to stroke, on anticoagulation and with dosage/compliance concerns | 63 | 42.6% | * | * | 20 | 13.5% | 21 | 14.2% | 11 | 7.4% | 21 | 14.2% | ~ | * | 148 | 100% |
| Group 5: Atrial fibrillation known prior to stroke, not on anticoagulation | 62 | 38.0% | 6 | 3.7% | 24 | 14.7% | 20 | 12.3% | 12 | 7.4% | 33 | 20.2% | * | * | 163 | 100% |
| Total | 2123 | 50.5% | 434 | 10.3% | 312 | 7.4% | 518 | 12.3% | 259 | 6.2% | 443 | 10.5% | 115 | 2.7% | 4204 | 100% |

~ Denotes five cases or fewer

* Further suppression required in order to prevent disclosure of five cases or fewer