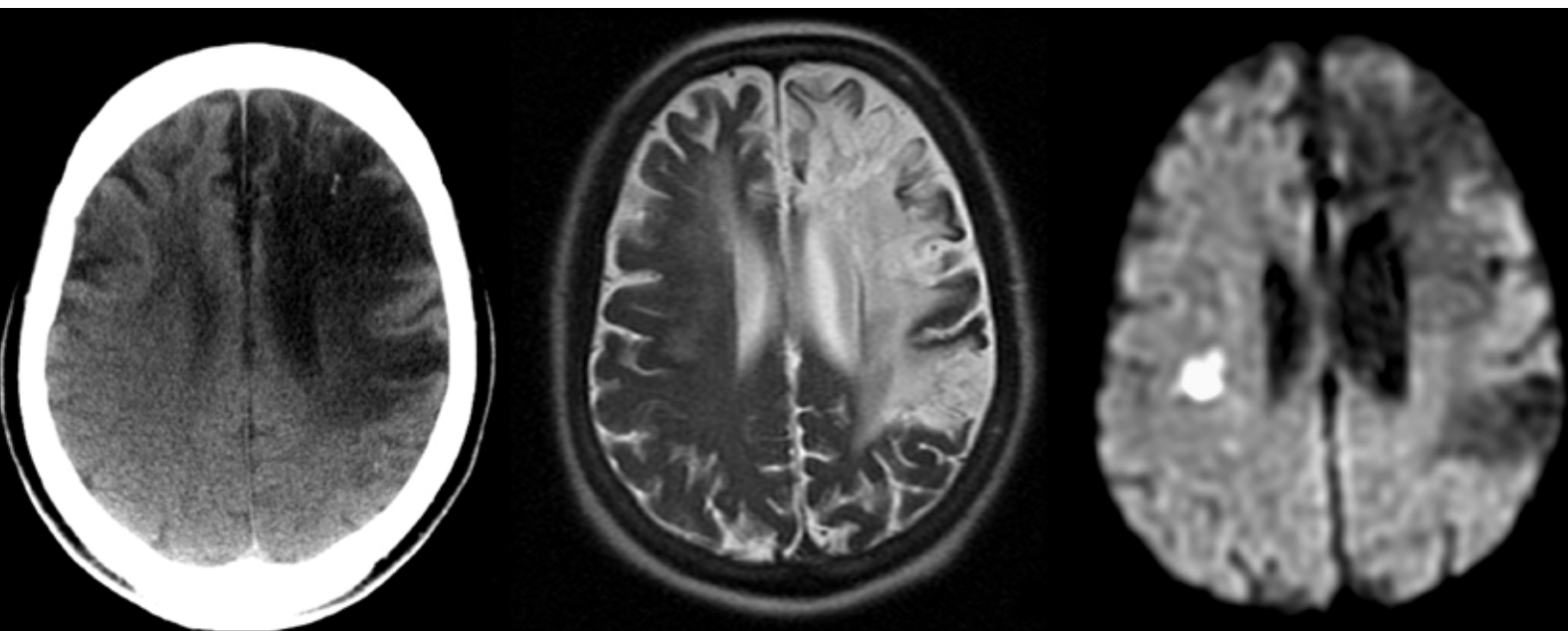




Scottish Stroke Care Audit 2009 National Report

Stroke Services in Scottish Hospitals
Data relating to 2007 -2008



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يمكن أن يتوفر هذا الإعلان بلغات مختلفة، وطباعة بحجم أكبر، وطباعة برايل (باللغة الإنجليزية فقط). للحصول على معلومات حول ترجمة هذا الإعلان بلغتك المحلية، يرجى الاتصال بالرقم الوارد أدناه.

یہ طبع مختلف زبانوں اور بڑے چھاب میں دستیاب کی جاسکتی ہے، برائلی (صرف انگریزی میں)۔ اپنی کمیونٹی کے زبان میں اس طبع کے ترجمے کے بارے میں معلومات حاصل کرنے کے لئے، براہ کرم مندرجہ ذیل نمبر پر فون کیجئے۔

Contents

List of charts	ii
1 Introduction	1
1.1 Organisational structure of the Scottish Stroke Care Audit.....	1
1.2 This report.....	2
1.2.1 New NHSQIS Standards	2
2 Future Plans	4
3 Inpatients	5
3.1 Summary and Key Findings relating to Inpatient Data	5
3.2 Stroke Unit Information	6
3.3 Scotland National Figures.....	8
3.3.1 Admission.....	8
3.3.2 Discharge	10
3.4 Hospital Data	11
4 Outpatients	17
4.1 Summary and Key Findings relating to Outpatient Data.....	17
4.2 Scotland National Figures.....	18
4.3 Hospital Data	21
List of References	25
Appendix A Minimum Dataset Definitions	26
Appendix B Steering Committee.....	33
Acknowledgements.....	34

List of charts

Chart 1	Percentage of stroke patients admitted to a stroke unit within one day of admission (NHSQIS Standard = 70%)	11
Chart 2	Percentage of stroke patients admitted to stroke unit by number of days to stroke unit admission, 2008 data	11
Chart 3	Mean delay (days) from admission to entry into any stroke unit	12
Chart 4	Percentage of stroke patients with a swallow screen on day of admission (NHSQIS Standard = 100%).....	12
Chart 5	Percentage of stroke patients with a swallow screening by number of days to swallow screening, 2008 data	13
Chart 6	Percentage of stroke patients with a brain scan within 2 days of admission (NHSQIS Standard = 80%).....	13
Chart 7	Percentage of stroke patients with a brain scan by number of days to scanning, 2008 data	14
Chart 8	Percentage of ischaemic patients given Aspirin within 2 days of admission (NHSQIS Standard = 100%).....	14
Chart 9	Percentage of ischaemic patients given Aspirin in hospital by number of days to receipt, 2008 data	15
Chart 10	Percentage of ischaemic patients discharged on Antiplatelet, Warfarin or in a relevant trial	15
Chart 11	Percentage of ischaemic patients discharged on Statin or in a relevant trial	16
Chart 12	Percentage of ischaemic patients in AF discharged on Warfarin or in a relevant trial	16
Chart 13	Mean (days) from receipt of referral to examination in neurovascular clinic	21
Chart 14	Percentage of patients with definite cerebrovascular diagnosis seen in neurovascular clinic with referral to examination time (days): same day and within 1, 2 and 3 days, 2008 data	21
Chart 15	Percentage of patients with days from receipt of referral to examination in neurovascular clinic within 7 days (NHSQIS Standard = 80%)	22
Chart 16	Percentage of patients with days from receipt of referral to examination in neurovascular clinic within 14 days (NHSQIS Standard = 80%)	22
Chart 17	Percentage of patients with definite cerebrovascular diagnosis with referral to examination in neurovascular clinic time (days) within 7 and 14 days, 2008 data.....	23
Chart 18	Mean (days) from examination in neurovascular clinic to 1st carotid duplex.....	23
Chart 19	Mean days from examination in neurovascular clinic to brain scan, for scan done	24

1 Introduction

Stroke is the third commonest cause of death in Scotland and the most common cause of severe physical disability amongst adults. It is estimated that about 15,000 people in Scotland have a stroke each year. Hospital care for these patients accounts for 7% of all NHS beds and 5% of the entire NHS budget.

The Scottish Government has identified stroke as a priority, creating the Coronary Heart Disease and Stroke Strategy in 2002.¹ The Scottish Stroke Care Audit (SSCA) was established in 2002 and now includes all hospitals managing acute stroke in Scotland. NHS Quality Improvement Scotland (NHSQIS) published the Clinical Standards for Stroke Services: Care of the Patient in the Acute Setting in March 2004², and carried out peer review visits across Scotland to assess performance against the standards between September 2004 and May 2005. Stroke services participating in the audit monitor their progress against the standards set by NHSQIS and those they have set for themselves in their own Quality Assessment Frameworks.

NHSQIS have updated and published reviewed standards in 2009, following the publication of SIGN 108³ which focuses on acute stroke care and secondary prevention. NHSQIS has also undertaken to review their standards after the ongoing update of SIGN 64⁴ which deals with rehabilitation and post stroke complications. The Scottish Government recently published their Action Plan for Heart Disease and Stroke⁵ which emphasises the importance of participating in the audit to measure performance against the standards and to monitor progress against the aims of the action plan.

1.1 Organisational structure of the Scottish Stroke Care Audit

There has been a major change to the central organisation of SSCA in 2009. The audit has joined the National Audit Programme at ISD (Information Services Division of National Services Scotland) and has benefited from additional resources. In addition, the audit now has its own Steering Group (rather than being part of the National Advisory Committee Stroke Audit and IT subgroup). The remit of the multidisciplinary SSCA Steering Group is to provide strategic direction and clinical input to the audit team, and to optimise the use of the data. See Appendix B for a full list of the members of the Steering Group.

The organisational structure has been augmented:

Professor Martin Dennis:	Chairman of the Steering Group
Hazel Dodds:	National Clinical Co-ordinator
Robin Flaig:	Quality Assurance Manager
Mike McDowall:	Audit Support/ IT Development
David Murphy:	Senior Information Analyst
Lee Barnsdale:	Principal Analyst with IT responsibility

Funding for SSCA for 2009/10 is £223,730. This includes a non-recurring payment to establish national connectivity and build the national database.

Audit staff are employed at each centre with funding made available through the CHD and Stroke Strategy. Typically, a medium or large acute hospital will have one audit co-ordinator with support from their MCN. In practice, staffing varies widely between hospitals. Audit co-ordinators' responsibilities include case ascertainment, data collection, completion of forms, data entry and provision of reports for both local and national use. Currently, local centres are responsible for the quality of their data and routine central validation of data will begin in 2009.

Ring fenced funding was provided by the CHD and Stroke Strategy from April 1st 2003 until March 31st 2008. The Scottish Government has ended ring fenced funding for local support of the audit, however, the funding has been included in each NHS boards' general allocation. Each NHS Board is expected to continue to collect the audit data. A review of local staffing and use of local funding will take place this year.

The information presented in this report highlights that there is variation in the quality of stroke services across Scotland.

1.2 This report

This year the report has been shortened. It includes, as in recent years, an Executive summary which will be distributed to NHS Board management teams. We have not included a detailed description of the aims and methods of the audit which have been included in previous reports and can be accessed at <http://www.strokeaudit.scot.nhs.uk/>. We have included data for 2007 and 2008 for Scotland overall and for each hospital. For the individual hospitals we have displayed these data as charts. The tables these charts are based on, with 95% confidence intervals and other related measures of performance, are available on the SSCA website (<http://www.strokeaudit.scot.nhs.uk>).

1.2.1 New NHSQIS Standards

The new NHSQIS standards express some levels of performance in a different way (see table) so our analyses have been adjusted so that hospitals can assess their performance against both the current and new versions of the NHS QIS standards.

Standard	Current standards 2004 - 2008	New standards 2009
Access to stroke unit services	70% enter stroke unit within 1 day of admission (Day 0 or 1)	60% on day 0 and 90% by day 1
CT scanning	80% within 2 days of admission (days 0,1 or 2)	80% on day of admission (day 0)
Swallow screening	100% on day of admission (day 0)	no change
Aspirin	100% of ischaemic strokes within 2 days of admission (days 0, 1 or 2)	100% of ischaemic strokes within 1 day of admission (days 0 or 1)
Delay from receipt of referral to neurovascular clinic	< 14 days	< 7 days

There are also two new standards which will require new data to be collected by SSCA. Stroke MCNs will monitor the use of thrombolysis for acute ischaemic stroke and will administer this according to current SIGN guidelines to at least five patients per 100 000 population each year. MCNs will also monitor the delay between arrival at the first hospital and administration of the bolus of recombinant plasminogen activator.

All patients with carotid artery territory TIA or ischaemic stroke who are candidates for carotid endarterectomy have carotid duplex (or other non-invasive imaging technique) unless there is a documented contraindication. And 80% of patients undergoing carotid endarterectomy for symptomatic carotid stenosis will have the operation within 14 days of the stroke event. The second is that 80% of carotid endarterectomies should be performed within 14 days of their last TIA or ischaemic stroke.

These standards focus on those parameters which have the best evidence for having an effect on patient outcomes e.g. stroke unit care, swallowing assessments, brain scanning, acute aspirin use, delays to assessments in neurovascular clinics and use of secondary prevention drugs.

2 Future Plans

As a part of the shift to the ISD Audit Group and the publication of a new Heart and Stroke Action Plan there will be significant changes to SSCA over the next year.

Reducing the burden of data collection:

The newly-formed SSCA Steering Group (Appendix B) met on 21st May 2009 for the first time. A review of the core dataset was circulated to all centres in September 2009. The new core dataset will be significantly reduced and will focus on key areas.

Reducing the delays in reporting:

In order to provide units with current, comparable national data, we will start prospective collection of data relating to the patients' first 24 hours in acute care. This will allow monthly reports to be distributed to the stroke teams at each hospital. These monthly reports will reflect activity for the previous month and will show how each unit is performing thus allowing clinicians to review processes of care, measure performance against targets and identify areas where further work is required. Clinicians can then plan to implement changes and will have the ability to monitor the outcomes of these changes in subsequent months.

Prospective data collection will be a challenge in some areas but the SSCA team will work with staff to help them achieve this from January 2010.

Creating a national database:

Work has already started in building a national database that will be populated by extracts from local units via secure electronic transmission of data from hospitals to ISD. This initiative will result in a more efficient and timely way of managing, analysing and reporting on stroke data. The database will facilitate the integration of information including different aspects of stroke care: pre-hospital care, thrombolysis, hyper-acute care, carotid intervention and long-term outcomes via linkage to Scottish Morbidity Record 01 (SMR01) and General Register Office for Scotland (GROS) databases. It will also offer an analytical resource to optimise the use of the data:

- Analysis of the whole patient journey
- Implementation of time-limited sprint audits
- Provision of information to support associated research projects
- Population-based publications in peer reviewed journals

The national audit will also be incorporating the requirements of three closely linked projects:

Scottish Hyperacute Stroke Activity Register and Evaluation (SHARE) under the leadership of Professor Peter Langhorne, begun in 2008. This addition to the audit will allow us to monitor the use of thrombolysis for ischaemic stroke in Scotland against the new NHSQIS Standards (see page 2, section 1.2.1).

Stroke Key Performance Indicators (KPIs) under the leadership of Dr Malcolm Alexander. This project will capture data routinely collected by the Scottish Ambulance Service (SAS) and NHS 24 and link it to the data currently collected through SSCAS. It will provide valuable information about delays and appropriateness of pre-hospital stroke care.

Scottish Carotid Intervention Project (SCIP) under the leadership of Mr Wesley Stuart. This project aims to build on previous audits of carotid interventions and will make use of routine data to monitor delays to surgery and also clinical outcomes such as perioperative stroke risk and deaths. In addition this data will be used to measure against the new NHSQIS Standards on Carotid Intervention (see page 2, section 1.2.1).

3 Inpatients

This year the Inpatient data are being divided between data collected during the acute phase of patient care and data collected on Discharge.

3.1 Summary and Key Findings relating to Inpatient Data

The Scotland wide data indicate that about 8,000 patients are hospitalised with stroke each year. Their mean length of stay is over 20 days so that these patients occupy almost a quarter of a million bed days. Interestingly, with 38 stroke units (acute, comprehensive and rehabilitation units) providing 768 beds this should be enough to accommodate all of the stroke patients admitted in a stroke unit. However, the report indicates that only 77% of stroke patients enter a stroke unit during their admission and only 57% are admitted on either the day of admission or the following day which does not meet the current NHSQIS standard of 70% of stroke patients should be admitted to a stroke unit within 1 day of admission. The new National Database should make detailed analysis of this much easier. This might elucidate whether problems are arising from inadequacies in the data such as underestimates of length of stay, inadequate provision of a particular type of bed or distribution of beds or whether this is simply a matter of bed management. See Chart 2 for a hospital breakdown of admission to stroke unit by day 0, 1 and 2 of admission.

Admission to a stroke unit is associated with a reduced risk of death and disability. In addition, earlier access to stroke unit care is probably key to improving performance in other aspects of care. Once patients are in a stroke unit environment then they usually receive the appropriate assessments and interventions. Clearly, NHS Boards and their Managed Clinical Networks (MCNs) need to do a lot of work to ensure that the new NHSQIS standard can be met, i.e. 60% admitted to a stroke unit on the day of admission and 90% by the following day. Their planning will need to take account of the day to day variation in numbers of stroke admissions and also the pressure placed on stroke unit beds by putting patients with other conditions in them simply to ensure that the 4 hour trolley wait target is met. Reassuringly, the proportion of a patients stay in hospital which is spent in a stroke unit is being maintained against pressures to move existing stroke patients out of a stroke unit bed to make way for another acute admission. The NHSQIS standard stipulates that stroke patients should remain in a stroke unit bed until they have completed their treatment.

There have been small but statistically significant improvements with respect to most measures of performance against NHSQIS standards. The greatest improvements have been in providing early assessments of swallowing (4% absolute improvement) and acute aspirin use (7% improvement). However, most hospitals fall far short of the NHSQIS standards for swallowing (100% on day of admission) and aspirin (100% within two days of admission). Chart 5 has a hospital breakdown by days 0, 1 and 2 for swallow screening and Chart 9 has the same breakdown for aspirin.

However, only the performance with respect to timing of brain scans exceeds the 2008 NHSQIS standard (80% within 2 days of admission) and it will fall well short of the revised one (80% scanned on the day of admission). Chart 7 presents the scanning data by hospital for days 0, 1 and 2. The Heart and Stroke Action Plan commits NHS Boards to work with their stroke MCNs to ensure that all NHSQIS stroke standards are exceeded by 2012.

Although, not covered by any specific NHSQIS standard the data indicate that the vast majority of patients are being discharged on appropriate treatment with aspirin and statins to reduce their future risks of stroke. Some consideration will be given to dropping these data from the

audit since there does not seem to be a significant problem in this aspect of care. There is still considerable variation in the proportion of patients who are discharged following an ischaemic stroke associated with atrial fibrillation who are prescribed warfarin. In part this may be because warfarin is being started after hospital discharge. To overcome this issue the audit will in future capture whether the hospital has recommended warfarin rather than necessarily having started it whilst the patient is in hospital.

3.2 Stroke Unit Information

Hospital Name	Admits acute stroke	Number of acute stroke discharged in 2008	No of stroke units	Acute Stroke Unit (ASU) beds	Combined ASU / Rehab Stroke Unit (RSU) beds	RSU beds on acute site	RSU beds off acute site	Number of Stroke bed days available per year	Mean Length of Stay (days)	Calculated no. Stroke bed days needed per year
Aberdeen Royal Infirmary	Yes	548	3	20	0	0	44	23,360	37.2	20,386
Dr Grays, Elgin	Yes	38	0	0	0	0	0	0	15.8	600
Ninewells Hospital	Yes	460	2	18	0	0	12	10,950	28.8	13,248
Perth Royal Infirmary	Yes	218	1	0	0	8	0	2,920	36.8	8,022
Royal Infirmary Edinburgh	Yes	379	3	22	0	0	54	27,740	41.4	15,691
St Johns Hospital	Yes	205	1	0	17	0	0	6,205	31.8	6,519
Western General Hospital	Yes	428	2	16	0	0	26	15,330	34.7	14,852
Royal Infirmary Glasgow	Yes	498	2	0	16	0	30	16,790	24.7	12,301
Stobhill Hospital	Yes	327	1	8	0	30	0	13,870	24.4	7,979
Western Infirmary Glasgow	Yes	588	2	14	0	0	30	16,060	21.2	12,466
Southern General Hospital	Yes	555	2	4	30	0	20	19,710	27.9	15,485
Inverclyde Royal Hospital	Yes	217	1	0	16	0	0	5,840	36.7	7,964
Royal Alexandra Hospital	Yes	218	1	0	30	0	0	10,950	26.1	5,690
Vale of Leven	Yes	83	0	0	0	0	0	0	45.4	3,768

Hospital Name	Admits acute stroke	Number of acute stroke discharged in 2008	No of stroke units	Acute Stroke Unit (ASU) beds	Combined ASU / Rehab Stroke Unit (RSU) beds	RSU beds on acute site	RSU beds off acute site	Number of Stroke bed days available per year	Mean Length of Stay (days)	Calculated no. Stroke bed days needed per year
Ayr Hospital	Yes	267	2	15	0	0	20	12,775	29.8	7,957
Crosshouse Hospital	Yes	388	2	21	0	20	0	14,965	25.4	9,855
Hairmyres Hospital	Yes	261	1	0	24	0	0	8,760	23	6,003
Monklands Hospital	Yes	285	1	0	24	0	0	8,760	12	3,420
Wishaw General Hospital	Yes	306	1	0	25	0	0	9,125	20	6,120
Forth Valley Hospital	Yes	533	2	15	0	0	30	16,425	28.5	15,191
Borders General Hospital	Yes	198	1	0	15	0	0	5,475	17.3	3,425
Dumfries & Galloway Royal Infirmary	Yes	232	1	10	0	0	0	3,650	29.1	6,751
Stranraer	Yes	17	0	0	0	0	0	0	18.6	316
Raigmore Hospital	Yes	314	1	0	22	0	0	8,030	25.2	7,913
Lorn & Islands	Yes	41	1	0	6	0	0	2,190	28.6	1,173
Belford Hospital	Yes	39	0	0	0	0	0	0	29.8	1,162
Caithness Hospital	Yes	72	0	0	4	0	0	1,460	20.6	1,483
Queen Margaret Hospital*	Yes	144	1	8	0	15	0	8,395	31.7	4,565
Victoria Hospital, Kirkcaldy*	Yes	187	1	0	23	0	0	8,395	32.1	6,003
Cameron Hospital	No	n/a	1	0	0	18	0	6,570	n/a	n/a
Orkney	Yes	23	0	0	0	0	0	0	50.0	1,150
Shetland	Yes	30	0	0	0	0	0	0	44.3	1,329
Western Isles	Yes	38	1	0	0	6	0	2,190	44.0	1,672
Totals		8137	38	171	252	97	266	286,890	28.3	230,459

* The number of acute strokes discharged in these hospitals is from 2007 and not 2008.

** These are hyperacute beds.

3.3 Scotland National Figures

Data from Dr Gray's, Elgin are not available for 2007. Data for Fife are not available for 2008 due to problems with staffing.

3.3.1 Admission

	2007	2008
Total number of Stroke patients	7986	7949
Total number of TIA patients	1017	1086
Total number of RAO patients	1	1
Total number of Transient monocular blindness patients	20	14
Total number of Possible cerebrovascular patients	169	159
No. of Stroke patients admitted (used as denominator unless otherwise specified)	7978	7943
Patients managed in a Stroke Unit		
Number	6144	6085
Percentage	77	77
Confidence Interval	76 to 78	76 to 78
Admitted to Any Stroke Unit on day of admission – including missing		
Number	2823	2764
Percentage	35	35
Confidence Interval	34 to 36	34 to 36
Admitted to a Stroke Unit within 1 day of admission – NHS QIS Standard		
Number	4466	4502
Percentage (NHS QIS)	56	57
Confidence Interval	55 to 57	56 to 58
Days from Admission to entry to Any Stroke Unit, for patients admitted into Stroke Unit >1 days after admission		
Mean	4.4	5.8
Minimum	2	2
Maximum	333	181
Denominator (excluding Missing)	1946	1577
Swallow screen during admission - including missing		
Number	4839	5045
Percentage	61	64
Confidence Interval	60 to 62	63 to 65
Swallow screen on day of admission – NHS QIS Standard		
Number	3352	3643
Percentage (NHS QIS)	42	46
Confidence Interval	41 to 43	45 to 47
Swallow screen within 1 day of admission, including missing		
Number	4323	4583
Percentage	54	58
Confidence Interval	53 to 55	57 to 59

	2007	2008
Scanned during admission - including missing		
Number	7701	7717
Denominator (excluding Missing)	7938	7850
Percentage	97	98
Confidence Interval	97 to 98	98 to 99
Scan on day of admission – including missing		
Number	3639	3277
Percentage	46	41
Confidence Interval	46 to 47	40 to 42
Scanned within 1 day of admission - including missing		
Number	5783	6301
Percentage	72	79
Confidence Interval	71 to 73	78 to 80
Scanned within 2 days admission – NHS QIS Standard		
Number	6908	7039
Percentage (NHS QIS)	87	89
Confidence Interval	86 to 87	88 to 89
No. Patients with Definite Ischaemic event		
	7652	7728
Received Aspirin in hospital - including missing		
Number	6378	6664
Percentage	83	86
Confidence Interval	83 to 84	85 to 87
Started Aspirin on day of admission – including missing		
Number	1862	2108
Percentage	24	27
Confidence Interval	23 to 25	26 to 28
Started Aspirin within 1 day of admission - including missing		
Number	4315	4900
Percentage	56	63
Confidence Interval	55 to 57	62 to 64
Started Aspirin within 2 days of admission – NHS QIS Standard		
Number	5271	5877
Percentage (NHS QIS)	69	76
Confidence Interval	68 to 70	75 to 77

3.3.2 Discharge

	2007	2008
No. of Stroke patients discharged/ died in hospital	7675	7806
Length of Stay in Hospital		
Mean	28.9	28.2
Minimum	0	0
Maximum	629	503
Denominator (excluding Missing)	7673	7799
Length of Stay in any Stroke Unit, for those with complete SU management information (includes Never in SU) - days		
Mean	22.5	21.8
Minimum	0	0
Maximum	627	426
Denominator (excluding Missing)	7607	7677
Percentage of Stay spent in Stroke Unit for patients recorded discharged (includes never in SU)		
Mean	69.3	67.7
Minimum	0	0
Maximum	100	100
Denominator (excluding Missing)	7594	7670
No. Patients with Definite Ischaemic event - Alive at Discharge	6549	6650
Discharged on Antiplatelet, Warfarin or a Trial - including missing		
Number	6098	6321
Percentage	93	95
Confidence Interval	93 to 94	95 to 96
Discharged on a Statin or a Trial - including missing		
Number	5352	5580
Percentage	82	84
Confidence Interval	81 to 83	83 to 85
No. Patients with Definite ischaemic event in AF - Alive at Discharge	1000	1160
Discharged on Warfarin or a Trial - including missing		
Number	507	442
Percentage	51	38
Confidence Interval	48 to 54	35 to 41
Discharged on Antiplatelet, Warfarin or a Trial - including missing		
Number	956	1010
Percentage	96	87
Confidence Interval	94 to 97	85 to 89

3.4 Hospital Data

Chart 1 Percentage of stroke patients admitted to a stroke unit within one day of admission (NHSQIS Standard = 70%)

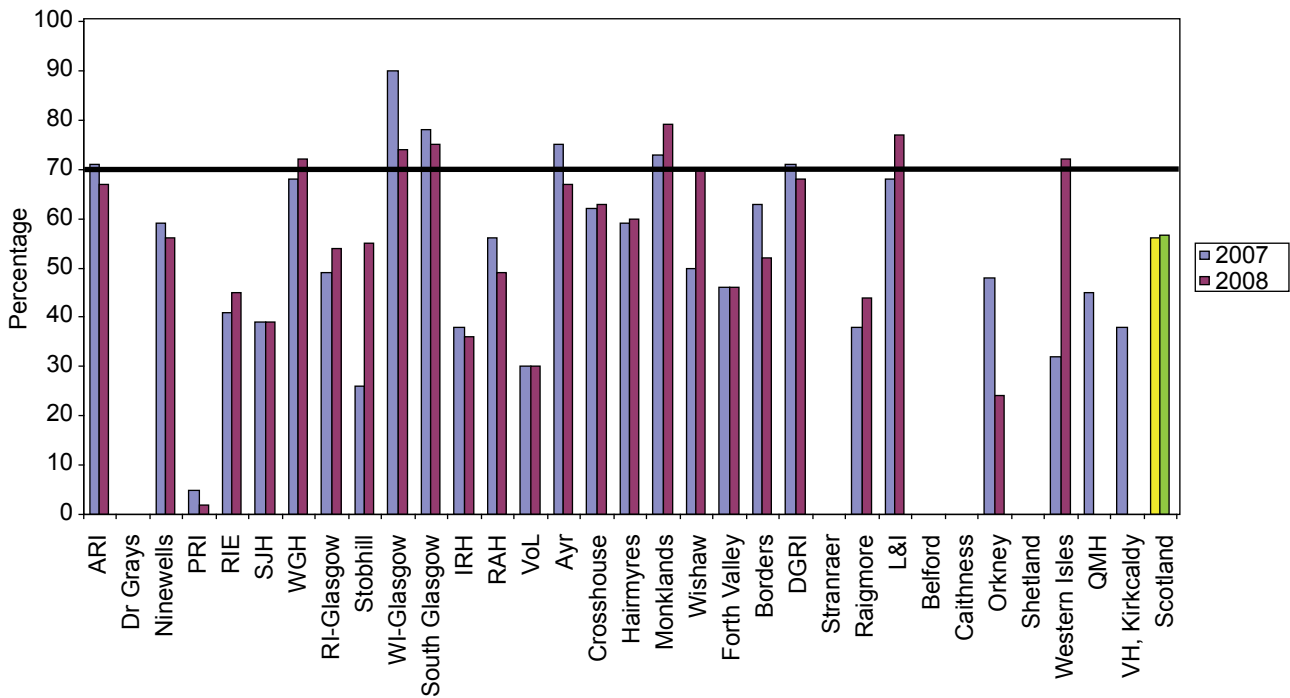


Chart 2 Percentage of stroke patients admitted to stroke unit by number of days to stroke unit admission, 2008 data

Horizontal lines reflect new NHSQIS standards (2009) to admit 60% on Day 0 and 90% by Day 1

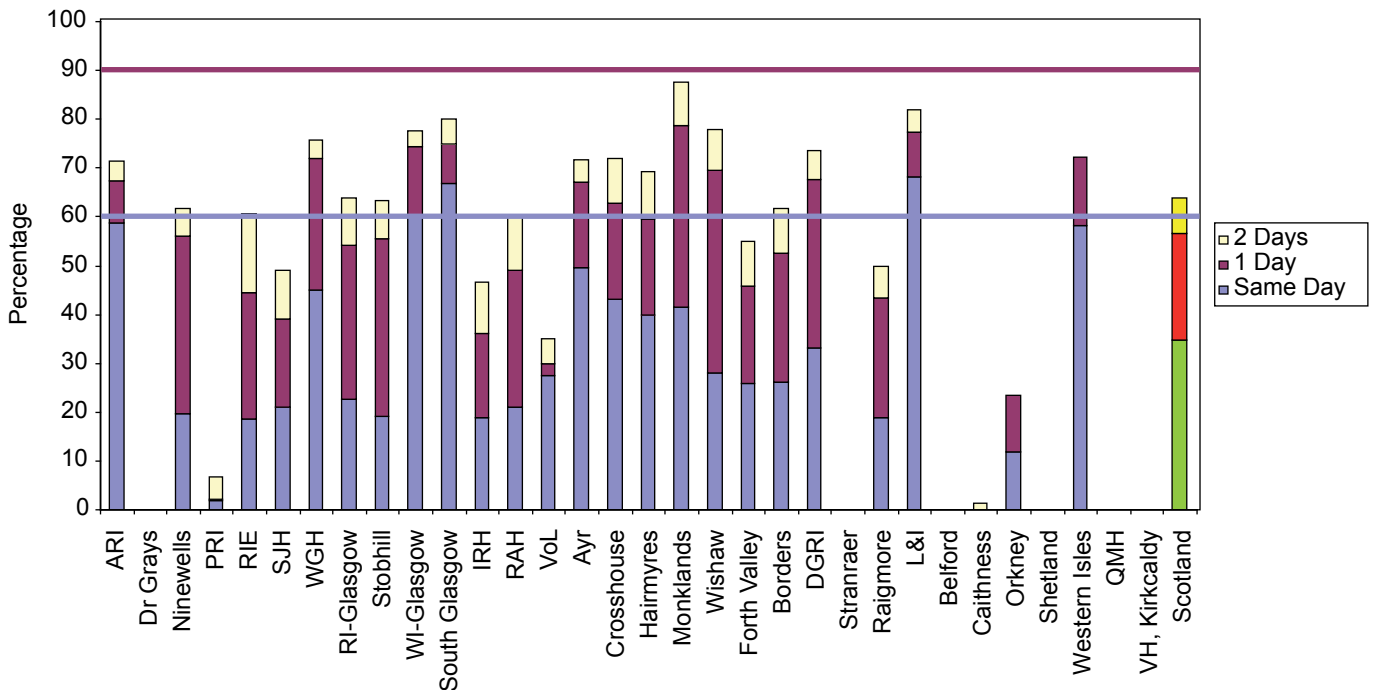
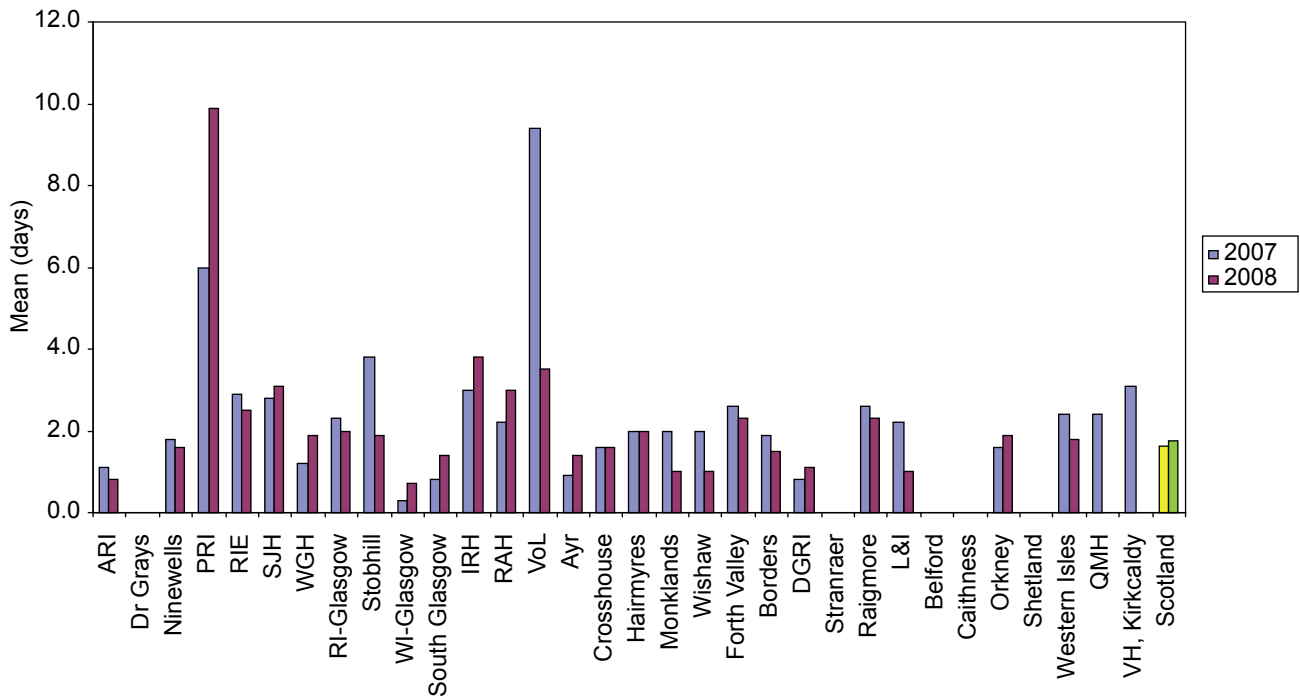
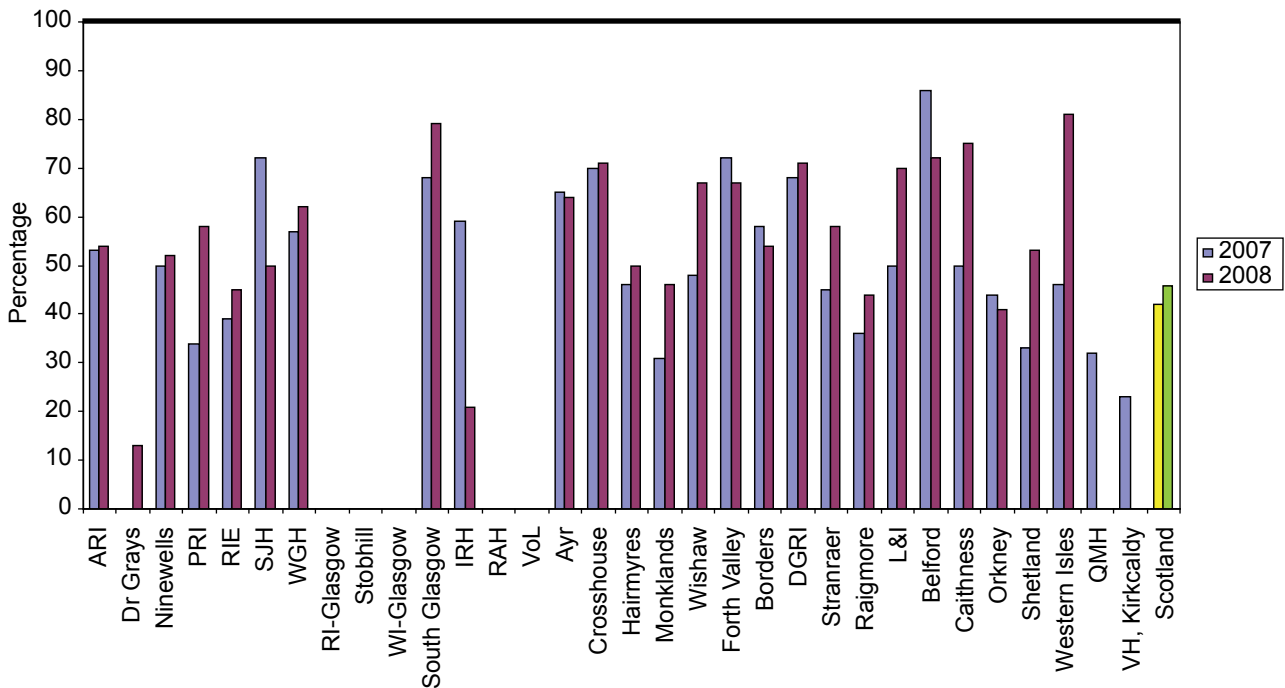


Chart 3 Mean delay (days) from admission to entry into any stroke unit



Those with a Mean of 0 do not have a stroke unit.

Chart 4 Percentage of stroke patients with a swallow screen on day of admission (NHSQIS Standard = 100%)



Data not collected at Royal Alexandra and Vale of Leven. Data are missing from Royal Infirmary-Glasgow, Stobhill and Western Infirmary-Glasgow due to a breakdown in data collection.

Chart 5 Percentage of stroke patients with a swallow screening by number of days to swallow screening, 2008 data

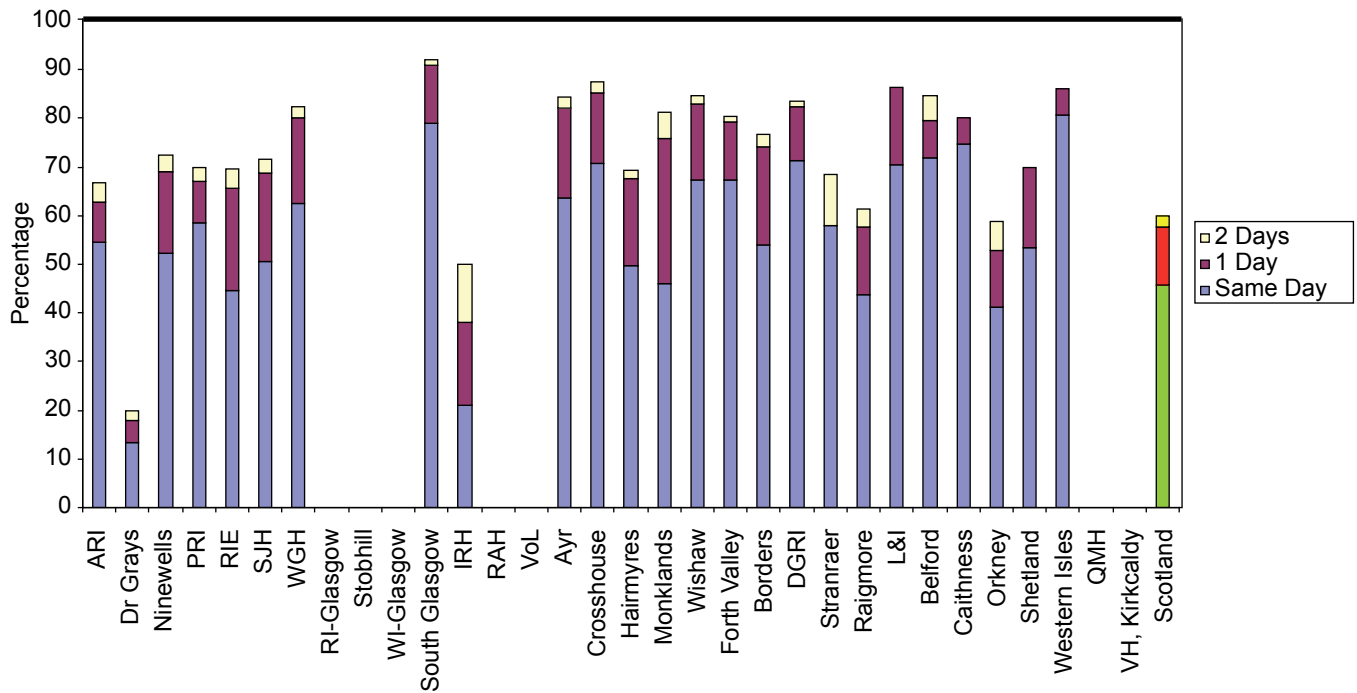


Chart 6 Percentage of stroke patients with a brain scan within 2 days of admission (NHSQIS Standard = 80%)

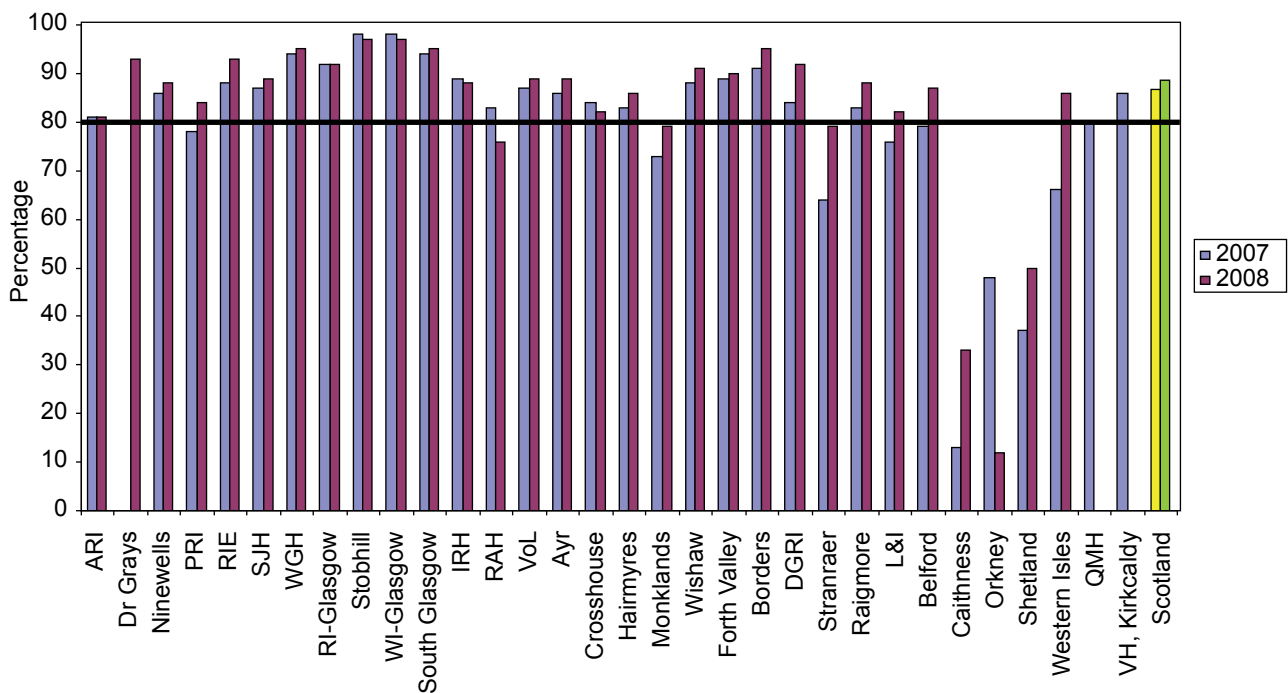


Chart 7 Percentage of stroke patients with a brain scan by number of days to scanning, 2008 data

Blue horizontal bar reflects new NHSQIS standard (2009) – 80% on day of admission

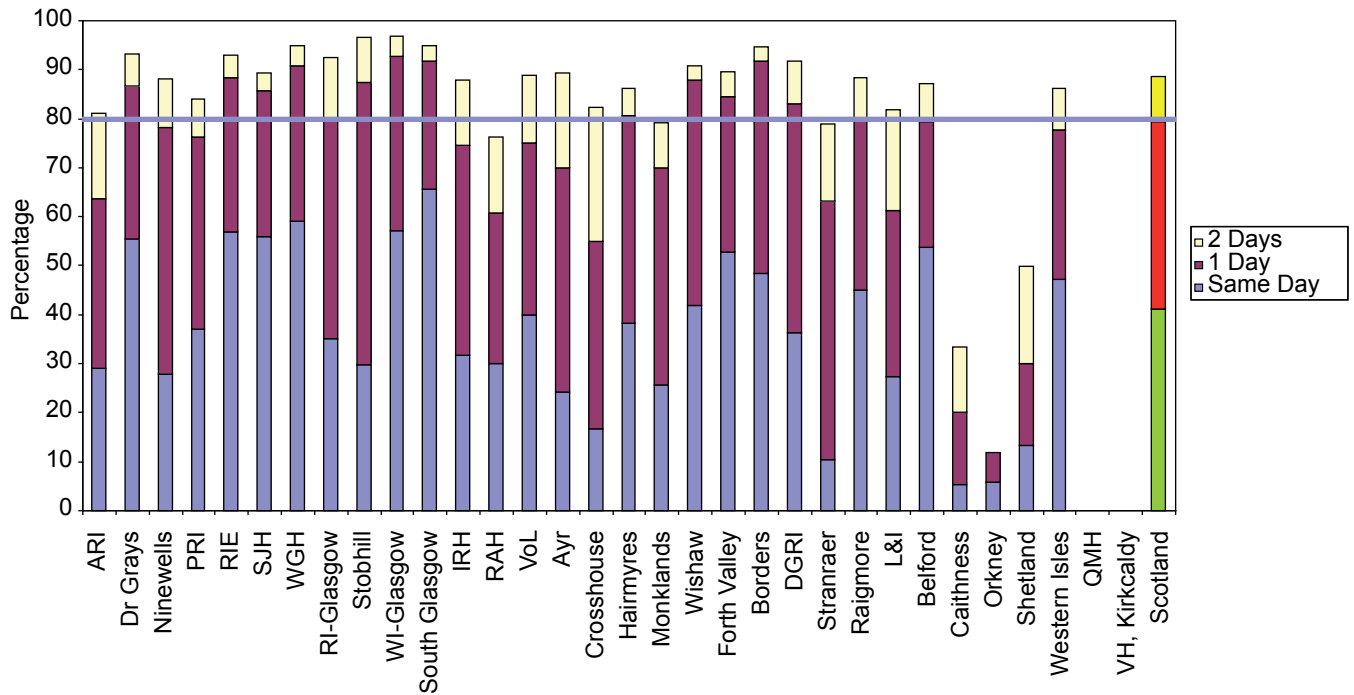


Chart 8 Percentage of ischaemic patients given Aspirin within 2 days of admission (NHSQIS Standard = 100%)

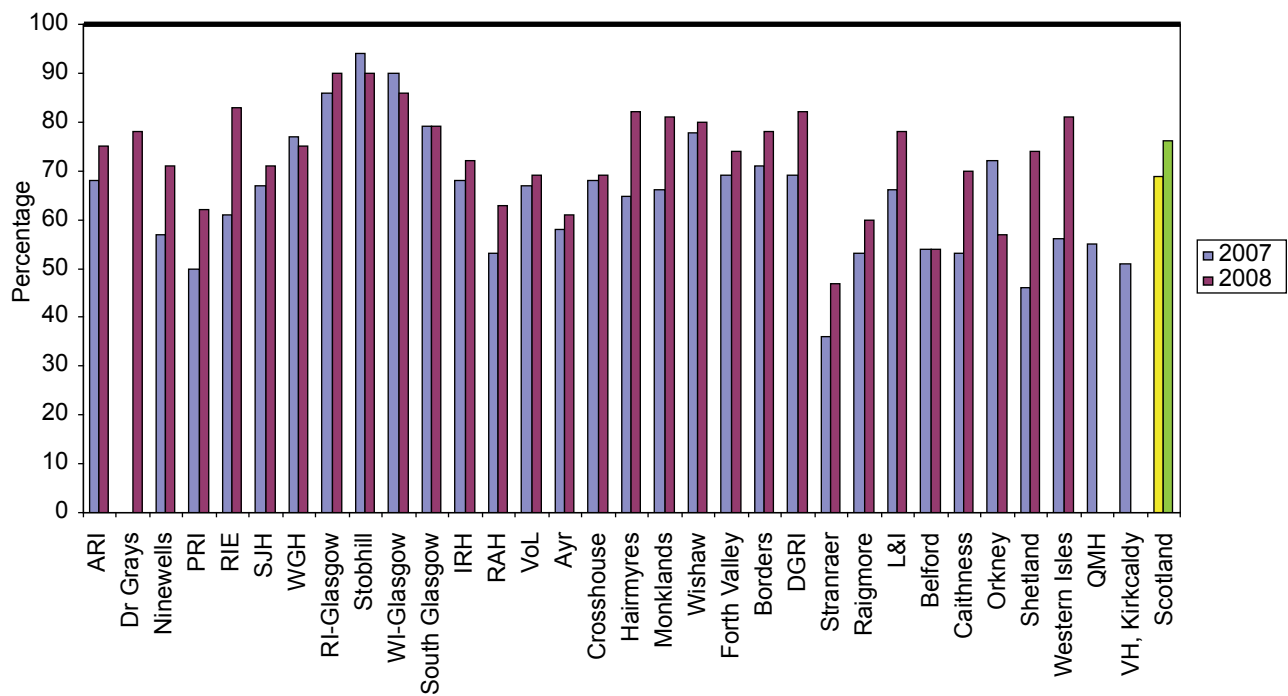


Chart 9 Percentage of ischaemic patients given Aspirin in hospital by number of days to receipt, 2008 data

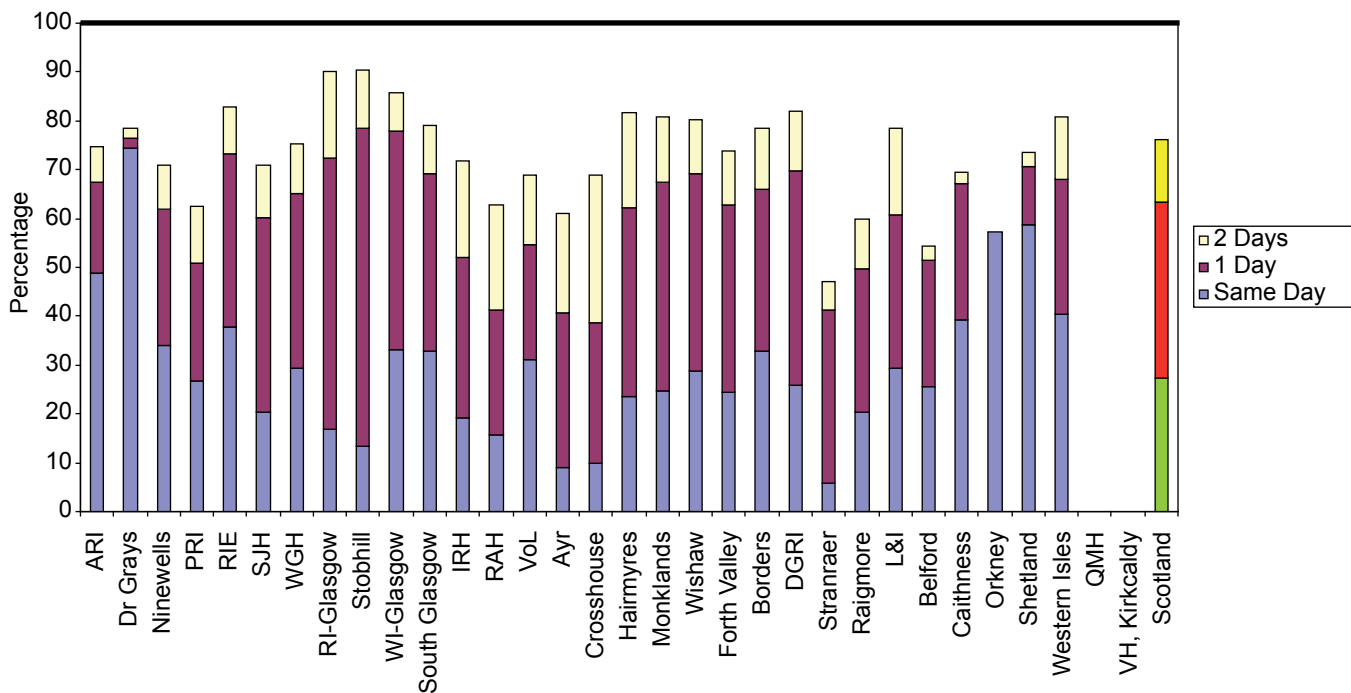


Chart 10 Percentage of ischaemic patients discharged on Antiplatelet, Warfarin or in a relevant trial

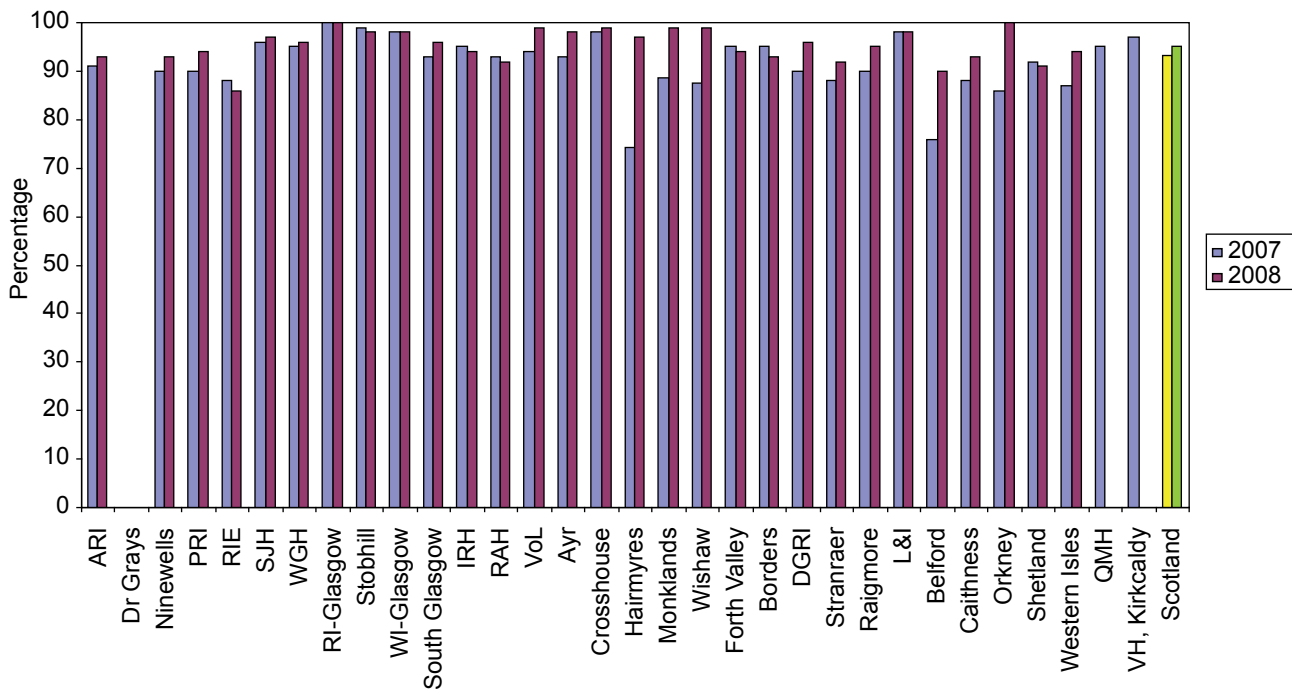


Chart 11 Percentage of ischaemic patients discharged on Statin or in a relevant trial

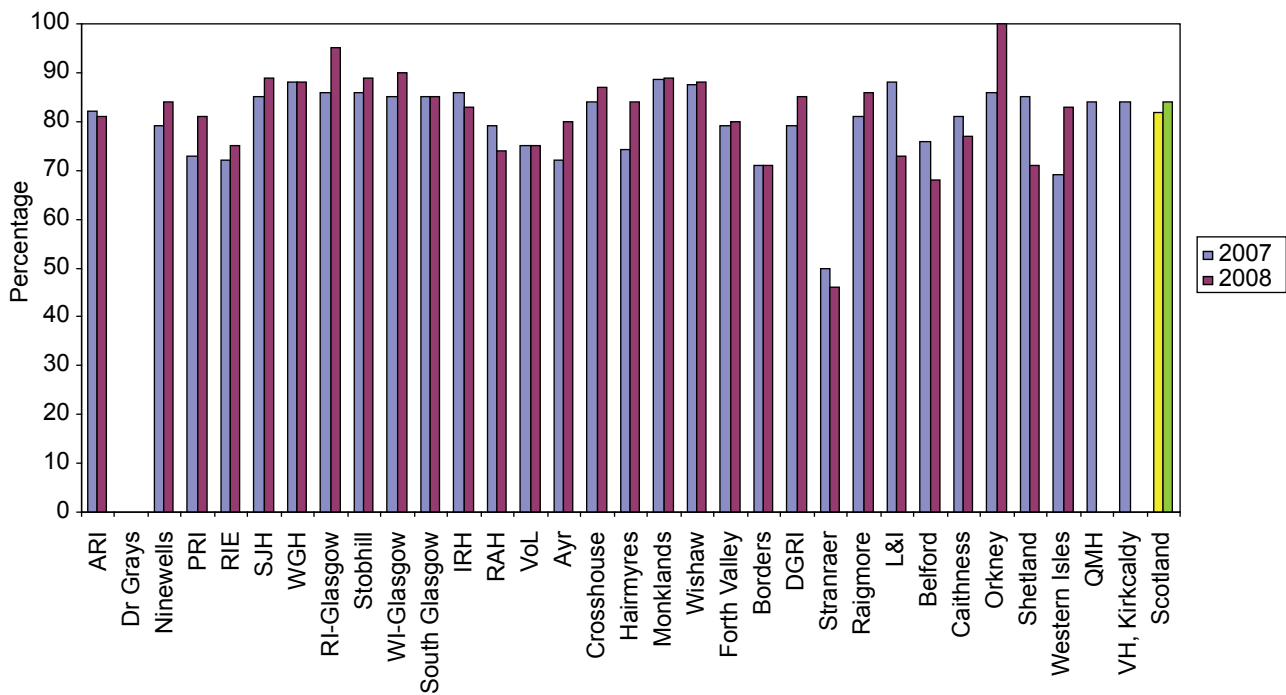
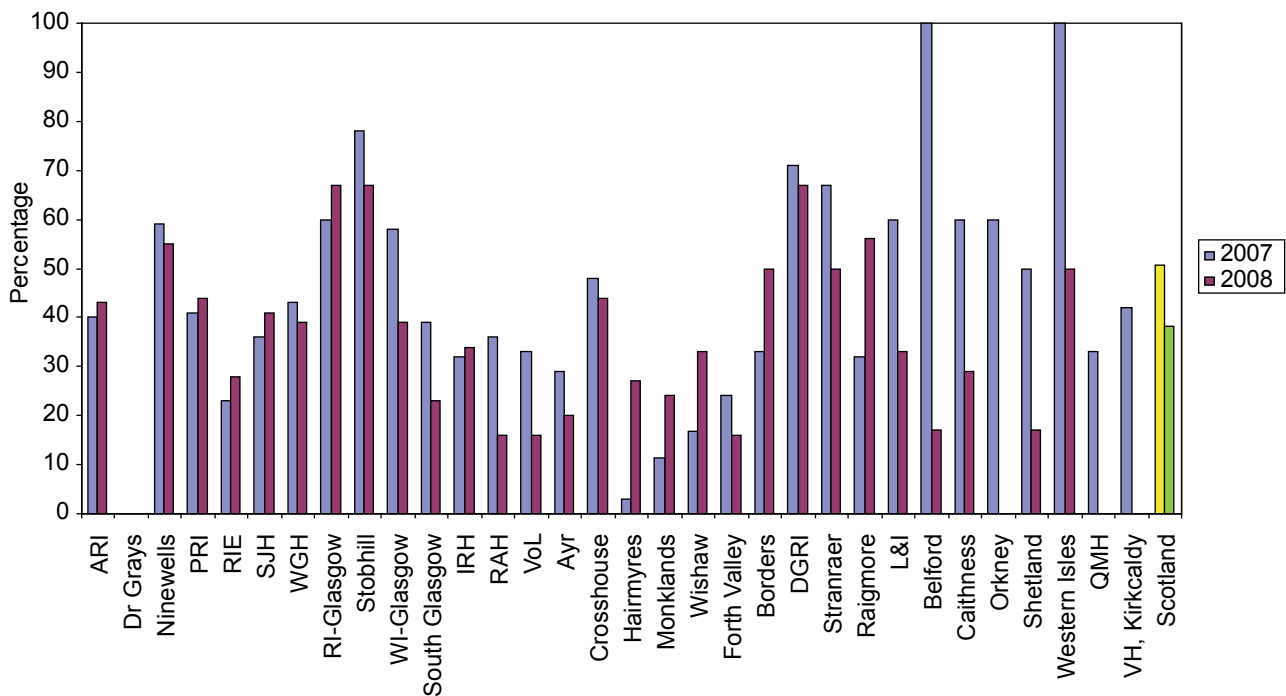


Chart 12 Percentage of ischaemic patients in AF discharged on Warfarin or in a relevant trial



4 Outpatients

4.1 Summary and Key Findings relating to Outpatient Data

A significant minority of hospitals offering neurovascular clinic services still do not collect comprehensive data to reflect their performance. The reorganisation of the audit (Section 2) will ensure that a Scotland wide picture can be presented in future reports.

Over 5,500 patients with acute cerebrovascular disease are seen in neurovascular clinics each year. There is on average a delay of more than a week between the patient's symptoms and their referral to a clinic. During this week those patients with cerebrovascular disease will have about a 10% chance of having a stroke. Thus any delay to starting effective treatment may result in an unnecessary stroke. These delays may occur at several points in the pathway:

- Patients may delay accessing medical services because of lack of awareness of the importance of their symptoms and/or lack of awareness of the most appropriate way of obtaining an urgent assessment. The aim of the ongoing public awareness campaigns being run by Chest, Heart and Stroke Scotland and the Stroke Association is to improve this situation.
- Patient may not be able to obtain an urgent appointment with their GP.
- GPs may not be able to obtain an urgent appointment in the local neurovascular clinic. There has been a reduction in the length of mean delay (3.1 to 2.2 days) between referral and the hospital receiving the referral from the GP which probably reflects increasing use of electronic referrals. There has also been a welcome reduction in the delay from receipt of referral to patients being seen in the neurovascular clinic with an absolute rise between 2007 and 2008 of 19% and 21% seen within 7 and 14 days respectively. However, only about half the patients are seen within the new NHSQIS standard of 7 days.

Although half the patients attending a neurovascular clinic can have their brain scan on the same day, and three quarters can have a carotid Doppler, there are still clinics where long delays to complete investigation are the norm. This can lead to delays in starting effective secondary prevention and will result in unnecessary strokes.

About 500 patients per year have a carotid endarterectomy following a TIA or minor ischaemic stroke each year. The operation is much more effective if performed early after the TIA or stroke so NHSQIS has set a new standard of 80% of operations being performed within 14 days of the patient's last symptoms. Although delays (where they are being monitored) have reduced over recent years the mean delay is still 46 days in Scotland. These long delays are clearly unacceptable and NHS Boards and MCNs have to seek ways to reduce them rapidly.

4.2 Scotland National Figures

Data for Centres with NHSQIS data only includes data from Fife for 2007 but not for 2008.

	Centres with complete Outpatient data			Centres with NHSQIS data only		
	2007	2008	Change	2007	2008	Change
Total Number of patients entered	3495	3660	+165	3795	3980	+185
Total number of Stroke patients	948	935	-13			
Total number of TIA patients	1127	1105	-22			
Total number of RAO patients	62	64	+2			
Total number of Transient monocular blindness patients	143	141	-2			
Total number of Possible cerebrovascular patients	333	342	+9			
Total number of non-cerebrovascular patients	904	1067	+163			
Total number of patients with No Recorded Diagnosis	19	37	+18			
No. of Definite cerebro-vascular diagnosis excluding SAH	2259	2232	-27	3632	3833	201
Days from last event to referral to NV clinic, excluding Negatives						
Mean	8.5	8.5	0			
Denominator (excluding Missing)	1866	1909	+43			
Patients with Days from last event to referral to NV clinic <= 7 days						
Number	1494	1528	+34			
Denominator (excluding missing)	2259	2232	-27			
Percentage	66	68	+2			
Confidence Interval	64 to 68	67 to 70				
Days from referral to receipt of referral						
Mean	3.1	2.2	-0.9			
Denominator (excluding Missing)	2194	2194	0			
Days from receipt of referral to examination excluding Negatives						
Mean	10.8	7.4	-3.4			
Denominator (excluding Missing)	2197	2196	-1			
Patients with Days from receipt of referral to examination <= 0 days - including missing						
Number	191	80	-111			
Percentage	8	4	-4			
Confidence Interval	7 to 10	3 to 4				
Patients with Days from receipt of referral to examination <= 1 days						
Number	285	399	+114			
Percentage	13	18	+5			
Confidence Interval	11 to 14	16 to 20				
Patients with Days from receipt of referral to examination <= 2 days - including missing						
Number	412	598	+186			
Percentage	18	27	+9			
Confidence Interval	17 to 20	25 to 29				
Patients with Days from receipt of referral to examination <= 3 days - including missing						
Number	591	810	+219			
Percentage	26	36	+10			
Confidence Interval	24 to 28	34 to 38				
Patients with Days from receipt of referral to examination <= 7 days - NHSQIS						
Number	1275	1552	+277	1309	2028	+719
Percentage (NHSQIS)	56	70	+14	36	53	+17
Confidence Interval	55 to 59	68 to 71		35 to 38	51 to 55	
Patients with Days from receipt of referral to examination <= 14 days - NHSQIS						

	Centres with complete Outpatient data			Centres with NHSQIS data only		
	2007	2008	Change	2007	2008	Change
Number	1725	1935	+210	2089	2983	+894
Percentage (NHSQIS)	76	87	+11	58	78	+20
Confidence Interval	75 to 78	85 to 88		56 to 59	77 to 79	
Brain Scan						
Number	1578	1640	+62			
Denominator (excluding missing)	2259	2232	-27			
Percentage	70	73	+3			
Confidence Interval	68 to 71	72 to 75				
Days from examination to Scan excluding Negatives, for Scan done and dates recorded						
Mean	4.0	4.3	+0.3			
Denominator (excluding Missing)	1355	1422	+67			
Patients with Days from examination to Scan <= 0 days						
Number	1229	1215	-14			
Denominator (excluding missing)	2259	2232	-27			
Percentage	54	54	0			
Confidence Interval	52 to 57	52 to 57				
Days from examination to Scan, for scans done after date of examination						
Mean	17.8	16.9	-0.9			
Minimum	1	1	0			
Maximum	180	132	-48			
Denominator (excluding Missing)	306	362	+56			
Days from examination to 1st Carotid Duplex excluding Negatives, for Doppler done and dates recorded						
Mean	2.3	2.2	-0.1			
Denominator (excluding Missing)	1848	1760	-88			
Patients with Days from examination to 1st Carotid Duplex <= 0 days						
Number	1752	1626	-126			
Denominator (excluding missing)	2259	2232	-27			
Percentage	78	73	-5			
Confidence Interval	76 to 79	71 to 75				
Days from examination to 1st Carotid Duplex, for Doppler done after date of examination						
Mean	16.4	15.4	-1.0			
Minimum	1	1	0			
Maximum	132	84	-48			
Denominator (excluding Missing)	255	255	0			

Data on patients referred from Neurovascular Clinic for Carotid Intervention.

	2007	2008	Change
Days from examination to referral to surgeon, for those referred to Surgeon and dates recorded			
Mean	6.5	6.0	-0.5
Denominator (excluding Missing)	125	99	-26
Days from referral to seen by surgeon, for those seen by Surgeon and dates recorded			
Mean	12.0	11.2	-0.8
Denominator (excluding Missing)	121	95	-26
Had Carotid Surgery – including missing			
Number	124	95	-29
Denominator	129	98	-31
Percentage	96	97	+1
Confidence Interval	91 to 99	91 to 99	
Days from seen by surgeon to surgery, for had Surgery and dates recorded			
Mean	23.2	16.3	-6.9
Minimum	0	0	0
Maximum	163	129	-34
Denominator (excluding Missing)	117	92	-25
Days from last event to (Carotid) surgery, for had Surgery and dates recorded			
Mean	52.5	45.6	-6.9
Minimum	4	3	-1
Maximum	190	268	+78
Denominator (excluding Missing)	97	89	-8

4.3 Hospital Data

Chart 13 Mean (days) from receipt of referral to examination in neurovascular clinic

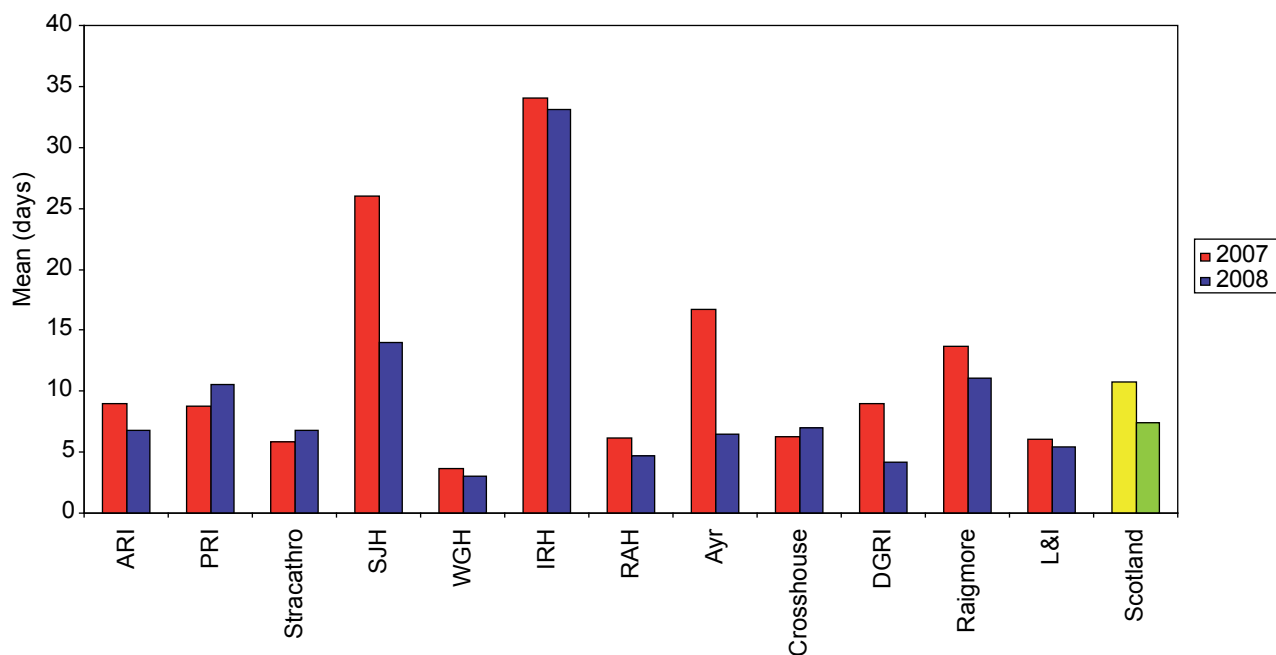


Chart 14 Percentage of patients with definite cerebrovascular diagnosis seen in neurovascular clinic with referral to examination time (days): same day and within 1, 2 and 3 days, 2008 data

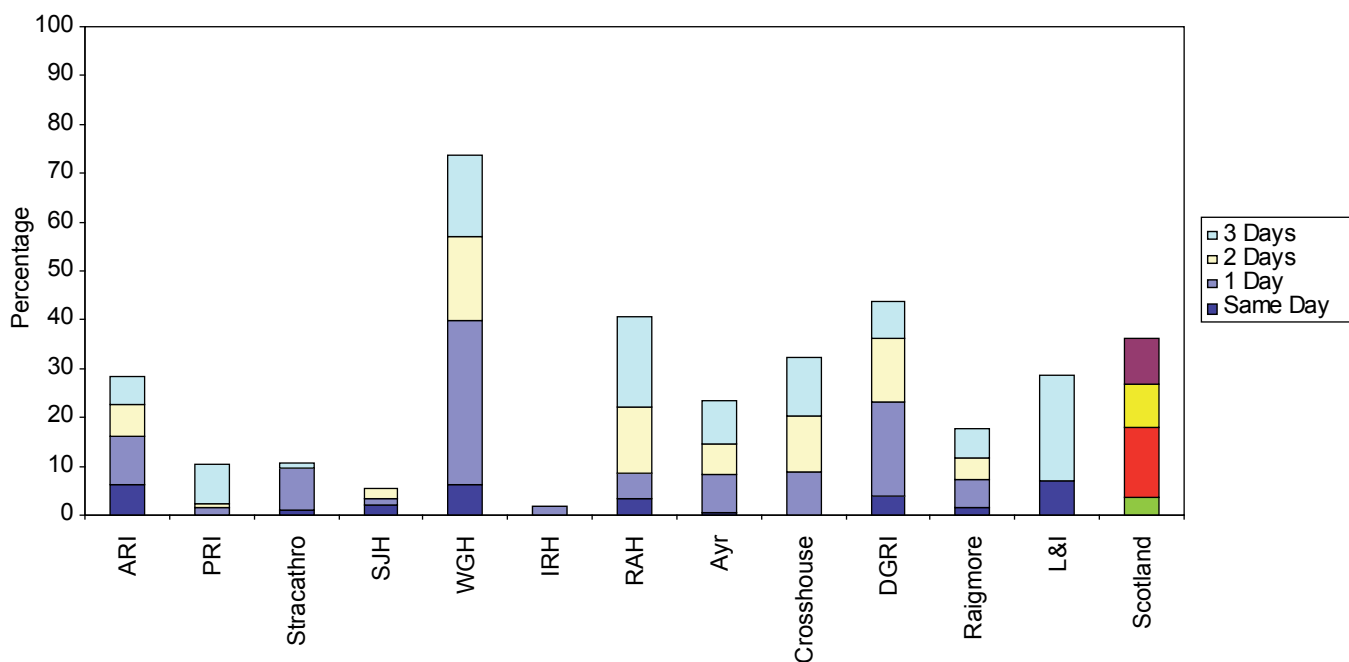


Chart 15 Percentage of patients with days from receipt of referral to examination in neurovascular clinic within 7 days (NHSQIS Standard = 80%)

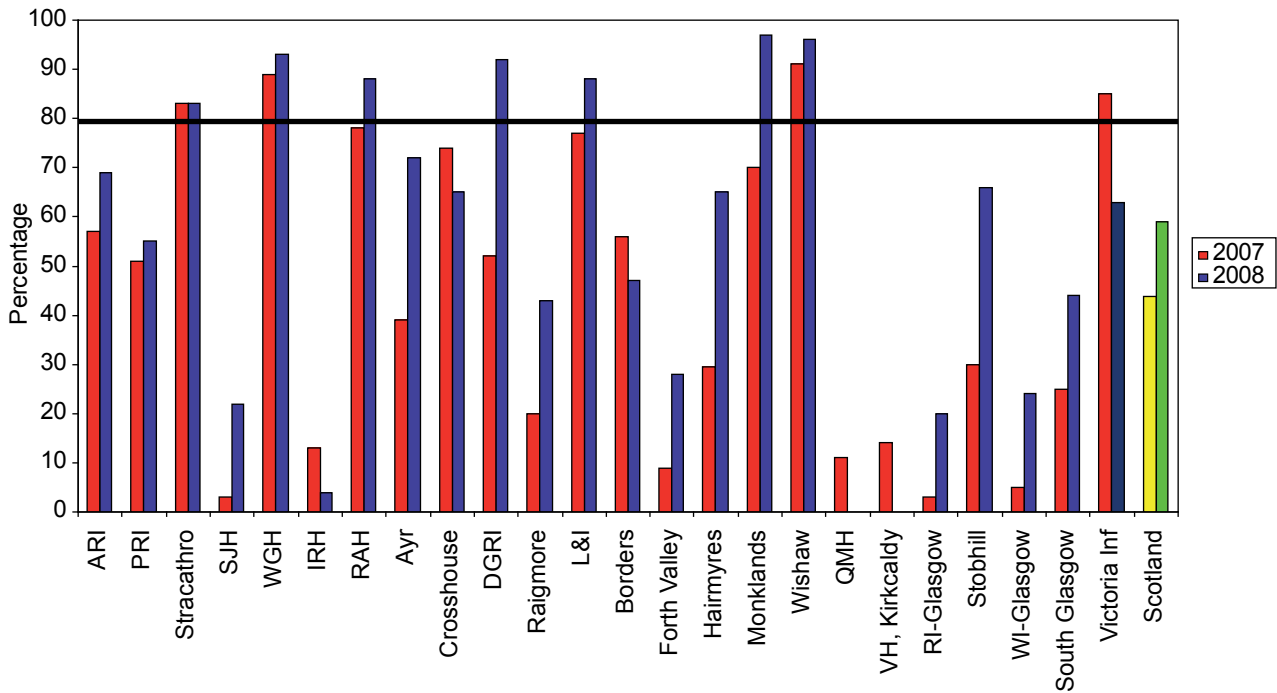


Chart 16 Percentage of patients with days from receipt of referral to examination in neurovascular clinic within 14 days (NHSQIS Standard = 80%)

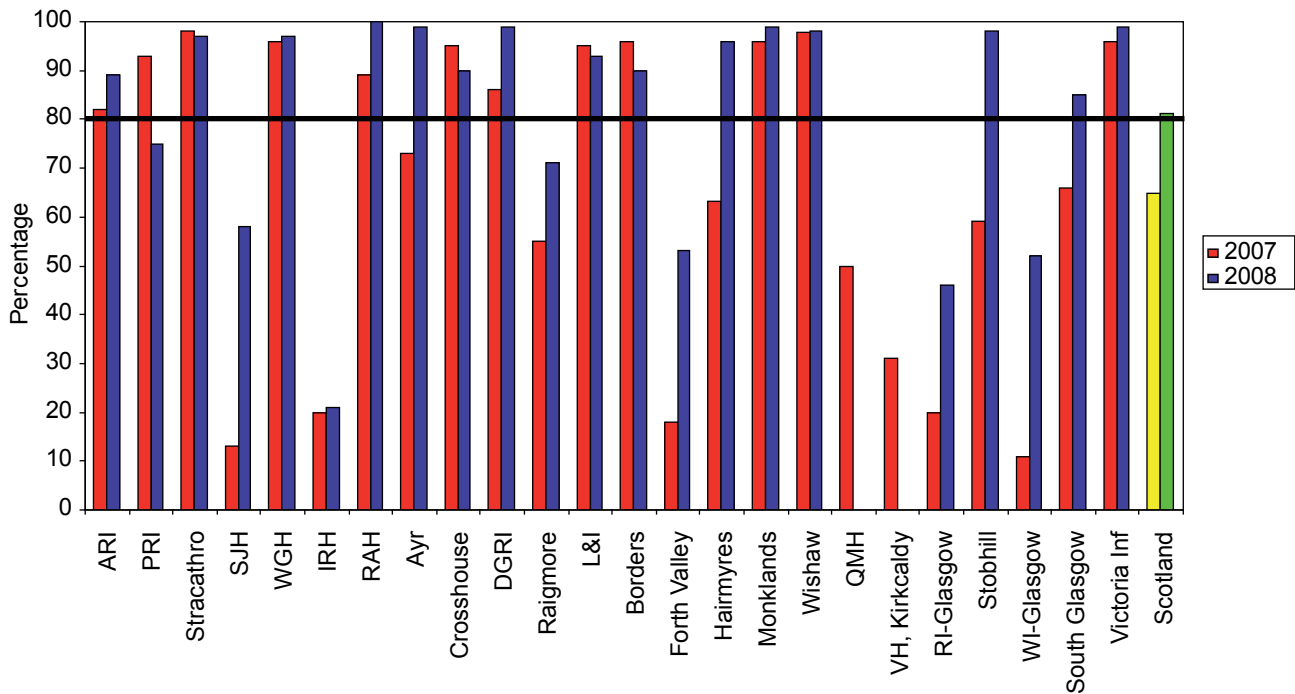


Chart 17 Percentage of patients with definite cerebrovascular diagnosis with referral to examination in neurovascular clinic time (days) within 7 and 14 days, 2008 data

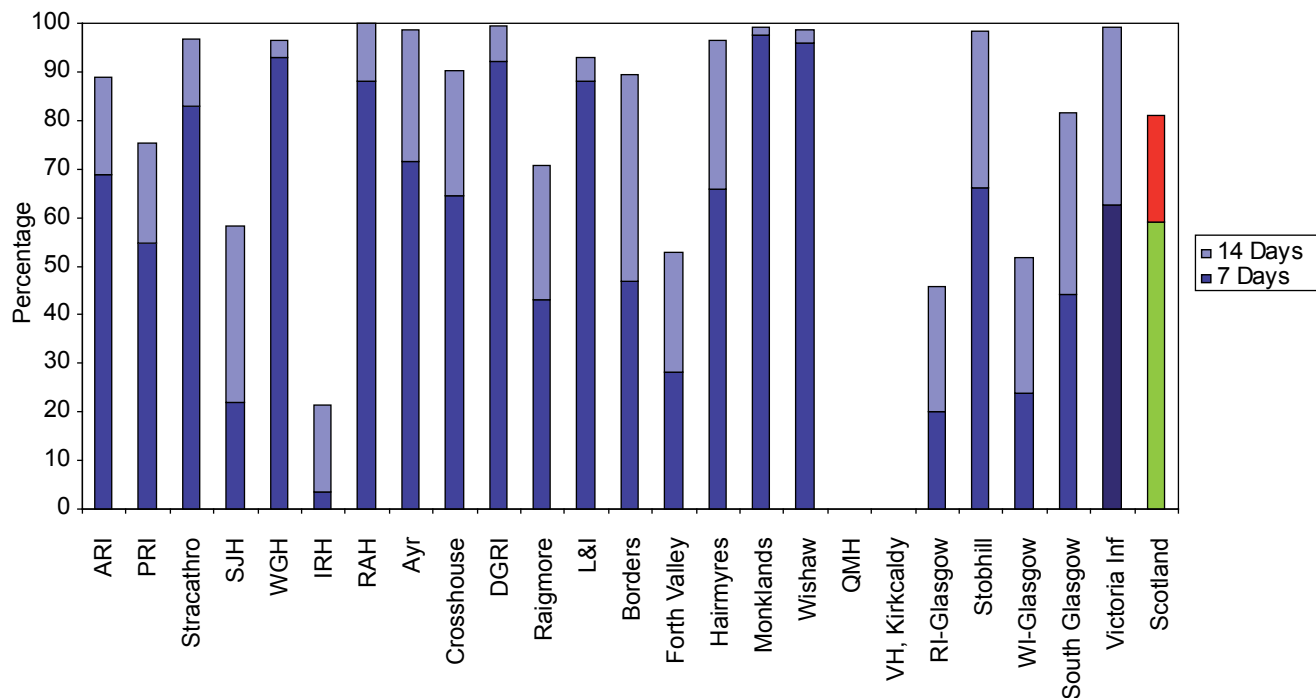


Chart 18 Mean (days) from examination in neurovascular clinic to 1st carotid duplex

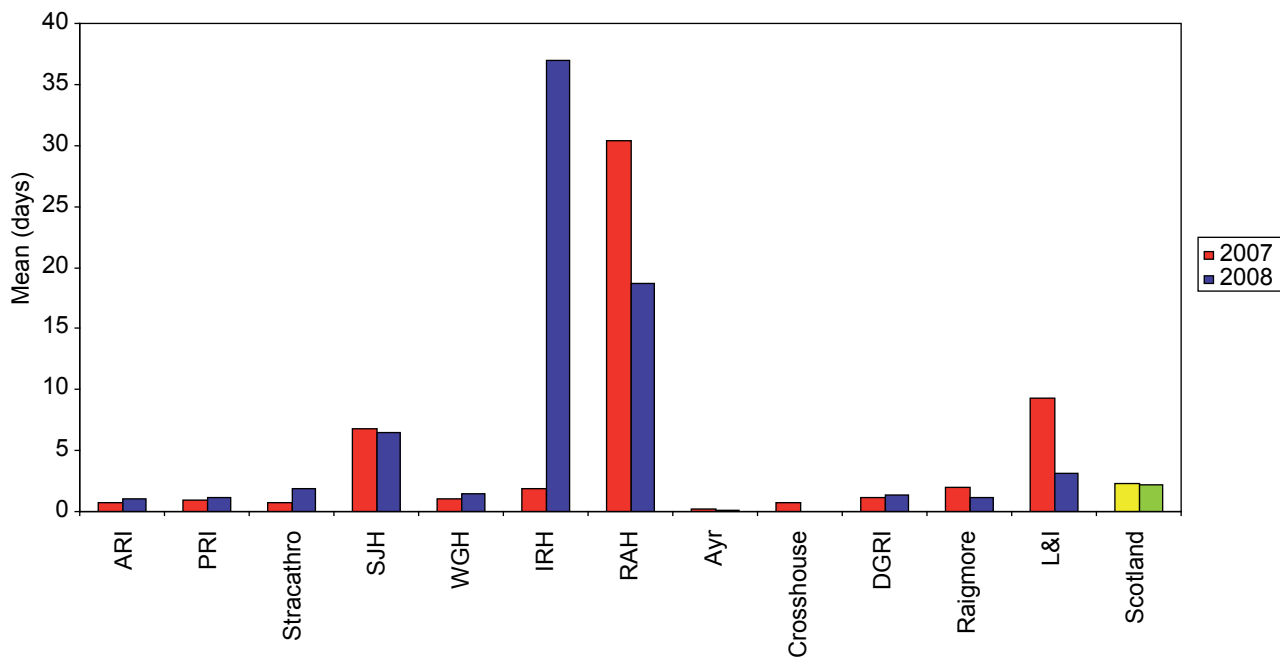
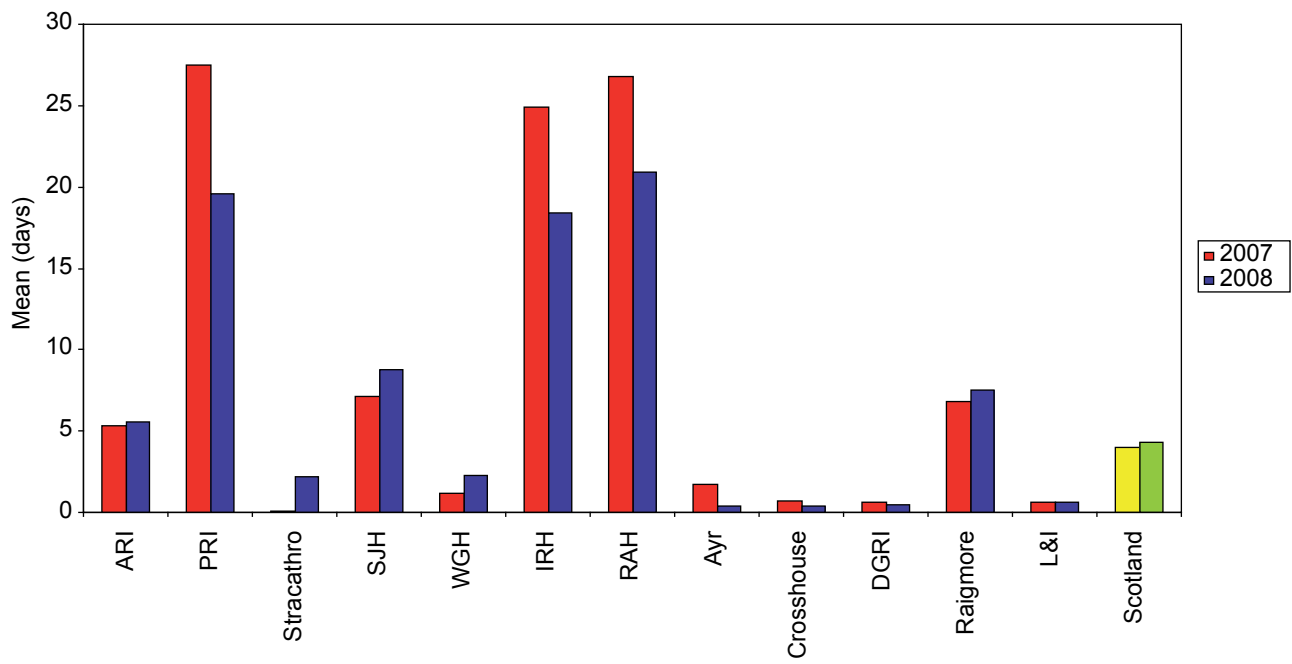


Chart 19 Mean days from examination in neurovascular clinic to brain scan, for scan done



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3. Scottish Intercollegiate Guidelines Network (SIGN). Management of Patients with Stroke or TIA: Assessment, investigation, immediate management and secondary prevention. Edinburgh, Scotland: SIGN (No. 108); 2008.
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<http://www.sign.ac.uk/guidelines/published/#CHD>
5. The Scottish Government, Better Heart Disease and Stroke Care Action Plan. Edinburgh, Scotland: 2009.
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Appendix A Minimum Dataset Definitions

Field Name	Definition
Patient identifier (CHI)	<p>Community Health Index ('CHI') numbers are being introduced in Scotland, giving a patient a unique, national, reference number 'from the cradle to the grave'. We recommend using CHI numbers as patient reference numbers. Where CHI numbers are not immediately available users may use another number. When a CHI number becomes available, that can be used to replace the temporary number.</p> <p>Similar steps are being taken in other parts of the UK. In England, 'new NHS' numbers are being introduced to fulfil the same function as CHI numbers. These will be acceptable to the system which is designed to cope with patients from any origin required.</p>
Case reference	Current hospital (provider unit) case reference for patient.
Surname	From the COPPISH SMR Data Manual version 1.1; issued November 1995 p2-5: "The surname of a person represents that part of the name of a person which indicates the family group of which the person is part."
Forename	<p>From the COPPISH SMR Data Manual version 1.1; issued November 1995 p2-6: "The first forename of a person represents that part of the name of a person which, after the surname, is the principal identifier of a person."</p> <p>When recording names be aware of different conventions for order for parts of the name used in different cultures.</p>
Sex	Male or Female
Date of birth	Date the patient was born
Date and Time of Initial assessment	Date and time of clinical examination from which baseline data for the system has been (mainly) drawn.
Responsible clinician	This should be the consultant under whose care the patient was at the time of hospital discharge.
Unit where seen	Identity of hospital or other provider unit where the patient was assessed.
Seen as	<p>In what context was the patient seen when initially examined. This can be in a hospital as either an Inpatient or as an Outpatient. It could also be at a GP clinic, at home (normal place of residence) or at some other place away from a hospital.</p> <p>Never seen as an Outpatient should be used where a patient has been referred for an event or events, but has never been seen in relation to that event or events. Thus it can be used even if a patient has been seen for a separate event or events. This code is intended to allow a Unit to audit the number of referrals received, including those where the patient is never seen.</p>

Field Name	Definition
Date and Time of Admission	<p>This should refer to date and time of arrival at the hospital rather than the date when the decision to admit was made or the date when the patient actually entered the ward. It is likely to be recorded in the Accident & Emergency department.</p> <p>If the event concerned occurred when the patient was already in hospital for another condition, the date of the original admission should be given. Dates of admission prior to event can easily be identified at analysis.</p>
Admitted from	Type of facility admitted from. Coded as per COPPISH codes.
Discharge date	Date discharged from hospital (alive) if relevant.
Discharged to	<p>Type of facility Discharged to. Coded as per COPPISH codes.</p> <p>The patient's place of residence is required. For instance, patients taken ill in the street should be coded as "admitted from home". COPPISH codes have commonly been mis-applied here (1). Patients taken ill in the street have been incorrectly coded as "admitted from other". Where a patient has a stroke when they are already in hospital for another condition, code the patient's place of residence when originally admitted to hospital.</p>
Postcode sector	<p>Postcode sector is that part of the patient's postcode excluding the last two characters (the 'Unit') from their usual address. Strictly the sector as described here comprises Area, District and Sector (see http://www.ex.ac.uk/cimt/resource/postcode.htm). Storage of sector alone is not considered to compromise patient confidentiality as it is too imprecise to be used to identify individuals. The sector can be used to establish Deprivation scores in Scotland using the Carstairs index.</p>
Stroke	Whether final diagnosis included stroke. (Further details may be recorded in the Disease Classification section).
Transient ischaemic attack	Whether final diagnosis included Transient Ischaemic Attack. (Further details may be recorded in the Disease Classification section).
Sub-arachnoid haemorrhage	Whether final diagnosis included SubArachnoid Haemorrhage. (Further details may be recorded in the Disease Classification section).
Retinal artery occlusion	Whether final diagnosis included Retinal Artery Occlusion. (Further details may be recorded in the Disease Classification section).

Field Name	Definition
Transient monocular blindness	<p>Whether final diagnosis included Amaurosis Fugax. (Further details may be recorded in the Disease Classification section).</p> <p>Amaurosis Fugax refers to any episode of monocular visual loss (complete or partial) lasting less than 24 hours and which is presumed to be due to retinal ischaemia (not venous occlusions).</p> <p>Retinal venous occlusions should be coded as non-cerebrovascular disease.</p>
Possible cerebrovascular	<p>Whether final diagnosis included Possible cerebrovascular disease.</p> <p>Use if presentation could have cerebrovascular cause but < 50% certain and give details (e.g. lone vertigo).</p>
Possible cerebrovascular Details	<p>Whether final diagnosis included possible cerebrovascular diagnosis. Further details may be recorded in the text box alongside. In addition, the Disease Classification section can be set up to record specific details to suit your requirements.</p>
Definite non-cerebrovascular	<p>Whether final diagnosis included other, non-cerebrovascular diagnosis. Further details may be recorded in the text box alongside. In addition, the Disease Classification section can be set up to record specific details to suit your requirements.</p>
Definite non-cerebrovascular: Details	<p>When final diagnosis includes other, non-cerebrovascular diagnosis, further details may be recorded here.</p>
Date of Onset	<p>This is the best estimate of the date of onset of the patient's focal cerebral symptoms based on all available information. If patients do not have focal cerebral symptoms (e.g. just headache with subarachnoid or intracerebral haemorrhage) the onset of the predominant symptom should be recorded. If a patient has non-focal symptoms prior to development of focal cerebral symptoms or deficits do not code the date of onset of these as the date of stroke onset.</p>
Was the patient independent in ADL before event	<p>Patients should be independent (i.e. not need help from any person) in activities which would normally be performed everyday i.e. walking (at least around their house), washing, dressing, feeding (not meal preparation) and toileting.</p> <p>For the purposes of this classification we do not include activities which are carried out less frequently and where dependency is highly dependent on the environment (e.g. bathing vs showering, shopping depends on distance from shops, stairs depends on type of living accommodation). This will hopefully lead to better agreement than leaving it up to the individual rater to decide what 'everyday activities' means.</p>

Field Name	Definition
Was the patient living alone at the time of event	<p>If they are living away from their normal place of residence temporarily - e.g. on holiday or in hospital - please be sure to code their NORMAL place of residence, not their temporary place of residence.</p> <p>If the patient is living in a residential or nursing home they should not be coded as living alone. If they live alone in a warden controlled apartment then this can be coded as living alone.</p>
Can the patient talk	Is the patient able to talk? Should the patient be unassessable for any reason code 'NO' (abnormal).
Are they orientated in time, place and person	<p>Can the patient tell you their name, the place and time correctly (Y or N)?</p> <p>This question is based on the verbal component of the Glasgow Coma Scale, where:</p> <p>5 = orientated 4 = confused 3 = inappropriate words 2 = groans 1 = none</p> <p>If 5 record as 'Yes' (orientated), otherwise record as 'No' (including patients who are unassessable for any reason).</p>
Can the patient lift both arms off the bed	<p>We do not stipulate that they should be able to keep them off the bed for any specific period or lift them to the horizontal.</p> <p>Should the patient be unassessable for any reason code 'NO' (abnormal). Should the unaffected arm be completely missing, code the affected arm only. Should the affected arm be completely missing, code on the affected leg instead, if possible, otherwise code 'NO'.</p>
Able to walk without help from another person	Is the patient able to walk without the aid of another person (Y or N)? They may use any other aid.
Current AF confirmed on ECG	Refers to atrial fibrillation (AF) which is proven on an ECG at the time of assessment or during any hospital inpatient stay. Please also include AF proven on ECG at any time between the event for which they are being assessed and the current assessment. It should not include atrial flutter for which there is less robust evidence for the effectiveness of anticoagulation in stroke prevention.
Aspirin at onset	Had the patient taken aspirin in the 24 hours prior to the onset of stroke symptoms?
On Warfarin at onset	Whether the patient had been prescribed Warfarin prior to and at the time of first symptoms. This is a question related to patient management, please ignore complications relating to compliance.

Field Name	Definition
Was the patient managed in an acute Stroke Unit	An acute stroke unit is defined as a specific ward or part of a ward where patients with acute stroke are admitted either directly from the community, from the accident & emergency department or after a brief (usually <24 hours) stay in a medical assessment area.
Entry to acute Stroke Unit	Date of entry to acute Stroke Unit, from any source - e.g. acute receiving unit or from another ward or hospital.
Exit from acute Stroke Unit	Date when patient moves out of acute stroke unit whether it is to home or another ward or hospital.
Unit	Identity of hospital or other provider unit containing the acute Stroke Unit.
Consultant	This should be the consultant under whose care the patient was while in this unit.
Was the patient managed in a rehab Stroke Unit	A stroke rehabilitation unit is a ward or part of a ward which is designated specifically for the rehabilitation of patients with stroke and in which the majority of patients will have had a stroke. Multidisciplinary team meetings should take place at least weekly and the staff will have received specific training in stroke.
Entry to rehab Stroke Unit	Date of entry to rehab unit, from any source - e.g. stroke unit or from another ward or hospital.
Exit from rehab Stroke Unit	Date when patient moves out of stroke rehabilitation unit whether it is to home or another ward or hospital.
Unit	Identity of hospital or other provider unit containing the Rehabilitation Stroke Unit.
Consultant	This should be the consultant under whose care the patient was while in this unit.
Was the patient managed in a rehab unit	A normal rehabilitation unit is a ward or part of a ward which is designated specifically for the rehabilitation of patients with no particular emphasis on any disease or condition.
Entry date	Date of entry to rehab unit, from any source - e.g. stroke unit or from another ward or hospital.
Exit date	Date when patient moves out of rehabilitation unit whether it is to home or another ward or hospital.
Unit	Identity of hospital or other provider unit containing Rehabilitation Unit.
Consultant	This should be the consultant under whose care the patient was while in this unit.

Field Name	Definition
Whether Aspirin given in hospital	<p>This should be completed by reference to the drug chart.</p> <p>A patient may have been using aspirin but this is stopped on / immediately after admission for any reason, e.g. pending results of CT or other tests.</p> <p>In these circumstances, ignore this use of aspirin when considering how to answer this question. If aspirin is restarted, answer Yes, and enter the date restarted as date started. If not restarted, enter No.</p> <p>If a patient has been using aspirin and this is continued without break, enter Yes, with the date of admission as the date started.</p> <p>If a patient is never given aspirin answer No. If newly prescribed aspirin, enter Yes with the date started.</p> <p>If the patient is being audited for a stroke that occurred when they were already in hospital, only that period after their stroke should be considered. In other words, the time of stroke should be treated as the time of admission to hospital when considering how to answer this question.</p>
Date Aspirin started	<p>Date aspirin first given after hospital admission or after the stroke onset if stroke occurred in hospital. This should be completed by reference to the drug chart.</p> <p>A patient may have been using aspirin but this is stopped on / immediately after admission for any reason, e.g. pending results of CT or other tests.</p> <p>In these circumstances, ignore this use of aspirin when considering how to answer this question. If aspirin is restarted, enter the date restarted as date started.</p> <p>If a patient has been using aspirin and this is continued without break, enter the date of admission (or onset if stroke occurred in hospital) as the date started.</p> <p>If newly prescribed aspirin, enter the date started</p>
Final Discharge from hospital on Aspirin	Did aspirin appear on the discharge prescription or list of drugs which the patient should have been taking after discharge.
Final Discharge on Clopidogrel (Plavix)	Did Clopidogrel (Plavix) appear on the discharge prescription or list of drugs which the patient should have been taking after discharge.
Final Discharge on Dipyridamole (Persantin)	Did Dipyridamole (Persantin/Asasantin) appear on the discharge prescription or list of drugs which the patient should have been taking after discharge.
Final Discharge on Warfarin	Did Warfarin appear on the discharge prescription or list of drugs which the patient should have been taking after discharge.

Field Name	Definition
Final Discharge on an ACE inhibitor	Did an ACE Inhibitor appear on the discharge prescription or list of drugs which the patient should have been taking after discharge.
Final Discharge on a Diuretic	Did a Diuretic appear on the discharge prescription or list of drugs which the patient should have been taking after discharge. Diuretic is defined as a drug given with the defined intention of increasing urine flow from the kidneys.
Final Discharge on another anti-hypertensive	Did another anti-hypertensive appear on the discharge prescription or list of drugs which the patient should have been taking after discharge.
Final Discharge on a Statin	Did a Statin appear on the discharge prescription or list of drugs which the patient should have been taking after discharge.
CT	Computerised tomography of the brain.
CT Date	Date of first CT after stroke onset.
MRI	Magnetic Resonance Imaging scan of the brain.
MRI Date	Date of first MRI after stroke onset.
Evidence of new haemorrhage on scan	Based on either review of actual scan or the radiologists report. Please include haemorrhage which is thought to be secondary to cerebral infarction i.e. haemorrhagic transformation of infarction. If there are only vague signs of possible petechial haemorrhage into an infarction it would be reasonable to code haemorrhage as being absent. In this field we are trying to establish whether there was a definite contra-indication to antithrombotic medication given and acknowledge the difficulties of distinguishing primary haemorrhage from that into an area of infarction.
Classification of Stroke Syndrome	This refers to the clinical syndrome at the time of maximal deficit. Coding should take account of the results of imaging where available.
ICD 10 final diagnosis	Pick the most appropriate and specific ICD 10 code from the list provided.
Swallow screen recorded	A two stage assessment aimed to establish first whether it is safe to proceed with a formal assessment of swallowing safety and second to determine, using a simple water swallow test, whether the patient can safely be given free oral fluids and food. Failure on either part should lead to the patient being put 'nil by mouth' and given at least hydration and sometimes nutrition via an alternative route until a formal assessment by a speech and language therapist. The fact that a screening test for swallowing problems has been carried out and its results, should be documented in the medical notes.
Swallow screen Date	Date first Swallowing assessment performed.

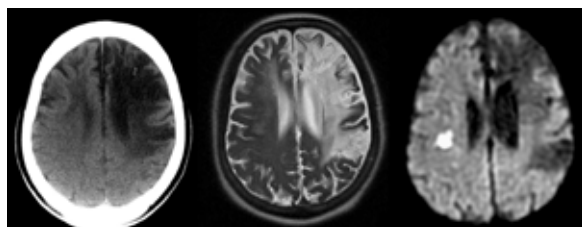
Appendix B Steering Committee

Name	Title	NHS Board/ Organisation
Malcolm Alexander	Associate Medical Director	NHS 24
Tracey Baird	Consultant Physician	NHS GG&C
Mark Barber	Consultant Geriatrician, MCN Clinical Lead	NHS Lanarkshire
Karen Barclay	Speech and Language Therapist	NHS Ayrshire and Arran
Lee Barnsdale	Principal Analyst	NSS (ISD)
Diana Beard	National Project Manager	NSS (ISD)
Katrina Brennan	Stroke MCN Manager	NHS Lanarkshire
Martin Dennis, Chair	Professor of Stroke Medicine, Consultant Physician, Clinical Lead for SSCA, MCN Clinical Lead	NHS Lothian, University of Edinburgh
Hazel Dodds	National Clinical Co-ordinator	NSS (ISD)
Robin Flaig	Quality Assurance Manager	NSS (ISD)/ University of Edinburgh
Sandi Haines	Stroke Specialist Nurse	NHS Borders
Therese Jackson	Consultant Occupational Therapist	NHS Grampian
Peter Langhorne	Professor of Stroke Care	NHS GG&C, University of Glasgow
Gemma Learmonth	Audit Co-ordinator	NHS GG&C
Lorna Lowdon	Speech and Language Therapist	NHS Ayrshire and Arran
Mary-Joan MacLeod	Senior Lecturer in Clinical Pharmacology, Consultant Physician	NHS Grampian, University of Aberdeen
Christine McAlpine	Consultant Physician, MCN Clinical Lead	NHS GG&C
John McCall	Stroke Specialist Nurse	NHS FV
Mike McDowall	Audit Support/ IT Development	NSS (ISD)/ University of Edinburgh
Angela McLeod	Communications Manager, Patient Representative	The Stroke Association
Keith Muir	SINAPSE Professor of Clinical Imaging	NHS GG&C, University of Glasgow
David Murphy	Senior Analyst	NSS (ISD)
John Reid	Radiologist	NHS Borders
Wesley Stuart	Consultant Vascular Surgeon	NHS GG&C
Mark Smith	Consultant Physiotherapist	NHS Lothian
Matthew Walters	CSO Clinician Scientist, Senior Lecturer	NHS GG&C, University of Glasgow
Peter Williamson	Director of Health Strategy	NHS Tayside

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This report was written and produced by the SSCA Project Team. Members include Martin Dennis, Robin Flaig, Mike McDowall, Diana Beard, David Murphy and Hazel Dodds.



Contacts

Any questions about SSCA should be referred to the Co-ordinating Centre. Please refer questions on this report to Robin Flaig and David Murphy. Please refer questions on the SSCA computer system to Mike McDowall. For general questions about the Audit please contact Hazel Dodds, National Clinical Coordinator for the SSCA.

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