SSNAP | Sentinel Stroke National Audit Programme

KING'S College LONDON

Sentinel Stroke National Audit Programme (SSNAP)

Acute Organisational Audit Report

December 2019

National Report

England, Wales and Northern Ireland

Prepared by

King's College London, Sentinel Stroke National Audit Programme on behalf of the Intercollegiate Stroke Working Party

2019

Document purpose	To disseminate the results of the SSNAP 2019 acute organisational audit of stroke services in acute trusts.
Title	SSNAP 2019 Acute Organisational Audit report
Author	On behalf of the Intercollegiate Stroke Working Party
Publication	December 2019
Target audience	Multi-disciplinary stroke teams, managers, medical directors and trust executives of sites that participated in the 2019 acute organisational audit. Health and social care professionals and healthcare management organisations including commissioners. General public and stroke survivors and their carers. NHS England, Wales and Northern Ireland.
Description	This is the fourth acute organisational audit report published under the auspices of the Sentinel Stroke National Audit Programme (SSNAP). It provides continuity with the previous 7 biennial rounds of the National Sentinel Stroke Organisational Audit and the 2012, 2014 and 2016 SSNAP acute organisational audits. It publishes national level findings on the organisation of stroke services, including acute care organisation, staffing and pathway at discharge. It reflects the organisation of stroke services as of **3 June 2019**. It should be read alongside the continuous clinical audit which reports on the care delivered by these hospitals every 3 months. Trusts can use this report to benchmark their performance against national level findings and compare themselves with national standards. This report is addressed to everyone who is interested in stroke services. It gives a comprehensive picture of current services and the style of the report should allow lay people as well as experts to read it and extract relevant information. The report presents key recommendations, an executive summary, an in-depth look at the 10 Key Indicators of the report followed by other key findings from the organisational audit. The aspects of service organisation are presented in tables, graphs and maps, along with clinical commentary. A full results portfolio (excel file) which presents all data items by named hospital is available. This year GIRFT (Getting It Right First Time) have added some questions to help in their Quality Improvement programme. These specific questions can be found in a separate tab within the full results portfolio (excel file).

Superseded	SSNAP Acute Organisational Audit 2012,2014 and 2016 National Sentinel Stroke Audit – Organisational Report (2010, 2009, 2008, 2007, 2006, 2004 and every 2 years since 1998)
Related publications	National clinical guideline for stroke 5th edition (Royal College of Physicians, 2016). Published October 2016: https://www.strokeaudit.org/Guideline/Full-Guideline.aspx The Healthy NHS Board, A review of guidance and research evidence, 2010: https://www.leadershipacademy.nhs.uk/wp-content/uploads/2013/06/NHSLeadership-HealthyNHSBoard-2010-LiteratureReview.pdf NICE Guideline NG128, 2019: https://www.nice.org.uk/guidance/ng128 NICE Clinical Guideline CG138, 2012: https://www.nice.org.uk/guidance/cg138 NICE Quality Standard QS2, 2016: https://www.nice.org.uk/guidance/QS2 NICE Quality Standard QS15, 2019: https://www.nice.org.uk/guidance/QS15 SSNAP Clinical Audit Quarterly reports: Apr – Jun 2019: https://www.strokeaudit.org/results/clinical-audit/national-results.aspx The Foundations of Good Governance, NHS Providers 2015: https://nhsproviders.org/media/1738/foundations-of-good-governance-web-file.pdf
Contact	ssnap@kcl.ac.uk

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Report Authors

Ms Kaili Stanley
SSNAP Programme Manager, King's College London

Ms Fariat Odion-Esene
SSNAP Project Coordinator, King's College London

Ms Ellie McMullen
SSNAP Project Coordinator, King's College London

Mr George Dunn
SSNAP Project Manager, King's College London

Mr Nahuel Durante
SSNAP Project Coordinator, King's College London

Mr Lanre Segilola
SSNAP Data Analyst, King's College London

Ms Tijana Savic
SSNAP Data Analyst, King's College London

Mrs Alex Hoffman
Stroke Programme Manager, King's College London

Dr Walter Muruet
SSNAP Research Fellow, King's College London

Professor Martin James
Consultant Stroke Physician, Royal Devon & Exeter Hospital
SSNAP Clinical Lead, King's College London

Report supported by

Ms Margite Isabella Borth

Miss Niat Chefena Hailemariam

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www.hqip.org.uk/nationalprogrammes

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Foreword

The Sentinel Stroke National Audit Programme (SSNAP) represents a world-leading collaborative quality improvement initiative in stroke. All participating sites and clinicians make a vital contribution to this initiative and we continue to celebrate the fact that all (well, bar one) hospital sites in England, Wales and Northern Ireland continue to upload data on all their in-patients which contributes to this substantial national effort to deliver better care for people with stroke[1]. Comprehensive comparative data of this kind provides a unique opportunity to learn from those centres that are successfully delivering first class services and support efforts to ensure that people with stroke receive equitable, high quality care no matter where they live.

This year's Acute Organisational Audit provides some welcome encouragement that these efforts are delivering a sustained improvement in some aspects of care for people with stroke. For example, there has been an encouraging increase in access to physio, occupational and speech therapy at weekends over the last three years, allied to an increase in qualified therapist numbers on stroke units. Nearly two thirds of units are now providing physiotherapy at weekends and over half are providing occupational therapy. 90% of hyperacute stroke units now report consultant-led ward rounds 7 days/week, and more of these units are reporting having the recommended number of registered nurses per 10 beds at the weekend, a Key Indicator that we know (from research conducted by the SSNAP Collaboration) is associated with much lower in-patient mortality. Hopefully both these measures reflect organisational commitment to reduce variation in the service they provide between office hours and out-of-hours – bearing in mind that about half of all people with stroke are admitted outside office hours.

The SSNAP Collaboration has already shown significant variation around the clock and across the week in access to key interventions in acute stroke including thrombolysis and acute stroke unit care, and meeting the 7-day clinical standards for stroke is a key ambition of the NHS Long Term Plan for England published earlier this year. Any hospital serious about providing a first class stroke service should be particularly scrutinising clinical quality outside office hours, be it access to imaging such as CT angiography and its interpretation or access to speech and language therapy at weekends when spouses and families are more likely to be visiting. The question acute sites should be asking themselves should be – what would our clinical quality look like (as represented by our overall SSNAP rating) if it was assessed purely on our out-of-hours service?

This year's audit also highlights some areas in need of urgent corrective action, including aspects of services that have deteriorated in the last 3 years. The most striking of these is the worsening situation with trainee and senior medical (consultant) staffing in many centres, with nearly half of all acute sites now carrying at least one consultant vacancy for a median of 12 months. This is already jeopardising the sustainability of many services and forcing service reconfiguration, and even if decisive corrective action were taken now to improve the pipeline of doctors training in stroke medicine this would come too late to remedy the situation for some services. The recent joint BASP/GIRFT publication *Meeting the Future Consultant Workforce Challenges 2019-22* (available at www.basp.ac.uk/resources/basp-publications) highlights the need for an increase of a third in consultant numbers in the UK in order to deliver services of the standard that patients should be

[1] For clarity, this refers to the SSNAP clinical audit. 100% of eligible sites are participating in the 2019 Acute Organisational Audit.

entitled to expect, and this seems a distant aspiration when nearly half of all stroke services are already running below even present workforce needs. One of the ten Key Recommendations of this report is an urgent call to action for Health Education England and regional postgraduate deans to take whatever measures are necessary to improve the prospects for training in stroke medicine, which remains an immensely interesting, stimulating and rewarding career at the forefront of modern medicine.

As my predecessor Professor Tony Rudd has done in previous years, my congratulations go out to all the clinicians, managers, audit staff and other NHS people that make SSNAP the success it has been in supporting better care for people with stroke. That collective effort has been strengthened in this year's organisational audit by the collaboration with GIRFT and the involvement of the Joint Clinical Leads of the GIRFT stroke programme, Drs Deb Lowe and David Hargroves. It is the mark of any mature and aspirational clinical service that clinicians in all disciplines are prepared to fully engage with national comparative audit in pursuit of quality improvement for their patients. This has been the hallmark of collective effort over the last 6 years of SSNAP and before that in previous incarnations of stroke audit, and we look forward to continuing to work with teams and services across the UK to improve the care we provide on a daily basis to people with stroke at their time of greatest need.

Professor Martin James
Clinical Director, Stroke Programme, and Visiting Professor, King's College London
Consultant Stroke Physician, Royal Devon & Exeter Hospital and Honorary Clinical Professor, University of Exeter
September 2019

Key Recommendations

1. All hospitals providing hyperacute stroke care should ensure that they are providing sufficient specialist nursing staff on their hyperacute stroke unit – at least 3 registered nurses per 10 beds, all of whom have received training in swallowing assessments. Patients with acute stroke should be admitted to such an appropriately staffed unit within 4 hours of hospital arrival.
Evidence links: Paley et al, 2018; Bray et al, 2014; RCP National Clinical Guideline for Stroke 2016; NICE Quality Standard QS2, 2016

2. All hospitals providing hyperacute stroke care should have a system for the pre-alert of cases of suspected stroke by pre-hospital clinicians directly to the stroke team who are then able to rapidly assess patients in the emergency department. This assessment should include rapid, round-the-clock access to diagnostics, assessment for reperfusion treatments and direct admission to a specialist stroke unit.
Evidence links: RCP National Clinical Guideline for Stroke 2016; NICE Guideline for Stroke and transient ischaemic attack in over 16s: diagnosis and initial management, NG128, 2019

3. All hospitals providing stroke rehabilitation should provide at least two types of qualified therapy for 7 days/week. Those that presently do not should examine their traditional working practices and learn from centres that have successfully implemented 7-day working.
Evidence links: RCP National Clinical Guideline for Stroke 2016; Clarke et al, 2018

4. All hospitals providing stroke rehabilitation should have access to clinical psychology as a member of the multidisciplinary rehabilitation team – at least 1 whole time equivalent qualified psychologist per 30 stroke unit beds.
Evidence links: RCP National Clinical Guideline for Stroke 2016; NICE Quality Standard QS2, 2016

5. All comprehensive stroke services should include specialist stroke rehabilitation at home, including access to an early supported discharge team with full coverage of the population.
Evidence links: RCP National Clinical Guideline for Stroke 2016; NICE Quality Standard QS2, 2016

6. All stroke services should regularly review the service they provide in the light of information on the experience of patients and carers using their service. These views should be incorporated into the strategic planning for their service, with patient representation on key decision-making groups.
Evidence links: NICE Clinical Guideline CG138, 2012; NICE Quality Standard QS15, 2019

7. All services for people with suspected TIA and minor (non-hospitalised) stroke should provide a diagnostic service that includes same-day access to specialist assessment and MRI scanning including diffusion-weighted and blood-sensitive sequences.
Evidence link: NICE Clinical Guideline NG128, 2019

8. All comprehensive stroke services should include appropriate governance oversight of the service, including as a minimum regular review of comparative national audit (SSNAP) reports by an individual with board-level responsibility for stroke governance. All services providing stroke care should have a member of their board who has specific responsibility for stroke.

Evidence links: The Healthy NHS Board, A review of guidance and research evidence, 2010; The Foundations of Good Governance, NHS Providers 2015

9. All local health systems and stroke networks should work urgently to improve access to reperfusion treatments for acute ischaemic stroke for their population, by reducing variation in the delivery of thrombolysis and extending out-of-hours coverage of regional thrombectomy services.
Evidence links: NICE Clinical Guideline NG128, 2019; RCP National Clinical Guideline for Stroke 2016; Bray et al, 2016

10. Health Education England and regional postgraduate deans should use the changes brought about by the introduction of the internal medicine curriculum and changes to stroke and neurology training curricula, to work with local health economies and trusts to reverse the decline in training in stroke medicine, as one step to rectify a situation in which nearly half of all stroke services are carrying a vacant consultant post for a median of 12 months. Without urgent action to improve the supply of trainee and consultant stroke physicians, the continuation of some stroke services will be jeopardised by the absence of consultants to deliver the service.
Evidence link: Meeting the Future Consultant Workforce Challenges 2019-22

ACUTE STROKE SERVICES

16% of sites achieved 7 out of 10 Key Indicators

87,000+ acute stroke admissions in the preceding year

48% of hospitals have a vacant stroke consultant post

183 hospitals

4,847 stroke unit beds

774 hyperacute stroke unit beds

Quality of acute hospital stroke care 2019

(% of hospitals)

Staffing workforce	7%	have the recommended staffing level for Clinical Psychology
	58%	have at least the minimum number of stroke specialist senior nurses
7-day working	30%	have the recommended level of registered nurse staffing at weekends
	38%	have at least two types of therapy available 7-days a week
	71%	provide stroke specialist nursing out of hours
Access to specialist treatment & support	38%	receive an alert from pre-hospital clinicians direct to the stroke team
	63%	have sufficient coverage of specialist ESD* team
Patient and carer engagement	56%	seek patient & carer views at least annually
TIA service	33%	provide same or next day MRI* for TIA* patients
Quality improvement & leadership	63%	trust executives review audit results annually

*Note: ESD: Early Support Discharge team.
MRI: Magnetic Resonance Imaging.
TIA: Transient Ischemic Attack.

ACUTE STROKE SERVICES

Quality of acute hospital stroke organisation 2016 - 2019

(% of hospitals)

Getting better

	2016	2019	
have the recommended level of registered nurse staffing at weekends	21%	30%	↑ +9%
have at least two types of therapy available 7-days a week	31%	38%	↑ +7%
have at least the minimum number of stroke specialist senior nurses	51%	58%	↑ +7%

Plateauing

have the recommended staffing level for Clinical Psychology	6%	7%	→ +1%

Getting worse

seek patient and carer views at least annually	61%	56%	↓ -5%

Note: 5 of the 10 Key Indicators are calculated in the same way as in the 2016 Acute Organisational Audit, these are displayed above. Please note that whilst comparisons can be made for these indicators, there have been significant changes in participating sites since the last organisational audit, so please exercise caution in making any comparisons between these data.

Executive Summary

This report provides you with an overview of the organisation of acute stroke services and information on national performance against the 10 Key Indicators of acute stroke care organisation. It describes services as at **3 June 2019**.

Introduction and Methodology

All 169 sites covering 183 (100% of eligible) acute stroke services are included in this report with 160 in England, 14 in Wales, 8 in Northern Ireland and 1 in the Isle of Man. Data were collected via a web-based audit proforma, with inbuilt validations to ensure data accuracy. Where percentages do not add up precisely to 100% this will be accounted for by rounding to the nearest whole integer. The Key Indicators were devised by the operational group.

Organisation of the Audit

The audit is run by the Stroke Programme at the School of Population Health and Environmental Sciences (SPHES) at King's College London. The audit is guided by a multi-disciplinary steering group responsible for SSNAP (see Appendix 2). In a collaboration with the NHSE/I initiative Getting It Right First Time (GIRFT), new questions were added to provide additional detail on staffing structures, diagnostics access and use and other aspects of the acute stroke service. These questions will form a key part of the GIRFT Stroke Report to be published in early summer 2020.

Availability of this Report in the Public Domain

Participating hospitals (sites) received individual results portfolios in September 2019. A full national results portfolio and national report were made available to the wider NHS, including NHS England and the Care Quality Commission in England, NHS Wales (Welsh Assembly Government) and the Department of Health, Social Services and Public Safety in Northern Ireland in September 2019. All named site results were published in December 2019 in line with the transparency agenda subject to Healthcare Quality Improvement Partnership (HQIP's) standard reporting process.

The Sentinel Stroke National Audit Programme (SSNAP) is commissioned by the Healthcare Quality Improvement Partnership (HQIP) as part of the National Clinical Audit and Patient Outcomes Programme (NCAPOP). HQIP is led by a consortium of the Academy of Medical Royal Colleges, the Royal College of Nursing, and National Voices. Its aim is to promote quality improvement in patient outcomes, and in particular, to increase the impact that clinical audit, outcome review programmes and registries have on healthcare quality in England and Wales. HQIP holds the contract to commission, manage, and develop the National Clinical Audit and Patient Outcomes Programme (NCAPOP), comprising around 40 projects covering care provided to people with a wide range of medical, surgical and mental health conditions. The programme is funded by NHS England, the Welsh Government and, with some individual projects, other devolved administrations and crown dependencies www.hqip.org.uk/national-programmes.

Results

Key Indicators of Acute Stroke Organisation

Table 1.1 on the following page defines each Key Indicator and the criterion required to meet it and reports the national performance against each. The Key Indicators are broken down into 6 different categories:

- Staffing/Workforce
- 7-day working
- Access to specialist treatment and support
- Patient and carer engagement
- TIA Service
- Quality improvement and leadership

More detailed information and results for each Key Indicator can be found in Section 2 of this report. Each Key Indicator is presented in order along with relevant contextual data, information on the standards for the Key Indicator and clinical commentary.

Table 1.1 National performance against 10 Key Indicators of 2019 acute stroke organisation

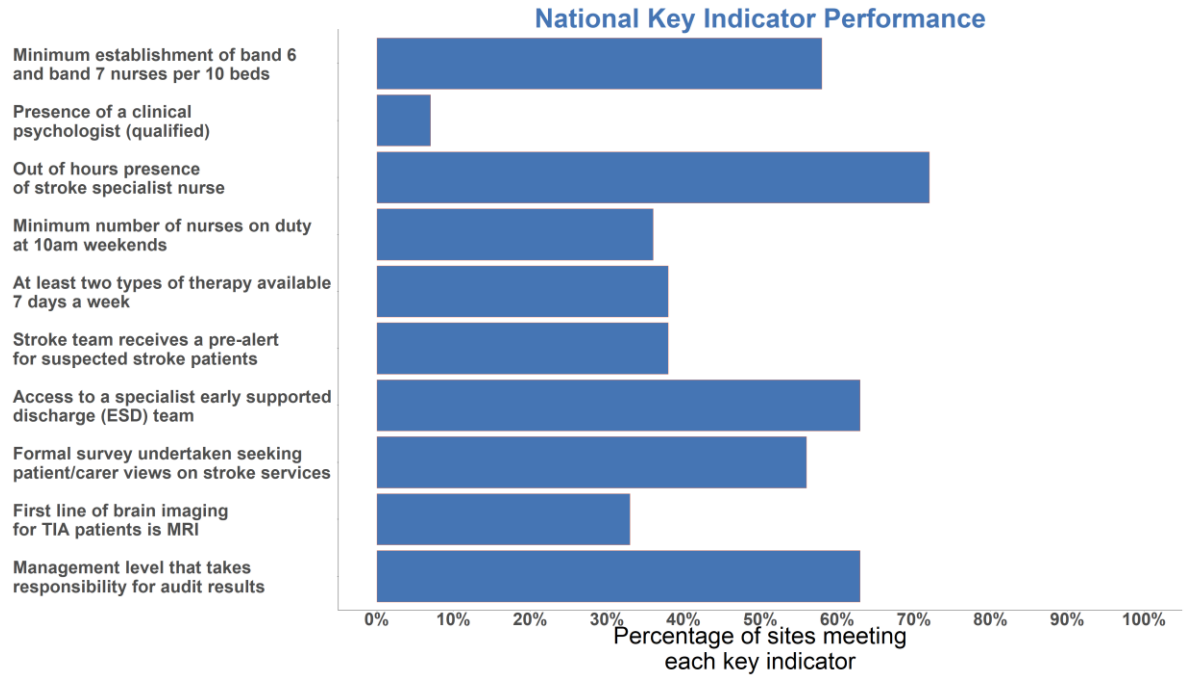
KI	Key Indicator *(Criterion for indicator)*	National results*
Staffing/Workforce		
1.	**Minimum establishment of band 6 and band 7 nurses per 10 beds** *Criterion: Sum of band 6 and 7 (WTE) nurses per 10 stroke unit beds is equal to/above 2.375 per 10 beds for ALL stroke beds**.*	**58% (98/169)** of sites meet KI 1
2.	**Presence of a clinical psychologist (qualified)** *Criterion: Presence of at least one (WTE) qualified clinical psychologist per 30 stroke unit beds*	**7% (12/169)** of sites meet KI 2
7-day working		
3.	**Out of hours presence of stroke specialist nurse** *Criterion: Met if there is at least one stroke specialist nurse per 10 beds on 10pm weekdays and 10am and 10pm weekend*	
	Type 1 beds (beds used solely for pre-72 hour care)	**71% (101/142)** of sites meet KI 3
	Type 3 beds (beds used for pre and post-72 hour care)	
4.	**Minimum number of nurses on duty at 10am weekends***** *Criterion: Met if have 3.0 WTE nurses per 10 type 1 and 3 beds (average number of nurses on duty on type 1 and type 3 beds)*	
	Type 1 beds (beds used solely for pre-72 hour care)	**30% (42/142)** of sites meet KI 4
	Type 3 beds (beds used for pre and post-72 hour care)	
5.	**At least two types of therapy available 7 days a week** *Criterion: Met if 7-day working for at least two types of qualified therapy. Includes occupational therapy, physiotherapy and speech and language therapy*	**38% (65/169)** of sites meeting KI 5
Access to specialist treatment and support		
6.	**Stroke team receives a pre-alert for suspected stroke patients** *Criterion: Met if a pre-alert is received for all types of strokes and if the call is made to stroke specialist nurse, stroke consultant on call or stroke junior doctor*	**38% (54/142)** of sites meeting KI 6
7.	**Access to a specialist (stroke/neurological specific) early supported discharge (ESD) team** *Criterion: Met if they have access to at least one stroke/neurology specific ESD team AND at least 66% of patients have access to at least one of the teams if needed*	**63% (107/169)** of sites meet KI 7
Patient and carer engagement		
8.	**Formal survey undertaken seeking patient/carer views on stroke services** *Criterion: Met if at least one a year*	**56% (95/169) of sites meet KI 8**
TIA service		
9.	**First line of brain imaging for TIA patients is MRI** *Criterion: Met if MRI is first line brain imaging for suspected TIA AND investigations are completed within 2 days*	**33% (56/169) of sites meet KI 9**
Quality improvement and leadership		
10.	**Management level that takes responsibility for audit results** *Criterion: Met if Executive on the Board, Non-executive on the Board, or Chairman of Clinical Governance takes responsibility for the follow-up of stroke audit results*	**63% (106/169) of sites meet KI 10**

** Sites assigned the performance of the site that treats their patients in the first 72 hours have not been included in the national results.*
*** The national median in 2016 for the total establishment of both these bands of nurses was 2.375 per 10 stroke beds. This was used to set a minimum standard of WTE band 6 and 7 nurses.*
****If a site has both type 1 and type 3 beds an average of Saturday and Sunday per 10 type 1 and 3 beds.*

Summary of Key Indicators

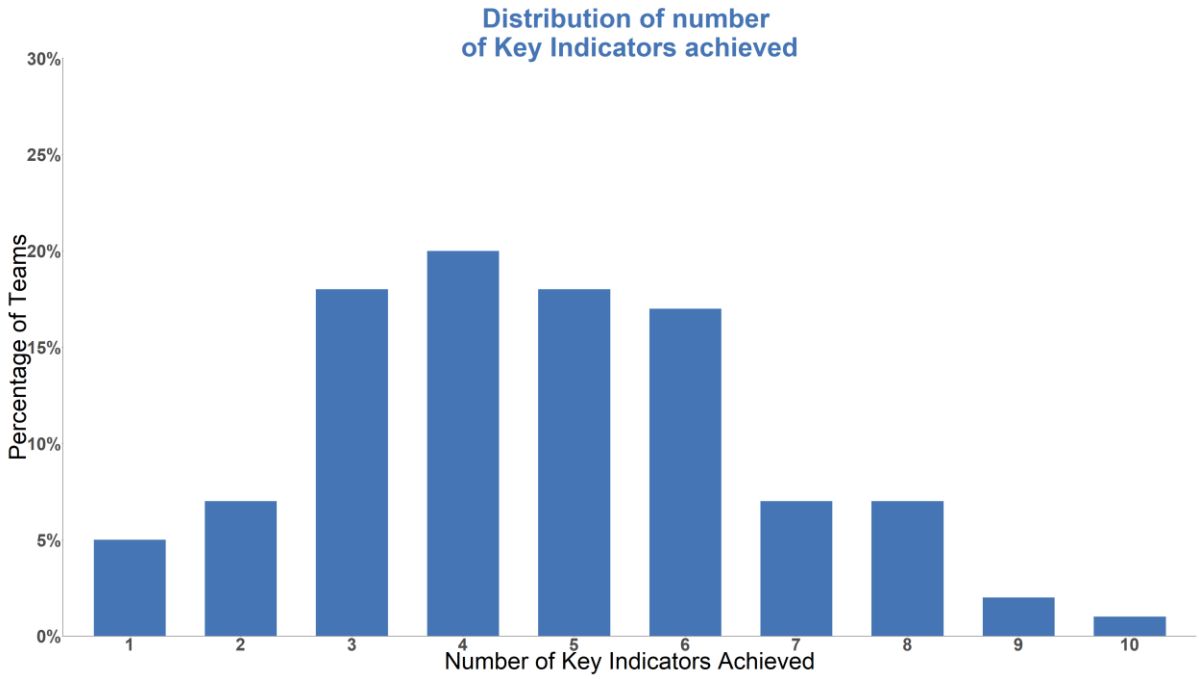
There are very few hospital sites achieving most or all of the Key Indicators in this year's organisational audit – only 10% of sites achieve 8 or more and the majority achieve 5 or fewer. There will be much that sites can learn from the small number of sites with 8 or more, particularly in the difficult areas of clinical psychology provision and achieving the recommended standard for nurse staffing on a hyperacute unit. These sites can be identified via the portfolio which is available on the SSNAP website (https://www.strokeaudit.org/results/Organisational/National-Organisational.aspx) and case studies will regularly be added. These aspects, as in 2016, are going to remain key components of a first-class comprehensive stroke service and often require persistence and sustained argument to achieve – helped by discussion and scrutiny of the results of national comparative audit from SSNAP at the highest level in any organisation or network. Services that are struggling to achieve the sort of visibility needed to bring about substantial quality improvement are invited to look at the quality improvement case studies available on the SSNAP website or to discuss the potential for a multidisciplinary peer review visit with the SSNAP office, and/or to engage with their regional GIRFT Hub or GIRFT Clinical Leads for support with quality improvement.

Figure 1: National Key Indicator performance*



**Please see table 1.1 above for full description of each Key Indicator.*

Figure 2: Distribution of Key Indicators achieved*



Please see table 1.1 above for full description of each Key Indicator.

Staffing/Workforce

KI.1 Nursing

Key Indicator 1 **Minimum Establishment of band 6 and band 7 nurses per 10 beds**	
2016	**2019**
51% (90/178) of sites meet Key Indicator	**58% (98/169)** of sites meet Key Indicator
Key Indicator achieved if: *Sum of band 6 and 7 (WTE) nurses per 10 stroke unit beds is equal to/above 2.375 per 10 beds*	

Standard

2016 RCP National Clinical Guideline for Stroke, 5th Edition

Recommended staffing levels for stroke units (table 2.1)

	Physiotherapist WTE per 5 beds	**Nurse WTE per bed**
Hyperacute Stroke Unit	0.73	2.9 (80:20 registered: unregistered)
Acute Stroke Unit	0.84	1.35 (65:35 registered: unregistered)

There has been an encouraging rise in the number of senior nurses on the establishment of stroke units, although there are still substantial differences within the UK, with fewer whole time equivalent senior nurses in stroke units in Wales and Northern Ireland than in England. Many of the components of the effective intervention that is stroke unit care depend upon nursing skills (detection and monitoring of unstable or deteriorating patients, and the promotion of continence being just two examples) and so senior clinical leadership among stroke-skilled nurses is critical to reducing the population burden of disability after stroke. There is now clear multi-professional guidance regarding nurse staffing for hyperacute and acute stroke units (available in the 2016 National Clinical Guideline for Stroke) and the competencies that they should possess, and hospitals should be following this guidance if they are to maximise the patient and organisational benefits of specialist stroke unit care.

Table 1.2: Total establishment of registered nurses whole time equivalents (WTE) per 10 beds all Stroke Unit (SU) beds, and by type of SU bed

Total establishment of nurses (bands 5-8a) for all stroke beds (Q2.7, 2.12 & 2.19) Median (IQR*)			Total stroke unit beds	Type 1 beds	Type 2 beds	Type 3 beds
			2016 (178 sites)	**2016** (73 sites)	**2016** (92 sites)	**2016** (105 sites)
			2019 (169 sites)	**2019** (86 sites)	**2019** (105 sites)	**2019** (81 sites)
Band 5 Nurses	**2016**	Total WTE	18.4 (12.8-28.9)	7.9 (4.6-13.0)	14.3 (11.3-20.1)	14.2 (10.4-18.7)
		WTE per 10 beds	7.3 (5.9-8.8)	10.7 (7.6-14.8)	7.0 (5.7-8.0)	7.0 (5.6-8.1)
	2019	Total WTE	17.7 (12.4-24.6)	7.0 (4.1-13.2)	12.9 (9.7-17.0)	14.1 (9.0-18.3)
		WTE per 10 beds	7.0 (5.6-8.2)	9.1 (6.0-13.9)	6.5 (4.8-7.8)	6.6 (5.2-7.6)
Band 6 Nurses	**2016**	Total WTE	4.4 (2.0-7.7)	3.0 (1.0-6.6)	2.8 (2.0-4.0)	3.0 (2.0-5.0)
		WTE per 10 beds	1.7 (1.0-2.5)	4.2 (1.7-7.4)	1.3 (0.8-1.7)	1.3 (0.8-2.2)
	2019	Total WTE	5.3 (3.0-8.8)	3.4 (2.0-6.0)	3.0 (2.0-4.1)	3.8 (2.0-6.0)
		WTE per 10 beds	1.9 (1.4-2.9)	3.8 (2.5-6.9)	1.4 (0.9-2.0)	1.7 (1.1-2.9)
Band 7 Nurses	**2016**	Total WTE	2.0 (1.0-2.4)	1.0 (0.4-1.4)	1.0 (1.0-1.4)	1.0 (1.0-2.0)
		WTE per 10 beds	0.6 (0.4-0.9)	1.1 (0.5-1.8)	0.5 (0.4-0.6)	0.6 (0.4-1.0)
	2019	Total WTE	1.5 (1.0-2.0)	1.0 (0.2-1.4)	1.0 (1.0-1.0)	1.0 (0.9-1.5)
		WTE per 10 beds	0.5 (0.4-0.8)	0.8 (0.4-1.7)	0.5 (0.4-0.6)	0.5 (0.3-0.7)
Band 8a Nurses	**2016**	Total WTE	0.0 (0.0-0.5)	0.0 (0.0-0.0)	0.0 (0.0-0.1)	0.0 (0.0-0.1)
		WTE per 10 beds	0.0 (0.0-0.1)	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.0 (0.0-0.1)
	2019	Total WTE	0.0 (0.0-0.8)	0 (0.0-0.2)	0.0 (0.0-0.3)	0.0 (0.0-0.2)
		WTE per 10 beds	0.0 (0.0-0.2)	0.0 (0.0-0.3)	0.0(0.0-0.1)	0.0 (0.0-0.1)

** Interquartile range*

KI.2 Clinical Psychology

Key Indicator 2 **Presence of a qualified clinical psychologist**	
2016	**2019**
6% (10/178) of sites meet Key Indicator	**7% (12/169)** of sites meet Key Indicator
Key Indicator achieved if: ***Presence of at least one (WTE) qualified clinical psychologist per 30 stroke unit (SU) beds***	

Standard

NICE Quality Statement

Statement 3: Adults who have had a stroke have access to a clinical psychologist with expertise in stroke rehabilitation who is part of the core multi-disciplinary stroke rehabilitation team. [New 2016]

2016 RCP National Clinical Guideline for Stroke, 5th Edition

2.12.1

A Services for people with stroke should have a comprehensive approach to delivering psychological care that includes specialist clinical neuropsychology/clinical psychology input within the multi-disciplinary team.

B Services for people with stroke should offer psychological support to all patients regardless of whether they exhibit specific mental health or cognitive difficulties and use a matched care model to select the level of support appropriate to the person's needs.

C Services for people with stroke should include specialist clinical neuropsychology/clinical psychology provision for severe or persistent symptoms of emotional disturbance, mood or cognition.

Unfortunately, there has been no change in the access that people with stroke and complex cognitive and psychological needs have to expertise in clinical psychology, and this remains poor for the great majority. The median number of clinical psychologists working on UK stroke units in 2019 is unchanged from 2014 at 0.00. The importance of clinical psychology within the stroke multidisciplinary team has been reiterated in recent national guidelines (RCP, 2016), but there remain what appear to be insurmountable barriers to improving access to psychological therapies for people with significant physical, psychological and cognitive disabilities as a result of stroke. A new approach may be required if this shortfall in provision is going to be rectified in the foreseeable future.

Table 1.3: Access to qualified clinical psychologists

Sites with access to qualified clinical psychologists (Q5.2)	**National 2014** (183 sites) % (n)	**National 2016** (178 sites) % (n)	**National 2019** (169 sites) % (n)
Presence of at least one whole time equivalent (WTE) qualified clinical psychologist per 30 stroke beds (Key Indicator 2)	N/A	**6% (10/178)**	**7% (12/169)**
Presence of at least one qualified clinical psychologist	54% (98)	57% (101)	51% (86)
Median (IQR) **WTE of qualified** clinical psychologist	0.1 (0.0-0.5)	0.1 (0.0-0.4)	0.1 (0.0-0.4)
Median (IQR) **WTE/per 10 beds of qualified** clinical psychologists	0.0 (0.0-0.2)	0.0 (0.0-0.1)	0.0 (0.0-0.1)
Percentage of sites with qualified clinical psychologists **working 7-days a week**	1% 1/98	2% 2/101	0% 0/86

Seven Day Working

KI.3 Out of Hours Access to Stroke Specialist Nursing

Key Indicator 3
Out of hours presence of stroke specialist nurse

2016	2019
N/A	**71% (101/142)** of sites meet Key Indicator

Key Indicator achieved if:
"Yes" to Question 1.7, and congruent responses to Questions: 2.4, 2.6, 2.16, 2.18 (i.e. at least one nurse per 10 beds on 10pm weekdays, and 10am and 10pm weekends)

Standard
2016 RCP National Clinical Guideline for Stroke, 5th Edition

2.4.1

C A hyperacute stroke unit should have immediate access to:

- specialist medical staff trained in the hyperacute and acute management of people with stroke, including the diagnostic and administrative procedures needed for the safe and 16 timely delivery of emergency stroke treatments;
- specialist nursing staff trained in the hyperacute and acute management of people with stroke, covering neurological, general medical and rehabilitation aspects;
- stroke specialist rehabilitation staff.

E An acute stroke unit should provide:

- specialist medical staff trained in the acute management of people with stroke;
- specialist nursing staff trained in the acute management of people with stroke, covering neurological, general medical and rehabilitation aspects;
- stroke specialist rehabilitation staff.

This is a new Key Indicator for this year's Acute Organisational Audit, and reflects the importance both of out of hours care and of getting access to stroke-specialist expertise at the first opportunity – the assessment of suspected stroke patients in Emergency departments by stroke specialist nurse(s) with appropriate seniority. This year the indicator is interpreted fairly liberally, in that any out-of-hours provision will qualify for the indicator, but centres intending to provide round-the-clock hyperacute stroke care should in reality be making provision for 24/7 access to specialist assessments at the front door. Without this, people with acute stroke being admitted to Emergency departments that are getting steadily busier year-on-year will face delays in assessment, diagnostic tests and critical early interventions such as stroke unit admission that will contribute to greater disability and poorer outcomes. Despite this, somehow 41 hospitals in the UK are ostensibly providing hyperacute stroke care with no access to early specialist nursing assessment for half of all their patients.

Table 1.4: Key Indicator 3: Out of hours presence of stroke specialist nurse

Out of hours presence of stroke specialist nurse (Key Indicator 3) (Q1.7)	National **2019** (142 sites) % (n)
	71% (101)

KI.4 Weekend Nurse Staffing

Key Indicator 4 **Minimum number of nurses on duty at 10am weekends**	
2016	**2019**
21% (32/156) of sites meet Key Indicator	**30% (42/142)** of sites meet Key Indicator
Key Indicator achieved if: *3.0 nurses per 10 type 1 and 3 beds (average number of nurses on duty on type 1 and type 3 beds)*	

There is strong observational evidence from very large datasets that the ratio of registered nurses to patients on an acute stroke unit is a key determinant of early survival for people with stroke (Bray et al, 2014; Paley et al, 2018), even after adjustment for a range of other organisational factors that might be considered to contribute, including the number of consultant ward rounds. The strongest relationship is with the ratio of registered nurses at the weekend, which almost certainly reflects an organisation's commitment to provide round-the-clock care and remove fluctuations in care quality within and outside office hours. Although there has been an encouraging increase in the number of hospitals that are taking this issue seriously and implementing the evidence, the proportion overall remains low at 30% and this leaves precisely 100 acutely admitting sites providing care with inadequate staffing levels to achieve the best outcomes for their hyperacute stroke patients.

Table 1.5: Registered nurses on duty at 10am weekends: Type 1 beds

Registered nurses usually on duty at 10am weekends (Q2.4(i))	% (n) in category **2014** (75 sites)	% (n) in category **2016** (73 sites)	% (n) in category **2019** (86 sites)
Sites with 3 or more nurses **(Key Indicator 4)**	N/A	56% (41)	49% (42)
Sites with 2-2.9 nurses	N/A	33% (24)	28% (28)
Sites with fewer than 2 nurses	N/A	11% (8)	19% (16)
National median (IQR*) per 10 beds	3.3 (2.5-5.0)	3.3 (2.5-4.2)	3.3 (2.5-4.8)

** Interquartile range*

Table 1.6: Registered nurses on duty at 10am weekends: Type 3 beds

Registered nurses usually on duty at 10am weekends (Q2.16(i))	% (n) in category **2014** (109 sites)	% (n) in category **2016** (105 sites)	% (n) in category **2019** (81 sites)
Sites with 3 or more nurses **(Key Indicator 4)**	N/A	3% (3)	77% (62)
Sites with 2-2.9 nurses	N/A	34% (36)	17% (14)
Sites with fewer than 2 nurses	N/A	63% (66)	6% (5)
National median (IQR*) per 10 beds	1.7 (1.5-2.1)	1.8 (1.6-2.1)	1.7 (1.5-2.1)

** Interquartile range*

Table 1.7: Median number of nurses on duty at 10pm weekends: Type 1 and 3 beds

Registered nurses usually on duty at 10pm/10 stroke beds (Q2.6(i) & Q2.18(i)) Median (Interquartile range)			Total stroke units	Type 1 beds	Type 3 beds
			2014 (183 sites)	**2014** (75 sites)	**2014** (109 sites)
			2016 (178 sites)	**2016** (73 sites)	**2016** (105 sites)
			2019 (169 sites)	**2019** (86 sites)	**2019** (81 sites)
Saturdays	**2014**	Number per 10 beds	1.3 (1.0-1.7)	3.0 (1.7-3.9)	1.2 (0.9-1.5)
	2016	Number per 10 beds	1.4 (1.2-1.7)	2.5 (2.2-3.9)	1.3 (1.0-1.5)
	2019	Number per 10 beds	1.4 (1.2-1.8)	2.5 (2.0-4.0)	1.2 (1.1-1.7)
Sundays / Bank Holidays	**2014**	Number per 10 beds	1.3 (1.0-1.7)	3.0 (1.7-3.9)	1.2 (0.9-1.5)
	2016	Number per 10 beds	1.4 (1.2-1.7)	2.5 (2.2-3.9)	1.3 (1.0-1.5)
	2019	Number per 10 beds	1.4 (1.2-1.8)	2.5 (2.0-4.0)	1.2 (1.1-1.7)

Table 1.8 Median number of nurses on duty at 10am trained in swallow screening

Nurses trained in swallow screening usually on duty at 10am (Q2.5(i) & Q2.17(i)) Median (Interquartile range)			Total stroke units	Type 1 beds	Type 3 beds
			2014 (183 sites)	**2014** (75 sites)	**2014** (109 sites)
			2016 (178 sites)	**2016** (73 sites)	**2016** (105 sites)
			2019 (169 sites)	**2019** (86 sites)	**2019** (81 sites)
Weekdays	**2014**	Number per 10 beds	1.4 (0.9-1.9)	2.5 (1.7-3.3)	1.4 (0.9-1.9)
	2016	Number per 10 beds	1.5 (0.9-1.9)	2.5 (2.1-4.0)	1.6 (0.9-1.8)
	2019	Number per 10 beds	1.5 (1.1-2.1)	2.5 (2.0-4.3)	1.6 (0.9-1.8)
Saturdays	**2014**	Number per 10 beds	1.4 (0.8-1.7)	2.5 (1.7-3.3)	1.3 (0.8-1.8)
	2016	Number per 10 beds	1.3 (0.8-1.7)	2.5 (1.7-3.8)	1.4 (0.8-1.7)
	2019	Number per 10 beds	1.4 (0.9-2.0)	2.5 (2.0-4.0)	1.4 (0.8-1.8)
Sundays / Bank Holidays	**2014**	Number per 10 beds	1.3 (0.8-1.7)	2.5 (1.7-3.3)	1.3 (0.8-1.8)
	2016	Number per 10 beds	1.3 (0.8-1.7)	2.5 (1.7-3.8)	1.4 (0.8-1.7)
	2019	Number per 10 beds	1.4 (0.9-2.0)	2.5 (2.0-4.0)	1.4 (0.8-1.8)

KI.5 Seven Day Therapy Access

Key Indicator 5 **At least two types of therapy available 7 days a week**	
2016	**2019**
31% (55/178) of sites meet Key Indicator	**38% (65/169)** of sites meet Key Indicator
Key Indicator achieved if: *7-day working for at least two types of qualified therapy. Includes occupational therapy, physiotherapy and speech and language therapy*	

Standard

NICE Quality Statement

Statement 2: Adults having stroke rehabilitation in hospital or in the community are offered at least 45 minutes of each relevant therapy for a minimum of 5 days a week.
[2010, updated 2016]

2016 RCP National Clinical Guideline for Stroke, 5th Edition

2.11.1
A: People with stroke should accumulate at least 45 minutes of each appropriate therapy every day, at a frequency that enables them to meet their rehabilitation goals, and for as long as they are willing and capable of participating and showing measurable benefit from treatment.

There has been an encouraging increase in access to physio, occupational and speech therapy at weekends over the last three years, allied to an increase in qualified therapist numbers on stroke units. 62% of units are now providing physiotherapy (PT) on 6 or 7 days/week and 58% providing occupational therapy (OT). There is still substantial room for improvement in weekend speech and language therapy (SLT) provision, with only 22% of units providing SLT at weekends when there may be a greater opportunity to train visiting spouses and families in communication with people with aphasia. These trends correspond with the change in the national guideline for stroke rehabilitation in 2016, which includes the recommendation that all appropriate therapies are offered not 5 but 7 days/week (National Clinical Guideline for Stroke, 2016), but it still leaves 90 stroke units with the overdue need to scrutinise their traditional rotas and working practices in order to improve therapy access across the whole week.

Table 1.9: Number of sites providing two types of therapy 7-days a week

Number of sites providing two types of therapy (qualified) 7-days a week (Q5.2)	**2016 National** 178 sites % (n)	**2019 National** 169 sites % (n)
At least two types of qualified therapy provided 7 days a week* (Key Indicator 5)	31% (55)	38% (65)

**At least two types of qualified therapists from occupational therapy, physiotherapy and speech and language therapy (qualified only)*

Table 1.10 below shows the combinations of qualified therapists available 7-days a week within participating sites.

Table 1.10: National breakdown of qualified therapy staff disciplines working 7 days with participating sites

Combinations of qualified therapy types working 7 days (Q5.2)	**2016 National** (178 sites) % (n)		**2019 National** (169 sites) % (n)	
All three types of therapy	6%	(11)	9%	(15)
Occupational therapy and physiotherapy	25%	(44)	29%	(49)
Speech and language therapy and physiotherapy	0%	(0)	1%	(1)
Physiotherapy only	9%	(16)	8%	(13)
Speech and language therapy only	0%	(0)	1%	(1)
No types of therapy available 7 days a week	60%	(107)	53%	(90)

Further detail is available in Table 1.29

Access to Specialist Treatment and Support

KI.6 Stroke Team Alerted Before Arrival at Hospital (Pre-Alert)

Key Indicator 6

Pre-alert to a relevant member of the stroke team

2016	**2019**
N/A	**38% (54/142)** of sites meet Key Indicator

Key Indicator achieved if:

Site pre-alert for all stroke patients and the individual pre-alerted is a stroke nurse, stroke consultant or junior stroke doctor

Standard

2016 RCP National Clinical Guideline for Stroke, 5th Edition

3.1.1

C: The pre-hospital care of people with suspected stroke should minimise time from call to arrival at hospital and should include a hospital pre-alert to expedite specialist assessment and treatment.

This is another new Key Indicator in this year's audit, which again reflects the importance of the earliest possible access for people with suspected stroke to specialist expertise in the pre-hospital phase. The number of conditions that require a pre-alert to Emergency Departments by an ambulance crew increases all the time, with the result that a pre-alert that goes only to the ED risks delay in onward transmission or being deprioritised among all the other competing urgencies in the ED. Direct communication between an ambulance crew and the stroke team allows the exchange of

important clinical information and should expedite assessment and diagnosis for all cases of suspected stroke, not just those eligible for thrombolysis. However, even with a fairly liberal interpretation of this indicator to include any grade of stroke junior doctor, fewer than 4 in 10 hyperacute sites are providing the sort of direct link with ambulance crews that should improve early specialist access for all suspected stroke and help to reduce door-to-needle time for thrombolysis cases. With the increasing importance of pre-hospital diagnostics in patient selection and the potential for diversion of suspected large artery occlusions, improving the direct access of pre-hospital clinicians to an appropriate hospital specialist is going to become an increasingly important aspect of everyday hyperacute stroke care.

Table 1.11: Key Indicator 6: Pre-alert relevant member of the stroke team

Key Indicator 6: Stroke team receives a pre-alert question for suspected stroke patients. (Q1.10)		**National 2019** (142 sites) % (n) 38% (54)
Do the stroke team receive a pre-alert (telephone call) from your ambulance crews for **thrombolysis candidates only**	Yes	80% (113)
	No	11% (16)
	Sometimes	9% (13)
Do the stroke team receive a pre-alert (telephone call) from your ambulance crews for **all FAST positive**	Yes	69% (98)
	No	11% (15)
	Sometimes	20% (29)
Do the stroke team receive a pre-alert (telephone call) from your ambulance crews for **all other suspected strokes**	Yes	37% (52)
	No	15% (22)
	Sometimes	48% (68)

Table 1.12: Key Indicator 6 recipient of pre-alert

Key Indicator 6: Stroke team receives a pre-alert question for suspected stroke patients. (Q1.11)		**National 2019** (142 sites) % (n) 38% (54)
Pre-alert call made to	Stroke Specialist Nurse	44% (63)
	Stroke Junior Doctor on call	13% (19)
	Stroke Consultant on call	12% (17)

KI.7 Specialist Early Supported Discharge (ESD)

Key Indicator 7 **Access to a specialist (stroke/neurological specific) early supported discharge team**	
2016	**2019**
N/A*	**63% (107/169)** of sites meet Key Indicator
Key Indicator achieved if: ***Hospital have access to at least one stroke/neurology specific early supported discharge multidisciplinary team AND at least 66% of patients have access to at least one of the teams if needed***	

**Criteria for key indicator 5 has changed since 2016, so data are not directly comparable. For 2019, teams must have access to at least one specialist early supported discharge team AND have a coverage of at least 66% of patients.*

Standard

NICE Quality Statement

Statement 4: Adults who have had a stroke are offered early supported discharge if the core multi-disciplinary stroke team assess that it is suitable for them.
[New 2016]

2016 RCP National Clinical Guideline for Stroke, 5th Edition

2.7.1
A: Hospital in-patients with stroke who have mild to moderate disability should be offered early supported discharge, with treatment at home beginning within 24 hours of discharge.

Access for people with stroke to early supported discharge, at a level of therapy intensity that is equivalent or better than that available by remaining as an in-patient, is a key intervention in stroke rehabilitation with benefits for patients and for organisations. As such, it is recommended by expert guidelines (RCP, 2016) and the 2016 NICE Quality Standard as a key component of a comprehensive stroke service. For this year's audit, the threshold has been raised by linking the Key Indicator to population coverage – only those services with coverage of at least two-thirds of their population are considered to have achieved the indicator. Given the length of time that the evidence of benefit from early supported discharge has been available and the strength and breadth of the evidence base, all stroke services should be providing full coverage, but despite this, over a third of services are still not doing so and this situation needs to be remedied urgently so that all patients have equal access to this effective intervention.

Table 1.13: Access to specialist early supported discharge (ESD)

Access to specialist early supported discharge (Q6.1(a) & (b))	**National 2014** (183 sites) % (n)	**National 2016** (178 sites) % (n)	**National 2019** (169 sites) % (n)
Site has **access to at least one specialist early supported discharge** (ESD) team	74% (135)	81% (145)	85% (143)
	Median, interquartile range (IQR)n/N		
Percentage of patients at the site which have **access to at least one specialist early supported discharge** (ESD) team	100% 85-100% (IQR) 91/135 with 100%	100% 80%-100% (IQR) 83/145 with 100%	100% 67%-100% (IQR) 85/143 with 100%

Patient and Carer Engagement

KI.8 Formal Survey Undertaken Seeking Patient/Carer Views on Stroke Services

Key Indicator 8

Formal survey undertaken seeking patient/carer views on stroke services

2016	**2019**
61% (108/178) of sites meet Key Indicator	**56% (95/169)** of sites meet Key Indicator

Key Indicator achieved if:

Formal survey undertaken seeking patient/carer views on stroke services at least once a year

Standard

2016 RCP National Clinical Guideline for Stroke, 5th Edition

2.8.1

D: The views of people with stroke and their family/carers should be actively sought when evaluating service quality and safety, and when planning service developments.

NICE Quality Standard 15

Statement 4: People using adult NHS services experience care and treatment that is tailored to their needs and preferences. [2012, updated 2019]

It is disappointing to find this year that the proportion of sites that are seeking the views of patients and carers, even as infrequently as once a year, has fallen to little over a half. At the same time fewer than half of sites have patient or carer representation on their strategic planning group. Learning from the experiences of people with stroke and their carers takes time and effort and is rarely afforded the resources needed to be done properly. However, for patient-centred care to be

anything more than mere tokenism, that effort is needed and typically more than pays off in the insight that it yields into the lived experience of being a person with stroke and will contribute to improvements in the patient and carer experience of stroke services.

Table 1.14: Seeking patient/carer views on stroke services

Patient views on stroke services		**National 2016** (178 sites) % (n)		**National 2019** (169 sites) % (n)	
Frequency of a formal survey seeking patient/carer views on stroke services. (Q9.7) **(Key Indicator 8)**	Continuous (every patient)	31%	(56)	25%	(42)
	More than 4 times a year	10%	(17)	8%	(14)
	3-4 times a year	3%	(5)	4%	(6)
	1-2 times a year	17%	(30)	20%	(33)
	Less than once a year	28%	(49)	23%	(39)
	Never	12%	(21)	21%	(35)
Patient views on stroke services		**National 2016** (164 sites) % (n)		**National 2019** (148 sites) % (n)	
Representation on stroke strategic group (Q9.2)	Ambulance trust representative	50%	(82)	51%	(76)
	Clinician	99%	(163)	100%	(148)
	Patient representative	54%	(88)	45%	(67)
	Commissioner	66%	(109)	62%	(92)
	Social Services	45%	(73)	28%	(42)
	Stroke Network representative	56%	(92)	53%	(78)
	Trust board member	47%	(77)	42%	(62)

TIA Service

KI.9 First Line of Brain Imaging for TIA Patients

Key Indicator 9

First line of brain imaging for TIA patients is MRI

2016	2019
N/A	**33% (56/169)** of sites meet Key Indicator

Key Indicator achieved if:

Answer to question 4.10a is MRI, and question 7.11 is next weekday, the next day, the same day (5 days a week) or the same day (7 days a week)

Standard

Stroke and transient ischaemic attack in over 16s: diagnosis and initial management, NICE NG128

1.2.2

After specialist assessment in the TIA clinic, consider MRI (including diffusion weighted and blood-sensitive sequences) to determine the territory of ischaemia, or to detect haemorrhage or alternative pathologies. If MRI is done, perform it on the same day as the assessment. [2019]

This new Key Indicator for 2019 reflects the recommendation from the 2019 NICE Guidelines for acute stroke and TIA (NG128) that if brain imaging is to be used in TIA, then it should be same-day MRI and include diffusion-weighted and blood-sensitive sequences. The NICE Guideline specifically advises against the use of CT as first-line imaging other than in specific circumstances. 45% of sites providing TIA services are now using MRI as first-line brain imaging, but the proportion meeting this standard falls to just over a third when applying the relatively liberal criterion that MRI should be performed at least by the next working day. The argument that scarcity of MRI, or other competing demands, precludes its use for TIA clinics is undermined by the experience of a significant number of TIA services, and rapid progress is now required to ensure that MRI becomes universally available in support of all TIA services.

Table 1.15 First line brain imaging most frequently used for suspected TIAs

Key Indicator 9: First line of brain imaging for TIA patients is MRI AND investigations are completed within 2 days (Next weekday, the next day, the same day (5 days a week) or the same day (7 days a week))		**National 2019** (169 sites) % (n)
First line brain imaging used (type) (Q4.10(a))	Computed Tomography	50% (85)
	Magnetic Resonance Imaging	45% (76)
	Rarely image TIAs	5% (8)

Table 1.16 Timescale for investigating and initiating treatment

Key Indicator 9: First line of brain imaging for TIA patients is MRI AND investigations are completed within 2 days (Next weekday, the next day, the same day (5 days a week) or the same day (7 days a week))		**National 2019** 160 sites % (n)
Timescale taken to investigate and initiate treatment for **ALL** outpatients? (Q7.11)	The same day (7 days a week)	31% (50)
	The same day (5 days a week)	26% (41)
	The next day	14% (23)
	The next weekday	8% (13)
	Within a week	19% (31)
	Within a month	1% (2)
	Longer than a month	0% (0)

Quality Improvement and Leadership

KI.10 Management Level that Takes Responsibility for Audit Results

Key Indicator 10
Management level that takes responsibility for audit results

2016	**2019**
N/A	**63% (106/169)** of sites meet Key Indicator

Key Indicator achieved if:
Answer to question 9.1 is one of Executive on the Board, Non-executive on the Board, or Chairman of Clinical Governance

Achieving sustained quality improvement in stroke services depends critically on the highest level organisational commitment, something which varies significantly across the UK. There has been a

concerning decline in the involvement of board-level officers (executive and non-executive board members) in strategic planning for stroke services and in taking responsibility for the implementation of findings from national comparative audit. At the very least it should be essential for the Chairman of Clinical Governance to have oversight of national stroke audit at least once a year, and it is disconcerting to see that for over a third of stroke services, visibility of comparative audit in stroke does not rise above directorate level. Although it is a responsibility on clinical leads of stroke services to pursue board-level understanding of and commitment to such an important area of any hospital's activity, if this is met by disengagement from senior decision makers it is sure to create problems with quality improvement in stroke when set against the multitude of other competing organisational pressures. We must hope that the significance given to stroke (at least in England) in the NHS Long Term Plan reverses this decline and leads to renewed board-level engagement with stroke services and planning as this is critical to national quality improvement and the reductions in clinical variation that we all want to see.

Table 1.17 Level of management responsible for reviewing SSNAP results

Key Indicator 10: Management level that takes responsibility for audit results		**National 2019** 169 sites % (n)
Management level that takes responsibility for the follow-up of the results and recommendations of the Sentinel Stroke Audit? (Q9.1)	Executive on the Board	58% (98)
	Non-executive on the Board	17% (28)
	Chairman of Clinical Governance (or equivalent)	25% (43)

Other Key Findings

A Type and Number of Stroke Unit Beds

142 sites in England, Wales and Northern Ireland are now providing acute stroke care, down from 156 three years ago when the Acute Organisational Audit was last conducted. There has been a corresponding reduction in the overall number of beds on stroke units of 5% (2016: 5119 beds; 2019: 4847 beds), although the proportion of those beds regarded as 'hyperacute' has increased by 29% from 601 to 774.

Table 1.18 Type and number of stroke unit (SU) beds

Type and number of stroke unit (SU) beds (Q2.1)	Total N of beds **2014**	Total N of beds **2016**	Total N of beds **2019**	% n Site level		
				%	n	Median (IQR)
Beds solely used for patients in **first 72 hours** after stroke (type 1 beds) (Q2.1c)	National (183 sites)	National (178 sites)	National (169 sites)			
	681	601	774	51%	86	8 (4.2-12.0)
Beds for **pre- and post-72 hour** care (type 3 beds) (Q2.1e)	2381	2349	1759	48%	81	23 (16-26)
Beds solely used for patients **beyond 72 hours** (type 2 beds) (Q2.1d)	National (183 sites)	National (178 sites)	National (171 sites)			
	2178	2169	2314	62%	105	20 (16-26)
Total number of beds	5250	5119	4847			

B Access to Specialist Treatment and Support

There are 24 centres commissioned to provide mechanical thrombectomy (MT or intra-arterial treatment) – all are regional neurosciences centres: one each in Wales and Northern Ireland and the remainder in England. Two centres now provide a 24/7 MT service, 4 provide extended hours that include the weekend, and 2 provide extended hours on weekdays – two-thirds of sites remain 'office hours only'. Belfast provides only an 'office hours' service but delivers a much higher rate of MT than most other sites. 93% of acute sites have access to some MT service, however limited.

2016 RCP National Clinical Guideline for Stroke, 5th Edition

3.5.1
G Patients with acute ischaemic stroke should be considered for combination intravenous thrombolysis and intra-arterial clot extraction (using stent retriever and/or aspiration techniques) if they have a proximal intracranial large vessel occlusion causing a disabling neurological deficit (National Institutes of Health Stroke Scale [NIHSS] score of 6 or more) and the procedure can begin (arterial puncture) within 5 hours of known onset.

Table 1.19: Patient access to intra-arterial (thrombectomy) treatment

Use of intra-arterial (thrombectomy) treatment to treat patients with acute stroke (Q3.3 & 3.6)	**National 2014** (167 sites) % (n)		**National 2016** (158* sites) % (n)		**National 2019** (144* sites) % (n)	
Sites whose patients have access to intra-arterial (thrombectomy) treatment	Yes, on-site	13% (21)	Yes, on-site	18% (28)	Yes, on-site	18% (26*)
	Yes, by referral	42% (70)	Yes, by referral	50% (79)	Yes, by referral	75% (108)
	No	46% (76)	No	32% (51)	No	7% (10)

** There are 2 sites that have patients referred to them for intra-arterial treatment, but do not have an acute service on site. They submitted information on their thrombectomy service only*

C Telemedicine

The majority of the 93 sites using telemedicine (54%) are using it solely for thrombolysis decision-making, rather than for other, potentially more complex cases. This represents a missed opportunity to bring expertise to bear on a range of other hyperacute stroke problems other than simply the decision to thrombolyse or not.

Table 1.20: Use of telemedicine to allow remote access for management of acute stroke care

Groups of patients assessed using telemedicine (Q1.19)	**National 2016** (105 sites) % (n)	**National 2019** (93 sites) % (n)
All patients	9% (9)	13% (12)
Some patients	30% (32)	33% (31)
Only patients eligible for thrombolysis	61% (64)	54% (50)

D Specialist Stroke Consultant Ward Rounds

90% of hyperacute stroke units (HASUs) now have at least one consultant-led ward round 7 days a week – an increase from 84% in 2016.

2016 RCP National Clinical Guideline for Stroke, 5th Edition

2.4.1

C A hyperacute stroke unit should have immediate access to:

- specialist medical staff trained in the hyperacute and acute management of people with stroke, including the diagnostic and administrative procedures needed for the safe and timely delivery of emergency stroke treatments;
- specialist nursing staff trained in the hyperacute and acute management of people with stroke, covering neurological, general medical and rehabilitation aspects;
- stroke specialist rehabilitation staff.

E An acute stroke unit should provide:

- specialist medical staff trained in the acute management of people with stroke;
- specialist nursing staff trained in the acute management of people with stroke, covering neurological, general medical and rehabilitation aspects;
- stroke specialist rehabilitation staff.

Table 1.21: Specialist consultant led ward rounds (type 1 beds)

Stroke consultant ward rounds (type 1 beds) (Q2.3)	**National 2016** Type 1 beds (73 sites) % (n)	**National 2019** Type 1 beds (86 sites) % (n)
Specialist consultant-led ward round at least once a day (7 days per week)	84% (61)	90% (77)

E Nurse Staffing

There has been a small but significant change in nursing skill mix on HASUs since 2016 – fewer registered nurses, being replaced by an increase in unregistered staff. This may not have important consequences as long as competencies are maintained – and the number of swallow-trained nurses has remained constant over that period at a median of 2.5 per 10 HASU beds on weekdays and weekends. This is particularly important given recent research demonstrating that the relation between mortality and nursing numbers on stroke units is principally mediated through the number of swallow-trained nurses (Paley et al, 2018).

Table 1.22 Median number of nurses on duty at 10am trained in swallow screening

Nurses trained in swallow screening usually on duty at 10am (2.5(i) & 2.17(i)) Median (Interquartile range)			Total stroke units	Type 1 beds	Type 3 beds
			2014 (183 sites)	**2014** (75 sites)	**2014** (109 sites)
			2016 (178 sites)	**2016** (73 sites)	**2016** (105 sites)
			2019 (169 sites)	**2019** (86 sites)	**2019** (81 sites)
Weekdays	**2014**	Number per 10 beds	1.4 (0.9-1.9)	2.5 (1.7-3.3)	1.4 (0.9-1.9)
	2016	Number per 10 beds	1.5 (0.9-1.9)	2.5 (2.1-4.0)	1.6 (0.9-1.8)
	2019	Number per 10 beds	1.5 (1.1-2.1)	2.5 (2.0-4.3)	1.6 (0.9-1.8)
Saturdays	**2014**	Number per 10 beds	1.4 (0.8-1.7)	2.5 (1.7-3.3)	1.3 (0.8-1.8)
	2016	Number per 10 beds	1.3 (0.8-1.7)	2.5 (1.7-3.8)	1.4 (0.8-1.7)
	2019	Number per 10 beds	1.4 (0.9-2.0)	2.5 (2.0-4.0)	1.4 (0.8-1.8)
Sundays / Bank Holidays	**2014**	Number per 10 beds	1.3 (0.8-1.7)	2.5 (1.7-3.3)	1.3 (0.8-1.8)
	2016	Number per 10 beds	1.3 (0.8-1.7)	2.5 (1.7-3.8)	1.4 (0.8-1.7)
	2019	Number per 10 beds	1.4 (0.9-2.0)	2.5 (2.0-4.0)	1.4 (0.8-1.8)

Unregistered nurses *(Have not undertaken nurse training, they are often referred to as nursing assistant or healthcare assistant, but this is not a 'registered qualification').*

Table 1.23 Total establishment of whole time equivalents (WTE) for unregistered nurses

Total establishment of nurses (bands 1-4) for all stroke beds Median (IQR*)			Total stroke unit beds	Type 1 beds	Type 2 beds	Type 3 beds
			2014 (183 sites)	**2014** (75 sites)	**2014** (99 sites)	**2014** (109 sites)
			2016 (178 sites)	**2016** (73 sites)	**2016** (92 sites)	**2016** (105 sites)
			2019 (169 sites)	**2019** (86 sites)	**2019** (105 sites)	**2019** (81 sites)
Band 2 Nurses	**2014**	Total WTE of nurses	12.1 (8.6-17.5)	3.5 (1.5-7.0)	10.0 (6.0-13.0)	10.8 (6.1-14.0)
		WTE per 10 beds	4.6 (3.7-5.8)	5.3 (1.6-6.7)	4.6 (3.7-5.7)	4.8 (3.6-6.2)
	2016	Total WTE of nurses	13.7 (8.2-18.9)	3.0 (1.0-7.2)	12.1 (7.5-16.1)	11.5 (6.2-15.4)
		WTE per 10 beds	5.2 (3.8-6.5)	4.7 (1.7-6.8)	5.4 (4.2-7.4)	5.1 (3.7-6.4)
	2019	Total WTE of nurses	15.7 (10.0-19.8)	3.6 (0.7-4.0)	13.6 (9.0-17.2)	12.3 (6.8-16.4)
		WTE per 10 beds	5.7 (4.5-7.1)	4.7 (0.2-6.6)	6 (4.1-8.1)	5.6 (4.5-6.8)
Band 3 Nurses	**2014**	Total WTE of nurses	1.0 (0.0-3.0)	0.0 (0.0-1.0)	0.0 (0.0-2.0)	1.0 (0.0-3.0)
		WTE per 10 beds	0.4 (0.0-1.2)	0.0 (0.0-0.9)	0.0 (0.0-1.1)	0.5 (0.0-1.2)
	2016	Total WTE of nurses	0.9 (0.0-3.0)	0.0 (0.0-0.8)	0.0 (0.0-3.0)	0.6 (0.0-2.0)
		WTE per 10 beds	0.3 (0.0-1.2)	0.0 (0.0-1.1)	0.0 (0.0-1.3)	0.3 (0.0-1.0)
	2019	Total WTE of nurses	1.0 (0.0-3.7)	0.0 (0.0-1.1)	0.9 (0.0-3.0)	0.8 (0.0-3.0)
		WTE per 10 beds	0.4 (0.0-1.5)	0.0 (0.0-1.6)	0.4 (0-1.6)	0.4 (0-1.4)
Band 4 Nurses	**2014**	Total WTE of nurses	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.0 (0.0-0.0)
		WTE per 10 beds	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.0 (0.0-0.0)
	2016	Total WTE of nurses	0.0 (0.0-1.0)	0.0 (0.0-0.6)	0.0 (0.0-0.0)	0.0 (0.0-0.8)
		WTE per 10 beds	0.0 (0.0-0.3)	0.0 (0.0-0.7)	0.0 (0.0-0.0)	0.0 (0.0-0.3)
	2019	Total WTE of nurses	0.0 (0.0-1.0)	0.0 (0.0-0.7)	0.0 (0.0-1.0)	0.0 (0.0-1.0)
		WTE per 10 beds	0.0 (0.0-0.5)	0.0 (0.0-0.7)	0.0 (0.0-0.4)	0.0 (0.0-0.4)

** Interquartile range*

Registered nurses *(Have trained as a nurse and been awarded a degree (or previously a diploma) in nursing and are registered as a practising nurse with the UK Central Council of Nursing and Midwifery)*

Table 1.24: Total establishment of whole time equivalents (WTE) for registered nurses

Total establishment of nurses (bands 5-8c) for all stroke beds (Q2.7, 2.12 & 2.19) Median (IQR*)			Total stroke unit beds	Type 1 beds	Type 2 beds	Type 3 beds
			2014 (183 sites)	**2014** (75 sites)	**2014** (99 sites)	**2014** (109 sites)
			2016 (178 sites)	**2016** (73 sites)	**2016** (92 sites)	**2016** (105 sites)
			2019 (169 sites)	**2019** (86 sites)	**2019** (105 sites)	**2019** (81 sites)
Band 5 Nurses	**2014**	Total WTE of nurses	18.0 (13.3-27.2)	9.8 (4.5-14.4)	14.0 (10.3-17.8)	14.8 (10.9-18.0)
		WTE per 10 beds	7.3 (5.9-8.7)	10.3 (7.5-16.5)	6.8 (5.2-7.9)	6.9 (5.8-8.2)
	2016	Total WTE of nurses	18.4 (12.8-28.9)	7.9 (4.6-13.0)	14.3 (11.3-20.1)	14.2 (10.4-18.7)
		WTE per 10 beds	7.3 (5.9-8.8)	10.7 (7.6-14.8)	7.0 (5.7-8.0)	7.0 (5.6-8.1)
	2019	Total WTE of nurses	17.7 (12.4-24.6)	7.0 (4.1-13.2)	12.9 (9.7-17.0)	14.1 (9.0-18.3)
		WTE per 10 beds	7.0 (5.6-8.2)	9.1 (6.0-13.9)	6.5 (4.8-7.8)	6.6 (5.2-7.6)
Band 6 Nurses	**2014**	Total WTE of nurses	3.0 (2.0-6.0)	2.5 (0.7-5.4)	2.0 (1.0-3.0)	2.0 (1.0-4.0)
		WTE per 10 beds	1.2 (0.7-2.0)	2.7 (0.9-6.7)	0.9 (0.6-1.3)	0.9 (0.6-1.7)
	2016	Total WTE of nurses	4.4 (2.0-7.7)	3.0 (1.0-6.6)	2.8 (2.0-4.0)	3.0 (2.0-5.0)
		WTE per 10 beds	1.7 (1.0-2.5)	4.2 (1.7-7.4)	1.3 (0.8-1.7)	1.3 (0.8-2.2)
	2019	Total WTE of nurses	5.3 (3.0-8.8)	3.4 (2.0-6.0)	3.0 (2.0-4.1)	3.8 (2.0-6.0)
		WTE per 10 beds	1.9 (1.4-2.9)	3.8 (2.5-6.9)	1.4 (0.9-2.0)	1.7 (1.1-2.9)
Band 7 Nurses	**2014**	Total WTE of nurses	1.0 (1.0-2.0)	0.5 (0.0-1.0)	1.0 (0.5-1.0)	1.0 (0.8-1.0)
		WTE per 10 beds	0.4 (0.4-0.6)	0.6 (0.0-1.3)	0.4 (0.3-0.5)	0.4 (0.3-0.6)
	2016	Total WTE of nurses	2.0 (1.0-2.4)	1.0 (0.4-1.4)	1.0 (1.0-1.4)	1.0 (1.0-2.0)
		WTE per 10 beds	0.6 (0.4-0.9)	1.1 (0.5-1.8)	0.5 (0.4-0.6)	0.6 (0.4-1.0)
	2019	Total WTE of nurses	1.5 (1.0-2.0)	1.0 (0.2-1.4)	1.0 (1.0-1.0)	1.0 (0.9-1.5)
		WTE per 10 beds	0.5 (0.4-0.8)	0.8 (0.4-1.7)	0.5 (0.4-0.6)	0.5 (0.3-0.7)
Band 8a Nurses	**2014**	Total WTE of nurses	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.0 (0.0-0.0)
		WTE per 10 beds	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.0 (0.0-0.0)
	2016	Total WTE of nurses	0.0 (0.0-0.5)	0.0 (0.0-0.0)	0.0 (0.0-0.1)	0.0 (0.0-0.1)
		WTE per 10 beds	0.0 (0.0-0.1)	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.0 (0.0-0.1)
	2019	Total WTE of nurses	0.0 (0.0-0.8)	0.0 (0.0-0.2)	0.0 (0.0-0.3)	0.0 (0.0-0.2)
		WTE per 10 beds	0.0 (0.0-0.2)	0.0 (0.0-0.3)	0.0 (0.0-0.1)	0.0 (0.0-0.1)

** Interquartile range*

F Consultant Workforce and Training

Training in the medical subspecialty of stroke medicine is in serious decline, with a 21% fall in the number of sites providing an accredited training programme in stroke medicine (2016: 56 sites; 2019: 44 sites). This will compound the increasing difficulty in recruitment into consultant posts in

stroke medicine; the proportion of sites with at least one vacant consultant post has increased from 40% in 2016 to 48% this year, with posts lying vacant for a median of 12 months. Future projections for the senior medical workforce in stroke medicine have recently been updated by the Getting It Right First Time (GIRFT) programme in conjunction with the British Association of Stroke Physicians (BASP, 2019) and this current vacancy rate must provoke serious concern regarding the sustainability of many stroke services now and in the near future.

Table 1.25 Consultant workforce, unfilled, existing and planned posts

Site has at least one accredited specialist registrar in post for stroke speciality training (Q8.1)		**National 2014 (183 sites) % (n)**	**National 2016 (178 sites) % (n)**	**National 2019 (169 sites) % (n)**
Yes		29% (53)	31% (56)	26% (44)
Unfilled stroke consultant posts (Q8.4)		**National 2014 (183 sites) % (n)**	**National 2016 (178 sites) % (n)**	**National 2019 (169 sites) % (n)**
Number of sites with any **unfilled stroke consultant** posts		26% (48)	40% (72)	48% (81)
If yes:		National 2014 (48 sites)	National 2016 (72 sites)	National 2019 (81 sites)
Number of **programmed activities** (PAs) these **posts cover** (Q8.4a)	Median (IQR), Total	10 (6-11), 454	10 (8.5-11.9), 804	10 (8.0-12.0), 950
Number of **months** these **posts** have been **funded but unfilled** (Q8.4b)	Median (IQR)	8 (2-19)	15 (6-24)	12 (5-24)
Existing stroke consultant posts (Q8.5)		**National 2014 (183 sites)**	**National 2016 (178 sites)**	**National 2019 (169 sites)**
Number of **programmed activities** (PAs) for **stroke consultant physicians per site**	Median (IQR), Total	22 (14-34) 4671	22 (13-41) 5122	28.2 (20-48) 5,794
Number of consultants **(individuals) programmed activities** (PAs) are **divided between** (Q8.5a)	Median (IQR), Total	3 (2-4) 656	3 (2-5) 676	4 (2-6) 730
Number of **programmed activities** (PAs) which are **allocated to direct clinical care** (DCC) (Q8.5b)	Median (IQR), Total	17 (10-27) 3588	19 (11-31) 3907	20 (14-35) 4,274
Future planned stroke consultant posts (Q8.6)		**National 2014 (183 sites) % (n)**	**National 2016 (178 sites) % (n)**	**National 2019 (169 sites) % (n)**
Number of sites with **new/additional** posts for stroke consultant physicians		48% (87)	46% (81)	41% (70)
If yes:		National 2014 (87 sites)	National 2016 (81 sites)	National 2019 (70 sites)
Number of **programmed activities** (PAs) planned for **new/additional** stroke consultant physicians (Q8.6)	Median (IQR), Total	(5-10) 829	0 (0-10) 881	0 (0-10) 938
Number of **new/additional consultants (individuals)** these programmed activities (PAs) are **divided between** (Q8.6a)	Median (IQR), Total	1 (1-2) 118	1 (1-2) 130	1 (1-2) 118
Number of **new/additional** programmed activities (PAs) **for direct clinical care** (DCC) for stroke (Q6.6(b))	Median (IQR), Total	7 (4-9) 653	7 (4-9) 670	8 (5.2-12) 676

G Intermittent Pneumatic Compression

Evidence-based practice in the prevention of deep vein thrombosis and pulmonary embolism has improved since 2016, with 98% of sites now reporting that intermittent pneumatic compression (IPC) is the first-choice preventative regimen (up from 80% in 2016). Oddly, three sites are still persisting with low molecular weight heparin as first choice, despite the evidence of lack of net benefit and contrary to expert recommendations.

2016 RCP National Clinical Guideline for Stroke, 5th Edition

3.13.1

A Patients with immobility after acute stroke should be offered intermittent pneumatic compression within 3 days of admission to hospital for the prevention of deep vein thrombosis. Treatment should be continuous for 30 days or until the patient is mobile or discharged, whichever is sooner.

Table 1.26: Treatment for preventing venous thromboembolism

First line treatment for preventing venous thromboembolism (VTE) (Q5.5)	National 2014 (183 sites) % (n)	National 2016 (178 sites) % (n)	National 2019 (169 sites) % (n)
Intermittent pneumatic compression device	42% (77)	80% (143)	98% (165)
Low molecular weight heparin	35% (64)	13% (24)	2% (3)
Short or long compression stockings	1% (1)	1% (1)	0% (0)
None of the above	22% (41)	6% (10)	1% (1)

Key Indicators by country

This section compares national figures for the organisation of stroke care in England, Wales and Northern Ireland at 3 June 2019.

Denominators vary within tables because of differing site characteristics. 169 is the total number of sites that participated in the audit in England (148), Wales (12), Northern Ireland (8) and Islands (1). There are 27 sites in England which do not provide care to patients in the first 72 hours. These sites are excluded from the analysis of measures relating to this phase of acute care.

The national column reflects the national figures including the results from the Isle of Man. However, the regional breakdowns relate to results from England, Wales and Northern Ireland only.

Table 1.27: Key Indicators summary by country

Key Indicator summary by country	National 2019 169 sites % (n)	England 148 sites % (n)	Wales 12 sites % (n)	Northern Ireland 8 sites % (n)
Total Key Indicators Achieved				
1	5% (8)	5% (8)	0	0
2	7% (12)	5% (8)	0	50% (4)
3	18% (31)	16% (23)	42% (5)	25% (2)
4	20% (33)	19% (28)	42% (5)	0
5	18% (30)	18% (27)	8% (1)	25% (2)
6	17% (28)	18% (27)	8% (1)	0
7	7% (11)	7% (11)	0	0
8	7% (11)	7% (11)	0	0
9	2% (4)	3% (4)	0	0
10	1% (1)	1% (1)	0	0

Post 72hrs sites receive points from KIs 3,4, and 6 from their main acute site

Table 1.28: Staffing/Workforce

Key Indicators by country	National 169 sites % (n)	England 148 sites % (n)	Wales 12 sites % (n)	Northern Ireland 8 sites % (n)
Key Indicator 1: Minimum establishment of band 6 and band 7 nurses per 10 beds	**58% (98)**	**59% (87)**	**50% (6)**	**50% (4)**
Band 6 nurses WTE per 10 beds (Median [IQR])	1.9 [1.4-2.9]	1.9 [1.4-2.9]	1.5 [1.2-2.3]	1.8 [1.4-2.4]
Band 7 nurses WTE per 10 beds (Median [IQR])	0.5 [0.4-0.8]	0.5 [0.4-0.8]	0.6 [0.5-0.9]	0.4 [0.3-0.7]
Key Indicator 2: Presence of at least 1 WTE qualified clinical psychologist to cover 30 stroke unit beds	**7% (12)**	**7% (11)**	**8% (1)**	**0% (0)**
Clinical psychologist WTE per 30 beds (qualified) (Median [IQR])	0.1 [0-0.3]	0.1 [0-0.4]	0 [0-0.4]	0 [0-0]

Table 1.29: 7-day working

Key Indicators by country		National 142 sites % (n)	England 121 sites % (n)	Wales 12 sites %(n)	Northern Ireland 8 sites % (n)
Key Indicator 3: Stroke specialist nurses (band 6 or above) available to undertake hyper-acute assessments of suspected stroke patients in A&E Out of Hours		**71% (101)**	**77% (93)**	**42% (5)**	**25% (2)**
Key Indicator 4: Minimum number of nurses on duty at 10am weekends		**30% (42)**	**29% (35)**	**25% (3)**	**50% (4)**
Nurses per 10 type 1 beds 10am Saturdays (Median [IQR])		3.3 [2.5-4.8]	3.1 [2.4-4.3]	4 [2.8-5]	5 [4.4-7.5]
Nurses per 10 type 1 beds 10am Sundays (Median [IQR])		3.3 [2.5-4.8]	3.1 [2.4-4.3]	4 [2.8-5]	5 [4.4-7.5]
Nurses per 10 type 3 beds 10am Saturdays (Median [IQR])		1.7 [1.4-2.1]	1.8 [1.4-2.1]	1.7 [1.6-1.7]	2.1 [2.1-2.5]
Nurses per 10 type 3 beds 10am Sundays (Median [IQR])		1.8 [1.5-2.1]	1.8 [1.4-2.1]	1.7 [1.6-1.7]	2.1 [2.1-2.5]
Key Indicator 5: At least two types of therapy available 7 days a week		**National 169 sites % (n)**	**England 148 sites % (n)**	**Wales 12 sites % (n)**	**Northern Ireland 8 sites % (n)**
		38% (65)	**42% (62)**	**25% (3)**	**0% (0)**
(e) Occupational Therapy (qualified) available 5, 6 or 7 days per week	5 days	42% (71/169)	37% (55/148)	67% (8/12)	88% (7/8)
	6 days	20% (34/169)	22% (32/148)	8% (1/12)	12% (1/8)
	7 days	38% (64/169)	41% (61/148)	25% (3/12)	

(g) Physiotherapy (qualified) available 5, 6 or 7 days per week	5 days	38% (64/169)	34% (50/148)	58% (7/12)	75% (6/8)
	6 days	16% (27/169)	17% (25/148)	8% (1/12)	12% (1/8)
	7 days	46% (78/169)	49% (73/148)	33% (4/12)	12% (1/8)
(i) Speech & Language Therapy (qualified) available 5, 6 or 7 days per week		**National 165 sites % (n)**	**England 147 sites % (n)**	**Wales 12 sites % (n)**	**Northern Ireland 5 sites % (n)**
	5 days	78% (129)	78% (115)	83% (10)	60% (3)
	6 days	12% (19)	10% (15)	17% (2)	40% (2)
	7 days	10% (17)	12% (17)		

Table 1.30: Access to specialist treatment and support

Key Indicators by country	National 142 sites % (n)	England 121 sites % (n)	Wales 12 sites %(n)	Northern Ireland 8 sites % (n)
Key Indicator 6: Site pre-alert for all stroke patients and the member of staff called is a stroke specialist nurse, consultant or junior doctor	**38% (54)**	**40% (48)**	**33% (4)**	**25% (2)**
1.10. Do the stroke team receive a pre-alert (telephone call) from your ambulance crews for suspected stroke patients?				
Thrombolysis candidates only				
Yes	80% (113)	78% (94)	92% (11)	88% (7)
No	11% (16)	12% (14)	8% (1)	12% (1)
Sometimes	9% (13)	11% (13)	0% (0)	0% (0)
All FAST positive				
Yes	69% (98)	66% (80)	75% (9)	100% (8)
No	11% (15)	12% (15)	0% (0)	0% (0)
Sometimes	20% (29)	21% (26)	25% (3)	0% (0)
All other suspected strokes				
Yes	37% (52)	36% (44)	25% (3)	50% (4)
No	15% (22)	17% (21)	8% (1)	0% (0)
Sometimes	48% (68)	46% (56)	67% (8)	50% (4)
1.11. If the stroke team receive a pre-alert, who is the call usually made to?				
Stroke Specialist Nurse	44% (63)	47% (57)	33% (4)	25% (2)
Stroke Junior Doctor on call	13% (19)	12% (14)	25% (3)	25% (2)
Stroke Consultant on call	12% (17)	10% (12)	25% (3)	25% (2)

Key Indicator 7: Access to a specialist (stroke/neurological specific) early supported discharge (ESD) team and coverage of at least 66% of patients who have access to at least one of the teams	National 169 sites % (n)	England 148 sites % (n)	Wales 12 sites % (n)	Northern Ireland 8 sites % (n)
	63% (107)	**68% (101)**	**17% (2)**	**50% (4)**
6.1. Do you have access to at least one stroke/neurology specific early supported discharge multidisciplinary team?	85% (143)	91% (135)	33% (4)	50% (4)
6.1 (b) What percentage of your patients has access to at least one of these teams if needed? (% [IQR])	100 [67-100]	100 [67-100]	55 [31.2-77.5]	100 [100-100]

Table 1.31: Patient and carer engagement

Key Indicators by country	National 169 sites % (n)	England 148 sites % (n)	Wales 12 sites % (n)	Northern Ireland 8 sites % (n)
Key Indicator 8: Formal survey undertaken seeking patient/carer views on stroke services	**56% (95)**	**54% (80)**	**83% (10)**	**50% (4)**
9.7. How often is there a formal survey seeking patient/carer views on stroke services? (This does not include the Friends and Family Test)				
Never	21% (35)	23% (34)	8% (1)	0% (0)
Less than once a year	23% (39)	23% (34)	8% (1)	50% (4)
1-2 times a year	20% (33)	20% (29)	17% (2)	25% (2)
3-4 times a year	4% (6)	3% (4)	8% (1)	12% (1)
More than 4 times a year	8% (14)	9% (14)	0% (0)	0% (0)
Continuous (every patient):	25% (42)	22% (33)	58% (7)	12% (1)

Table 1.32: TIA Service

Key Indicators by country	National 169 sites % (n)	England 148 sites % (n)	Wales 12 sites % (n)	Northern Ireland 8 sites % (n)
Key Indicator 9: First line of brain imaging for TIA patients is MRI and outpatient TIA evaluation is at least next working day	**33% (56)**	**37% (55)**	**0% (0)**	**12% (1)**
4.10. Which imaging modality do you most frequently use in your neurovascular clinic for suspected TIAs?				
(a) First line brain imaging				
Computed Tomography	50% (85)	47% (69)	100% (12)	50% (4)
Magnetic Resonance Imaging	45% (76)	49% (72)	0% (0)	38% (3)
Rarely image TIAs	5% (8)	5% (7)	0% (0)	12% (1)
7.11. Within what timescale can you see, investigate and initiate treatment for ALL your TIA patients?				

Outpatient	99% (160/162)	99% (140/142)	100% (12/12)	100% (7/7)
Outpatient timescale				
	National 160 sites % (n)	**England 140 sites % (n)**	**Wales 12 sites % (n)**	**Northern Ireland 7 sites % (n)**
The same day (7 days a week)	31% (50)	36% (50)	0% (0)	0% (0)
The same day (5 days a week)	26% (41)	26% (36)	17% (2)	43% (3)
The next day:	14% (23)	14% (20)	17% (2)	14% (1)
The next weekday	8% (13)	6% (9)	25% (3)	14% (1)
Within a week	19% (31)	16% (23)	42% (5)	29% (2)
Within a month	1% (2)	1% (2)	0% (0)	0% (0)
Longer than a month	0% (0)	0% (0)	0% (0)	0% (0)

Table 1.33: Quality improvement and leadership

Key Indicators by country	**National 169 sites % (n)**	**England 148 sites % (n)**	**Wales 12 sites % (n)**	**Northern Ireland 8 sites % (n)**
Key Indicator 10: Follow-up of the results and recommendations is done by a chairman of clinical governance, non-executive on the board and executive on the board	**63% (106)**	**61% (91)**	**100% (12)**	**38% (3)**
9.1. What level of management takes responsibility for the follow-up of the results and recommendations of the Sentinel Stroke Audit?				
Executive on the Board	58% (98)	56% (83)	100% (12)	38% (3)
Non-executive on the Board	17% (28)	16% (23)	42% (5)	0% (0)
Chairman of Clinical Governance (or equivalent)	25% (43)	28% (41)	17% (2)	0% (0)

Getting It Right First Time (GIRFT)

The new questions collected for 'Getting it Right First Time' (GIRFT) are identified in Appendix 4 with a 'G'. The full national and site-level results for all these questions are available in the portfolio https://www.strokeaudit.org/results/Organisational.aspx

Glossary

6-month reviews	A review of a stroke patient's progress 6 months after their stroke. This review provides the opportunity to assess whether a patient's needs have been met, to have their progress reviewed and future goals set if further support is needed. By collecting this information about patient outcomes at six months SSNAP can look at: • changes in disability compared to discharge • where people have been discharged to (usual home or care home or change in place of residence) • unmet needs • mood and cognition, in particular identification of areas (sometimes called "silent symptoms") such as fatigue, concentration and mood disturbance which can affect adversely quality of life and return to work and normal activities • secondary prevention issues, for example blood pressure management and appropriate management of atrial fibrillation.
British Association of Stroke Physicians (BASP)	The British Association of Stroke Physicians (BASP) is a membership group with the aim to promote the advancement of Stroke Medicine within Great Britain.
Carer	A person (commonly the patient's spouse, a close relative or friend) who provides on-going, unpaid support and personal care at home.
Commissioners	Funding bodies of NHS services.
CT angiogram	Uses a CT scanner to produce detailed images of both blood vessels and tissues in various parts of the body.
CT scan	A CT scan (computerised tomography) of the head. A CT scan X-rays the body from many angles. The X-ray beams are detected by the scanner and analysed by a computer. The computer compiles the images into a picture of the body area being scanned. These images can be viewed on a monitor or reproduced as photographs.
Direct clinical care (DCC)	Refers to direct patient contact and/or management. DCC is work directly related to preventing, diagnosing or treating illness, including emergency work carried out during or arising from on-call work.
Getting It Right First Time (GIRFT)	Getting It Right First Time (GIRFT) is a national programme designed to improve medical care within the NHS by reducing unwarranted variations. By tackling variations in the way services are delivered across the NHS, and by sharing best practice between trusts, GIRFT identifies changes that will help improve care and patient outcomes, as well as delivering efficiencies such as the reduction of unnecessary procedures and cost savings. https://gettingitrightfirsttime.co.uk/.

Health Boards	These are Administrative units in Wales that plan, secure and deliver healthcare services in their areas. http://www.wales.nhs.uk/nhswalesaboutus/structure
Hyperacute Stroke Unit (HASU)	Some stroke services designate the most intensive treatment as hyperacute. This would be where patients are initially treated and usually for a short period of time (i.e. up to three days).
Intermittent pneumatic compression (IPC) device	A medical device designed to improve venous circulation in the limbs of patients who are at risk of deep vein thrombosis (DVT) or pulmonary embolism (PE) after stroke.
Interquartile Range (IQR)	The interquartile range (IQR) is the range between 25th and 75th centile which is equivalent to the middle half of all values.
Ischaemic stroke	Ischaemic strokes are the most common type of stroke. They occur when a blood clot blocks the flow of blood and oxygen to the brain.
Intracerebral haemorrhage (ICH)	A type of stroke caused by bleeding within the brain tissue itself.
Median	The median is the middle point of a data set; half of the values are below this point, and half are above this point.
Large artery occlusive stroke	A stroke subtype where there is a blockage in one of the brain's larger blood supplying arteries such as the carotid or middle cerebral artery.
Long Term Plan	The NHS long Term Plan launched in January 2019. It is sets out a plan for the NHS to improve patient care and health outcomes in the future. https://www.longtermplan.nhs.uk/wp-content/uploads/2019/08/nhs-long-term-plan-version-1.2.pdf.
Magnetic resonance imaging (MRI)	Magnetic resonance imaging (MRI) is a type of scan that uses strong magnetic fields and radio waves to produce detailed images of the inside of the body.
Multi-disciplinary	A team or service which is composed of staff from different healthcare professions with specialist skills and expertise. The members work together to ensure patients receive comprehensive, coordinated treatment.
National Institutes of Health Stroke Scale (NIHSS)	A validated international tool used by healthcare professionals to objectively quantify (measure) the impairment caused by stroke.

National Clinical Guideline for Stroke (2016)	A National evidence based guideline for stroke care published by the Intercollegiate Working Party for Stroke fifth edition 2016 https://www.strokeaudit.org/Guideline/Guideline-Home.aspx
National Sentinel Stroke Audit	National stroke audit conducted between 1998 and 2010 which measured the organisation of stroke services (organisational audit) and the quality of stroke care for a group of patients (clinical audit) every two years. The National Sentinel Stroke Audit has been replaced by the new stroke audit SSNAP.
Neurovascular Clinic	An outpatient clinic for patients with transient ischaemic attacks (TIA) or minor stroke for further investigation.
Non-specialist community rehabilitation team (CRT)	A non-specialist team which treats other patients in addition to stroke and neurology patients in the community.
Organisational Audit	Audit of the service organisation, particularly relevant in stroke audit due to the evidence supporting organised stroke services.
Orthotics	Orthotists are the health professionals concerned with the application and manufacture of orthoses, devices which support or correct the function of a limb.
Orthoptists	The evaluation and nonsurgical treatment of visual disorders caused by imbalance of the eye muscles.
Out of hours	In hours is between 08.00-18.00 Monday to Friday. Out of hours is all days and times outside this range.
Per 10 (30) stroke beds	A method of calculating ratios of staff to every 10-stroke unit beds. The whole-time equivalents (WTE) for each staffing discipline in a service divided by the total number of beds used by stroke patients multiplied by 10. This enables comparison between services of different sizes. The same rule applies for per 30 beds in terms of Key Indicator 2 but multiplied by 30.
Podiatry	A specialism which looks at the diagnosis, medical and surgical treatment of disorders of the foot, ankle and lower extremity.
Pre-Alert	Information given to a receiving hospital about a critically ill or injured patient's condition.

Programmed activities (sessions)	A 4-hour unit of time (one half-day), 10 of which comprise a consultant's work week. In contrast to supporting professional activities, programmed activities are dedicated to direct clinical care.
Secondary Prevention	Measures to prevent recurrence of the same illness.
Sentinel Stroke National Audit Programme (SSNAP)	National Stroke Audit run by the Royal College of Physicians, London. In addition to the acute organisational audit reported on in this document, SSNAP prospectively collects a minimum data set for every stroke patient covering acute care including rehabilitation and 6-month follow up.
Sessions	A term used to describe a junior doctor's time. One session represents half a day.
Service centralisation	The reorganisation of many stroke services into fewer, highly specialised hospitals that focuses on acute stroke care. For example, London and Greater Manchester have a centralised stroke service which means a stroke patient will be taken to a dedicated specialist stroke unit rather than their nearest hospital.
Specialist community rehabilitation team (CRT)	A specialist community rehabilitation team refers to a stroke specific service delivered by specialist professionals within a multi-disciplinary team working in the community delivering rehabilitation services within a patient's home. A community rehabilitation team (CRT) will cater for patients following inpatient rehabilitation or transfer from early supported discharge (ESD).
Specialist early supported discharge (ESD) Team	An early supported discharge team refers a stroke specific service delivered by specialist professionals within a multi-disciplinary team to provide rehabilitation and support in a community setting with the aim of reducing the duration of hospital care for stroke patients and enabling them to return home quicker.
Stroke specialist senior nurses	Stroke specialist nurses are nurses at band 6 level or above.
Swallow screening	Swallow screening refers to a process which broadly identifies the safety of a patient's swallow ability. This screening process, which may be performed by any member of the team trained to do this, acts to establish whether the patient requires further formal assessment regarding the patient's ability to swallow (either fluids or solid foods).
Thrombectomy/ mechanical thrombectomy/ intra-arterial treatment	The surgical removal of a thrombus (blood clot) from a blood vessel.

Thrombolysis	The use of drugs to break up a blood clot.
Transient ischaemic attack (TIA)	A transient ischaemic attack is less severe than a stroke in that all the symptoms disappear within a day (and often last for less than half an hour). It is also referred to as 'mini stroke'.
Trusts	In the context of the UK's National Health Service (NHS), trusts are organisational units, e.g. hospital trusts, community trusts, primary care trusts or combinations thereof. In this report it usually refers to hospitals.
Type 1 beds	Stroke unit beds solely for patients in first 72 hours after stroke.
Type 2 beds	Stroke unit beds solely for patients beyond 72 hours after stroke.
Type 3 beds	Stroke unit beds used for both pre and post-72-hour care.
Urgent and Emergency Care (NHS England) standards	A new set of guidance produced by NHS England to assist NHS Trusts throughout England in running their urgent and emergency care services. https://www.england.nhs.uk/wp-content/uploads/2015/06/trans-uec.pdf.
Venous thromboembolism	The formation of blood clots in the vein.
Whole time equivalent (WTE)	The whole time equivalent (WTE) of staff is the number of hours staffing disciplines are contracted to work within a typical working week. For example, a WTE number of 1.0 means that the person is equivalent to a full-time worker (and works e.g. 37.5 hours per week); while a WTE of 0.5 signals that the worker is half-time (and works 18.75 hours). This should not be confused with the number of individuals, which is the number of people (bodies) a service has to deliver those hours.

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Appendix 1: Full introduction and Methodology

Introduction

This report presents the results of the Sentinel Stroke National Audit Programme (SSNAP) 2019 Acute Organisational Audit. It describes the organisation of stroke care in England, Wales and Northern Ireland as of 3 June 2019 and includes all acutely admitting hospitals. It provides continuity from the 2012, 2014 and 2016 acute organisational audits and previous biennial NSSA audits. The audit is based on standards agreed by representatives of the Intercollegiate Stroke Working Party (ICSWP).

Its questions are well understood and the majority are comparable with the 2012 and 2014 audits. SSNAP also comprises of the SSNAP clinical audit which has prospectively collected a minimum dataset for every stroke patient, including acute care, rehabilitation, 6-month follow up, and outcome measures since December 2012. As a result of this SSNAP is now the single source of stroke data for England, Wales and Northern Ireland. The organisational audit complements the continuous clinical audit and results from the SSNAP clinical audit are available to view using the results portal (http://www.strokeaudit.org/results). At the time of submitting data for this organisational audit, 87,635 patient records had been analysed for stroke patients admitted between April 2018 and March 2019.

The aims of the SSNAP Acute Organisational Audit

1. To audit against the RCP National Clinical Guideline for Stroke
2. To enable trusts to benchmark the quality of their stroke services nationally and regionally
3. To measure the extent to which the recommendations made in the 2016 acute organisational audit have been implemented
4. To measure the rate of change in stroke service organisation since the implementation of National Stroke Strategies and publication of the National Audit Office Report

Organisation of the Audit

Data were collected at site level within trusts (or Health Boards in Wales) using a standardised method. Clinical involvement and supervision at team level is provided by a lead clinician in each hospital who has overall responsibility for data quality. The audit is guided by a multi-disciplinary steering group responsible for the Sentinel Stroke National Audit Programme – the Intercollegiate Stroke Working Party (ICSWP).

Details of membership of the ICSWP can be found in Appendix 2.

Availability of this Report in the Public Domain

Participating hospitals (sites) will receive individual results portfolios and a national report in September 2019. These portfolios will include all data items for the named hospitals and performance against all Key Indicators from the acute organisational audit. A full results portfolio and national report will be made available to the wider NHS, including NHS England and the Care Quality Commission in England, NHS Wales (Welsh Assembly Government) and the Department of Health, Social Services and Public Safety in Northern Ireland by October 2019. All named site results

will be published in December 2019 in line with the transparency agenda subject to HQIP's standard reporting process.

Participation

There is 100% participation of eligible trusts (137). These trusts covered 169 sites which contained a total of 183 acute hospitals with 160 in England, 14 in Wales, 8 in Northern Ireland and 1 in the Isle of Man

Methods

Eligibility and Recruitment

All sites that routinely treat patients within 7 days of stroke were eligible to participate. Pre 2012, only hospitals which directly admitted acute stroke patients were eligible, but due to the centralisation of stroke services and the establishment of a hyperacute model of stroke care in different parts of the country this was changed in 2012. Registration forms were submitted by each site which confirmed service configuration and details of the lead clinician and clinical audit lead. 100% of eligible sites were recruited and participated in the 2019 audit. Due to changes in service configurations and trust mergers the total number of sites has changed from 178 to 169 since the 2016 organisational audit.

Standards in the Audit

A number of changes were made to the 2016 audit proforma (Appendix 4) from the 2016 audit in order to investigate some additional areas.

Data Collection Tool

Data were collected at site level which can be either the only site within a trust or several sites within a trust (Health Board in Wales) using a standardised method. Clinical involvement and supervision at team level is provided by a lead clinician in each hospital with overall responsibility for data quality. Data were collected using a web-based tool accessible via the internet. Security and confidentiality were maintained through the use of hospital codes and high data quality was ensured through the use of built in validations which prevented illogical data being entered. All sites were asked to export and check their data before final sign off on 5 July 2019. No changes to the data were possible after this point.

Each participating site was provided with a standardised help booklet containing data definitions and clarifications and this was context specific. These helpnotes were also available within the web-based proforma itself. A telephone and email helpdesk was provided to answer any individual queries. As this is a snapshot audit, sites were asked to reflect their service as of 3 June 2019.

Evidence Based Audit

The acute organisational audit measures the structure of acute stroke services. It is evidence-based using standards and evidence from sources including the RCP National Clinical Guideline for Stroke, 4th edition, Clinical Commissioning Group Outcome Indicator Set (CCG OIS) and the NICE Quality Standards.

Key Indicators of Acute Stroke Organisation

In order to future proof the acute organisational audit SSNAP has invested existing resources to streamline its data collection, analysis and reporting, ensuring future efficiencies in result dissemination. Therefore, unlike previous years, SSNAP has not provided individual scoring and banding of sites. Instead, the domains and Key Indicators from the 2016 audit as well as recent research and evidence have been used as a guide to identify 10 Key Indicators of acute stroke organisation. Participating sites have been measured against specific criteria for each of these 10 Key Indicators. As some questions have changed not all Key Indicators from the 2016 acute organisational audit are directly comparable to the 2019 audit.

Individual site level result portfolios have been made available to participating sites. Each includes site specific results for the 10 Key Indicators of acute stroke organisation and all data items are benchmarked against national averages.

Standards

The current standards against which acute stroke services are compared are outlined throughout the report. They include the new 10 Key Indicator standards (blue boxes), the updated NICE Quality Standards (green boxes) and the RCP Guidelines for Stroke (orange boxes). Some of the acute criteria against which hospitals were measured in 2016 have been incorporated into the results portfolio.

Definitions

Definition of a 'Site'

Lead clinicians were asked to collect data on the basis of a unified service typically within a trust. For most trusts the 'site' was the trust. For some trusts there were several 'sites' each offering a discrete service. A site may include several hospitals.

Please note in this report 'trusts' is used as a generic term; however, it is acknowledged that in Wales, these are Health Boards.

Definition of a 'Stroke Unit'

The definition used for a stroke unit (and used in this audit) is: Stroke unit - a multi-disciplinary team including specialist nursing staff based in a discrete ward which is geographically defined and has been designated for stroke patients.

There are three categories of stroke unit beds used at different parts of the care pathway which are referenced in this report:

Type 1 beds - used solely used for patients in the first 72 hours after stroke
Type 2 beds - solely used for patients beyond 72 hours after stroke
Type 3 beds - beds used for both the first 72 hours of care and beyond

How to Read this Report

This report presents national level data for many important aspects of the organisation of stroke services. National results are presented as percentages or summarised by the median. The median is

the middle point of the data where 50% of the values lie on either side. Ratios of staffing numbers per 10 stroke unit beds are given rather than staffing numbers per stroke unit (SU) to allow comparison to national standards.

Denominators

It is important to note that denominators vary throughout this report depending on the number of hospitals to which the analyses relate. To illustrate, denominators can include all sites which participated (169), sites with type 1 beds (86), sites with type two beds (105) and sites with type three beds (81).

In addition, there are 2 sites that have patients referred to them for intra-arterial treatment; however, their participation in SSNAP is confined only to submitting data on the provision of thrombectomy. These two sites have submitted data on their provision of thrombectomy only. Therefore, in these instances the denominator will be 171.

Relationships between the acute organisational audit and the SSNAP clinical audit

The SSNAP clinical audit prospectively measures the processes of stroke care for every patient through the longitudinal clinical audit and the acute organisational audit is a component of SSNAP that measures the quality of acute stroke services.

Presentation of Results

Key aspects of acute stroke care organisation are addressed, including each of the 10 Key Indicators for the audit. There are comparisons with the 2014 and 2016 acute organisational audit (shown in the dark and light grey sections of data tables) and the SSNAP clinical audit where appropriate. Where possible throughout the report results are placed in the context of clinical processes for patients and national standards and guidelines (green and peach boxes). Clinical commentary is also given throughout.

Appendix 2: Intercollegiate Stroke Working Party – Membership

Chair

Professor Martin James, Professor of Stroke Medicine, Clinical Director of King's College Stroke Programme

Associate Director from the Stroke Programme at King's College London

Dr Ajay Bhalla, Associate Clinical Director, King's College Stroke Programme; Consultant Stroke Physician at Guy's and St Thomas' NHS Foundation Trust

List of Members and the Organisations they Represent

Association of British Neurologists
Dr Gavin Young, Consultant Neurologist, The James Cook University Hospital, South Tees Hospitals NHS Foundation Trust

British and Irish Orthoptic Society
Professor Fiona Rowe, Professor in Orthoptics, University of Liverpool

British Association of Stroke Physicians
Professor Thompson Robinson, Professor of Stroke Medicine, University of Leicester

British Dietetic Association
Mr Alex Lang, Guy's and St Thomas' NHS Foundation Trust

British Geriatrics Society
Professor Helen Rodgers, Professor of Stroke Care, Newcastle University

British Psychological Society
Dr Shirley Thomas, Associate Professor in Rehabilitation Psychology, University of Nottingham
Dr Viki Teggart, Clinical Neuropsychologist, Clinical Neuropsychologist, Greater Manchester Mental Health NHS Foundation Trust

British Society of Neuroradiologists
Dr Andrew Clifton, Interventional Neuroradiologist, St George's University Hospitals NHS Foundation Trust

British Society of Rehabilitation Medicine/Society for Research in Rehabilitation
Professor Derick Wade, Consultant in Rehabilitation Medicine, The Oxford Centre for Enablement

College of Paramedics
Mr Joseph Dent, Advanced Practitioner for Stroke, Salford Royal NHS Foundation Trust

Getting It Right First Time (GIRFT)
Dr David Hargroves, Joint Clinical Lead for Stroke, Getting It Right First Time
Dr Deborah Lowe, Joint Clinical Lead for Stroke, Getting It Right First Time

GP Member
Dr Iain Marshall, GP Partner, Greyswood Practice

Health Economics Advice
Professor Anita Patel, Independent Health Economics Expert/Honorary Professor, Queen Mary University of London

Healthcare Quality Improvement Partnership (HQIP)
Mr Mirek Skrypak, Associate Director for Quality and Development

Informatics Advice
Dr Andrew Hill, Consultant Stroke Physician, St Helens and Knowsley NHS Teaching Hospital

King's College London
Professor Charles Wolfe, Head of School, School of Population Health and Environmental Sciences
Dr Walter Muruet, Clinical Research Fellow

Patient representatives
Mr Robert Norbury
Ms Marney Williams
Mr Stephen Simpson

NIMAST (Northern Ireland Multidisciplinary Association of Stroke Teams)
Dr Patricia Gordon, Chair, NIMAST
Ms Nicola Moran, Website Liaison, NIMAST

Professor of Community Rehabilitation
Emeritus Professor Pam Enderby, Professor of Community Rehabilitation, The University of Sheffield

Royal College of Nursing
Dr Gill Cluckie, Stroke Nurse Consultant, St George's University Hospitals NHS Foundation Trust
Dr Ismalia de Sousa, Clinical Nurse Specialist in Stroke, Imperial College Healthcare NHS Trust

Royal College of Occupational Therapists and Special Section Neurological Practice
Professor Avril Drummond, Professor of Healthcare Research, University of Nottingham
Ms Louise Clark, Head of Occupational Therapy/AHP Lead for Stroke Services, Dorset County Hospital NHS Foundation Trust

Royal College of Radiologists
Professor Philip White, Hon Consultant Neuroradiologist, Newcastle Upon Tyne Hospitals NHS Foundation Trust

Royal College of Speech & Language Therapists
Professor Sue Pownall, Head of Speech & Language Therapy, Sheffield Teaching Hospitals NHS Foundation Trust

Stroke Association
Mrs Juliet Bouverie, Chief Executive, Stroke Association
Mr Mark MacDonald, Deputy Director - Policy and Influencing, Stroke Association

Welsh Government Stroke Implementation
Dr Phil Jones, Clinical Lead for Wales, Hywel Dda University Health Board

Appendix 3: List of Participating Hospitals and Trusts by Region

Region	Site Name	Hospital(s)
London	Barking, Havering and Redbridge University Hospitals NHS Trust	Queens Hospital Romford
	Barts Health NHS Trust (Newham University Hospital)	Newham General Hospital
	Barts Health NHS Trust (Whipps Cross University Hospital)	Whipps Cross University Hospital
	Barts Health NHS Trust (Royal London Hospital)	Royal London Hospital
	Chelsea and Westminster Hospital NHS Foundation Trust	Chelsea and Westminster Hospital
	Chelsea and Westminster Hospital NHS Foundation Trust (West Middlesex University Hospital)	West Middlesex University Hospital
	Croydon Health Services NHS Trust	Croydon University Hospital
	Epsom and St Helier University Hospitals NHS Trust (St Helier Hospital)	St Helier Hospital
	Guy's and St Thomas' Hospital NHS Foundation Trust	St Thomas Hospital
	Hillingdon Hospitals NHS Foundation Trust	Hillingdon Hospital
	Homerton University Hospital NHS Foundation Trust	Homerton University Hospital
	Imperial College Healthcare NHS Trust	Charing Cross Hospital
	King's College Hospital NHS Foundation Trust (King's College Hospital)	King's College Hospital
	King's College Hospital NHS Foundation Trust (Princess Royal University Hospital)	Princess Royal University Hospital
	Kingston Hospital NHS Foundation Trust	Kingston Hospital
	Lewisham and Greenwich NHS Trust	University Hospital Lewisham
	London North West University Healthcare NHS Trust (Northwick Park Hospital)	Northwick Park Hospital
	North Middlesex University Hospital NHS Trust	North Middlesex Hospital
	Royal Free London NHS Foundation Trust (Royal Free Hospital)	Royal Free Hospital
	Royal Free London NHS Foundation Trust (Barnet General Hospital)	Barnet General Hospital
	St George's Healthcare NHS Foundation Trust	St George's Hospital
	University College London Hospitals NHS Foundation Trust	University College Hospital
East Midlands	Northampton General Hospital NHS Trust	Northampton General Hospital
	Nottingham University Hospitals NHS Trust (Nottingham City Hospital)	Nottingham City Hospital
	Sherwood Forest Hospitals NHS Foundation Trust	Kings Mill Hospital
	United Lincolnshire Hospitals NHS Trust (Pilgrim Hospital)	Pilgrim Hospital
	United Lincolnshire Hospitals NHS Trust (Lincoln County Hospital)	Lincoln County Hospital
	University Hospitals of Derby and Burton NHS Foundation Trust (Royal Derby Hospital)	Royal Derby Hospital
	University Hospitals of Leicester NHS Trust	Leicester Royal Infirmary
East of England	Basildon and Thurrock University Hospitals NHS Foundation Trust	Basildon University Hospital
	Bedford Hospital NHS Trust	Bedford Hospital
	Cambridge University Hospitals NHS Foundation Trust	Addenbrooke's Hospital
	East and North Hertfordshire NHS Trust	Lister Hospital
	East Suffolk and North Essex NHS Foundation Trust (Colchester General Hospital)	Colchester General Hospital
	East Suffolk and North Essex NHS Foundation Trust (Ipswich Hospital)	Ipswich Hospital
	James Paget University Hospitals NHS Foundation Trust	James Paget Hospital
	Luton and Dunstable University Hospital NHS Foundation Trust	Luton and Dunstable Hospital
	Mid Essex Hospital Services NHS Trust	Broomfield Hospital

Region	Site Name	Hospital(s)
East of England	Norfolk and Norwich University Hospitals NHS Foundation Trust	Norfolk and Norwich University Hospital
	North West Anglia NHS Foundation Trust	Peterborough City Hospital
		Hinchingbrooke Hospital
	Queen Elizabeth Hospital King's Lynn NHS Foundation Trust	Queen Elizabeth Hospital Kings Lynn
	Southend University Hospital NHS Foundation Trust	Southend Hospital
	West Hertfordshire Hospitals NHS Trust	Watford General Hospital
	West Suffolk Hospital NHS Foundation Trust	West Suffolk Hospital
West Midlands	Dudley Group NHS Foundation Trust	Russells Hall Hospital
	George Eliot Hospital NHS Trust	George Eliot Hospital
	Sandwell and West Birmingham Hospitals NHS Trust (Sandwell District Hospital)	Sandwell District Hospital
	Shrewsbury and Telford Hospital NHS Trust	Princess Royal Hospital Telford
	South Warwickshire NHS Foundation Trust	Warwick Hospital
	The Royal Wolverhampton Hospitals NHS Trust	New Cross Hospital
	University Hospitals Birmingham NHS Foundation Trust (Good Hope Hospital)	Good Hope General Hospital
	University Hospitals Birmingham NHS Foundation Trust (Queen Elizabeth Hospital Edgbaston)	Queen Elizabeth Hospital Edgbaston
	University Hospitals Birmingham NHS Foundation Trust (Birmingham Heartlands)	Birmingham Heartlands Hospital
	University Hospitals Birmingham NHS Foundation Trust (Solihull Hospital)	Solihull Hospital
	University Hospitals of Derby and Burton NHS Foundation Trust (Queens Hospital Burton upon Trust)	Queens Hospital Burton upon Trent
	University Hospitals Coventry and Warwickshire NHS Trust	University Hospital Coventry
	University Hospitals of North Midlands NHS Trust	Royal Stoke University Hospital
	Worcestershire Acute Hospitals NHS Trust (Worcestershire Royal Hospital)	Worcestershire Royal Hospital
	Wye Valley NHS Trust	Hereford County Hospital
Cheshire and Mersey	Aintree University Hospital NHS Foundation Trust	University Hospital Aintree
	Countess of Chester Hospital NHS Foundation Trust	Countess of Chester Hospital
	Mid Cheshire Hospitals NHS Foundation Trust	Leighton Hospital
	Royal Liverpool and Broadgreen University Hospitals NHS Trust	Royal Liverpool University Hospital
	Southport and Ormskirk Hospital NHS Trust	Southport and Formby District General Hospital
	St Helens and Knowsley Teaching Hospitals NHS Trust	Whiston Hospital
	Warrington and Halton Hospitals NHS Foundation Trust	Warrington Hospital
	Wirral University Teaching Hospital NHS Foundation Trust	Arrowe Park Hospital
Manchester, Lancashire and South Cumbria	Blackpool Teaching Hospitals NHS Foundation Trust	Blackpool Victoria Hospital
	Bolton NHS Foundation Trust	Royal Bolton Hospital
	East Lancashire Hospitals NHS Trust	Royal Blackburn Hospital
	Lancashire Teaching Hospitals NHS Foundation Trust	Royal Preston Hospital
	Manchester University NHS Foundation Trust (Wythenshawe Hospital)	Wythenshawe Hospital
	Manchester University NHS Foundation Trust (Manchester Royal Infirmary)	Manchester Royal Infirmary
	Manchester University NHS Foundation Trust (Trafford General Hospital)	Trafford General Hospital
	Pennine Acute Hospitals NHS Trust	Fairfield General Hospital
	Salford Royal NHS Foundation Trust	Salford Royal Hospital
	Stockport NHS Foundation Trust	Stepping Hill Hospital

Region	Site Name	Hospital(s)
Manchester, Lancashire and South Cumbria	Tameside and Glossop Integrated Care NHS Foundation Trust	Tameside General Hospital
	University Hospitals of Morecambe Bay NHS Foundation Trust (Furness General Hospital)	Furness General Hospital
	University Hospitals of Morecambe Bay NHS Foundation Trust (Royal Lancaster Infirmary)	Royal Lancaster Infirmary
	Wrightington, Wigan and Leigh NHS Foundation Trust	Royal Albert Edward Infirmary
North of England	County Durham and Darlington NHS Foundation Trust	University Hospital of North Durham
	Gateshead Health NHS Foundation Trust	Queen Elizabeth Hospital Gateshead
	Newcastle upon Tyne Hospitals NHS Foundation Trust	Royal Victoria Infirmary
	North Cumbria University Hospitals NHS Trust (Cumberland Infirmary)	Cumberland Infirmary
	North Cumbria University Hospitals NHS Trust (West Cumberland Hospital)	West Cumberland Hospital
	North Tees and Hartlepool NHS Foundation Trust	University Hospitals of North Tees and Hartlepool
	Northumbria Healthcare NHS Foundation Trust (Hexham Hospital)	Hexham General Hospital
	Northumbria Healthcare NHS Foundation Trust (North Tyneside General Hospital)	North Tyneside General Hospital
	Northumbria Healthcare NHS Foundation Trust (Wansbeck General Hospital)	Wansbeck General Hospital
	Northumbria Healthcare NHS Foundation Trust (Northumbria Specialist Emergency Care Hospital)	Northumbria Specialist Emergency Care Hospital HASU
	South Tyneside and Sunderland NHS Foundation Trust (Sunderland Hospital)	Sunderland Royal Hospital
	South Tees Hospitals NHS Foundation Trust	James Cook University Hospital
Yorkshire and The Humber	Barnsley Hospital NHS Foundation Trust	Barnsley Hospital
	Bradford Teaching Hospitals and Airedale NHS Foundation Trusts	Bradford Royal Infirmary
		Airedale General Hospital
	Calderdale and Huddersfield NHS Foundation Trust	Calderdale Royal Hospital
	Chesterfield Royal Hospital NHS Foundation Trust	Chesterfield Royal
	Doncaster and Bassetlaw Teaching Hospitals NHS Foundation Trust	Doncaster Royal Infirmary
	Harrogate and District NHS Foundation Trust	Harrogate District Hospital
	Hull University Teaching Hospitals NHS Trust	Hull Royal Infirmary
	Leeds Teaching Hospitals NHS Trust	Leeds General Infirmary
	Mid Yorkshire Hospitals NHS Trust	Mid Yorkshire Hospitals NHS Trust
	Northern Lincolnshire and Goole Hospitals NHS Foundation Trust	Scunthorpe General Hospital
		Diana Princess of Wales Hospital Grimsby
	Rotherham NHS Foundation Trust	Rotherham Hospital
	Sheffield Teaching Hospitals NHS Foundation Trust	Royal Hallamshire Hospital
	York Teaching Hospital NHS Foundation Trust (York Hospital)	York Hospital
	York Teaching Hospital NHS Foundation Trust (Scarborough Hospital)	Scarborough General Hospital
South East	Ashford and St Peter's Hospitals NHS Foundation Trust	St Peter's Hospital
	Brighton and Sussex University Hospitals NHS Trust (Royal Sussex County Hospital)	Royal Sussex County Hospital
	Dartford and Gravesham NHS Trust	Darent Valley Hospital
	East Kent Hospitals University NHS Foundation Trust (William Harvey Hospital)	William Harvey Hospital
	East Kent Hospitals University NHS Foundation Trust (Queen Elizabeth The Queen Mother Hospital)	Queen Elizabeth The Queen Mother Hospital
	East Sussex Healthcare NHS Trust (Eastbourne District General Hospital)	Eastbourne District General Hospital
	Epsom and St Helier University Hospitals NHS Trust (Epsom Hospital)	Epsom Hospital

Region	Site Name	Hospital(s)
South East	Frimley Health NHS Foundation Trust (Frimley Park Hospital)	Frimley Park Hospital
	Maidstone and Tunbridge Wells NHS Trust (Tunbridge Wells Hospital)	Tunbridge Wells Hospital
	Maidstone and Tunbridge Wells NHS Trust (Maidstone Hospital)	Maidstone District General Hospital
	Medway NHS Foundation Trust (Medway Community Healthcare, Kent Community Health)	Medway Maritime Hospital
	Royal Surrey County Hospital NHS Foundation Trust	Royal Surrey County Hospital
	Surrey and Sussex Healthcare NHS Trust	East Surrey Hospital
	Western Sussex Hospitals NHS Trust (St Richard's Hospital)	St Richard's Hospital
	Western Sussex Hospitals NHS Trust (Worthing Hospital)	Worthing Hospital
South West	Gloucestershire Hospitals NHS Foundation Trust	Gloucestershire Royal Hospital
	Great Western Hospitals NHS Foundation Trust	Great Western Hospital Swindon
	North Bristol NHS Trust	North Bristol Hospitals
	Northern Devon Healthcare NHS Trust	North Devon District Hospital
	Royal Cornwall Hospitals NHS Trust	Royal Cornwall Hospital
	Royal Devon and Exeter NHS Foundation Trust	Royal Devon and Exeter Hospital
	Royal United Hospital Bath NHS Foundation Trust	Royal United Hospital Bath
	Salisbury NHS Foundation Trust	Salisbury District Hospital
	Taunton and Somerset NHS Foundation Trust	Musgrove Park Hospital
	Torbay and South Devon NHS Foundation Trust	Torbay Hospital
		Newton Abbot Hospital
	University Hospitals Bristol NHS Foundation Trust	University Hospitals Bristol Inpatient Team
	University Hospitals Plymouth NHS Trust (Derriford Hospital)	Derriford Hospital
	Weston Area Health NHS Trust	Weston General Hospital
	Yeovil District Hospital NHS Foundation Trust	Yeovil District Hospital
Thames Valley	Buckinghamshire Healthcare NHS Trust	Wycombe General Hospital
	Milton Keynes University Hospital NHS Foundation Trust	Milton Keynes General Hospital
	Oxford University Hospitals NHS Foundation Trust (Horton General Hospital)	Horton General Hospital
	Oxford University Hospitals NHS Foundation Trust (John Radcliffe Hospital)	John Radcliffe Hospital
	Royal Berkshire NHS Foundation Trust	Royal Berkshire Hospital
Wessex	Dorset County Hospital NHS Foundation Trust	Dorset County Hospital
	Hampshire Hospitals NHS Foundation Trust	Royal Hampshire County Hospital
	Isle of Wight NHS Trust	St Mary's Hospital Newport
	Poole Hospital NHS Foundation Trust	Poole Hospital
	Portsmouth Hospitals NHS Trust	Queen Alexandra Hospital Portsmouth
	Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust	Royal Bournemouth General Hospital
	University Hospital Southampton NHS Foundation Trust	Southampton General Hospital
Islands	Isle of Man Department of Health and Social Care	Noble's Hospital
Northern Ireland	Belfast Health and Social Care Trust (Royal Victoria Hospital Belfast)	Royal Victoria Hospital Belfast
	Northern Health and Social Care Trust (Causeway Hospital)	Causeway Hospital
	Northern Health and Social Care Trust (Antrim Area Hospital)	Antrim Area Hospital
	South Eastern Health and Social Care Trust (Ulster Hospitals)	Ulster Hospital
	Southern Health and Social Care Trust (Craigavon Area)	Craigavon Area Hospital

Region	Site Name	Hospital(s)
Northern Ireland	Southern Health and Social Care Trust (Daisy Hill Hospital)	Daisy Hill Hospital
	Western Health and Social Care Trust (South West Acute Hospital)	South West Acute Hospital
	Western Health and Social Care Trust (Altnagelvin Hospitals)	Altnagelvin Hospital
Wales	Aneurin Bevan University Health Board (Nevill Hall Hospital, Royal Gwent and Ysbyty Ystrad Fawr)	Royal Gwent Hospital Ysbyty Ystrad Fawr Nevill Hall Hospital
	Betsi Cadwaladr University Health Board (Ysbyty Gwynedd)	Ysbyty Gwynedd
	Betsi Cadwaladr University Health Board (Glan Clwyd District General Hospital)	Glan Clwyd District General Hospital
	Betsi Cadwaladr University Health Board (Wrexham Maelor Hospital)	Maelor Hospital
	Cardiff and Vale University Health Board	University Hospital of Wales
	Cwm Taf Morgannwg University Local Health Board (Prince Charles Hospital)	Prince Charles Hospital
	Cwm Taf Morgannwg University Local Health Board (Princess of Wales Hospital)	Princess of Wales Hospital
	Hywel Dda Health Board (West Wales Hospital)	West Wales General
	Hywel Dda Health Board (Prince Philip Hospital)	Prince Philip Hospital
	Hywel Dda Health Board (Withybush General Hospital)	Withybush General Hospital
	Hywel Dda Health Board (Bronglais General Hospital)	Bronglais Hospital
	Swansea Bay University Local Health Board (Morriston Hospital)	Morriston Hospital
	Nottingham University Hospitals NHS Trust*	Queens Medical Centre, Nottingham
	Walton Centre NHS Foundation Trust*	Walton Centre Stroke Team

*two specialist thrombectomy centres provided some data to the SSNAP acute organisational audit regarding thrombectomy. Queen's Medical Centre and Nottingham City Hospital are both part of Nottingham University Hospitals NHS Trust.

Appendix 4: Acute Organisational Audit Proforma 2019

Sentinel Stroke National Audit Programme (SSNAP)

Acute Organisational audit proforma 2019

In collaboration with Getting It Right First Time (GIRFT) in England

(G denotes a question from the GIRFT team)

School of Health and Population Sciences King's College London

This proforma should describe your stroke services as on **3rd June 2019**. Please complete all questions. Clarification is available online against each question and also in the supporting documentation provided. In some cases you will either be directed to a later question or a response will not apply based on answers to key questions. Data should be submitted via the SSNAP Web Portal strokeaudit.org/organisational audit.

Final Deadline: 28 June 2019. Checking week 1-5th July.

Helpdesk:

Telephone: 01164649901 E-mail: ssnap@kcl.ac.uk SITE CODE:[ ]

https://ssnap.zendesk.com/hc/en-us/articles/360002468957-Acute-Organisational-Audit-2019-Proforma

A. Core Organisational Information

A1. How many hospitals are covered by this form? [ ]

Please give the full name of each individual hospital. In this question, we are asking about acute hospitals which directly admit acute stroke patients or routinely admit them within 7 days.

(Table to have same number of rows as number entered for preceding question.**)**

	Full name of hospital	Total number of stroke unit beds	SSNAP code for hospital from clinical audit
1			
2			
3			
4			

TAB ONE

SECTION 1: Acute Presentation

For the purpose of this audit the definition for IN HOURS IS BETWEEN 8:00-18:00 Monday to Friday and OUT OF HOURS IS all days and times outside this range.

Care in the first 72 hours after stroke

1.1 Which of the following options best describes the service at your site for patients during the first 72 hours after stroke?

(Select only one option)

(i) We treat all of these patients ○

(ii) We treat some of these patients ○

(iii) We treat none of these patients ○

This should be what best describes your service and what happens to patients generally, not what happens in exceptional circumstances. Please see helpdesk for further information and instruction.

1.1 (a) If 1.1 (iii) is selected give the SSNAP site code of main hospital treating your patients for the first 72 hours [ ] This is the organisational audit site code, not the SSNAP team code

If 1.1(iii) is chosen: go straight to Section 2 question 2.1 after completing 1.1 (a) and omit remaining questions in this section on acute presentation.

If 1.1 is either (i) or (ii) complete the following:

Initial Review on Presentation This section must be completed by all hospitals to treat some or all patients seen during the first 72 hours after stroke.

1.2 Most of the time, who is the first person ***from any team*** to review a patient presenting to hospital with a suspected stroke? **G** (Select only one option for in hours and one option for out of hours)

	In Hours	Out of Hours
(i) Stroke Specialist Nurse	○	○
(ii) Stroke Junior Doctor (CMT/Foundation Trainee)	○	○
(iii) Stroke trained Registrar/Fellow	○	○
(iv) General Medical Registrar	○	○
(v) Stroke Specialist / General Neurology Consultant	○	○
(vi) Other Medical Speciality Consultant	○	○
(vii) A&E Consultant	○	○
(viii) A&E Junior Doctor/Registrar	○	○
(ix) Neurology Junior Doctor/Registrar	○	○
(x) Telemedicine link to own Trust Stroke Consultant	○	○
(xi) Telemedicine link to regional network Consultant	○	○

1.3 Most of the time, who is the first person ***from the stroke team*** to review a patient presenting to hospital with a suspected stroke? **G** (Select only one option for in hours and one option for out of hours)

	In Hours	Out of Hours
(i) Stroke Specialist Nurse	○	○
(ii) Stroke Junior Doctor (IMT/Foundation Trainee)	○	○
(iii) Stroke trained Registrar/Fellow	○	○
(iv) Stroke Specialist Consultant	○	○
(v) General Neurology Consultant	○	○
(vi) Neurology Junior Doctor/Registrar	○	○
(vii) Telemedicine link to own Trust Stroke Consultant	○	○
(viii) Telemedicine link to regional network Consultant	○	○

Scanning

1.4 What initial acute brain imaging do you request for the following? **G**

(Select all that apply)

	CT	CTA	CTP	MRI
(i) Clinical suspicion of stroke amenable to thrombolysis	☐	☐	☐	☐
(ii) Clinical suspicion of stroke amenable to thrombolysis & possible thrombectomy	☐	☐	☐	☐
(iii) Clinical suspicion of stroke but over 4.5 hours since onset of symptoms	☐	☐	☐	☐
(iv) Clinical suspicion of posterior circulation stroke but not a thrombolysis candidate	☐	☐	☐	☐
(v) Clinical suspicion of alternative neurological diagnosis	☐	☐	☐	☐

CT = Computerised tomography, CTA =CT angiography, CTP= CT perfusion MRI= Magnetic resonance imaging

1.5 Who is responsible for initial review of brain imaging to inform decisions about thrombolysis / thrombectomy? **G** (Select all that apply. Select at least one option for in hours and one for out of hours) (If this is more than one person please tick more than one response e.g. if stroke consultant reviews the images as well as the general radiologist, tick both responses)

	In Hours	Out of Hours
(i) Stroke Consultant on site	☐	☐
(ii) Stroke Consultant remotely via PACS	☐	☐
(iii) Stroke Registrar	☐	☐
(iv) Stroke Junior Doctor	☐	☐
(v) Neuroradiologist	☐	☐
(vi) General Radiologist	☐	☐
(vii) "Reporting Hub"	☐	☐
(viii) A&E Consultant/Registrar	☐	☐
(ix) Medical Consultant/Registrar	☐	☐
(x) Stroke consultant at own Trust via telemedicine link	☐	☐
(xi) Stroke consultant in region/network via telemedicine link	☐	☐

1.6 If not during initial assessment, is brain imaging subsequently reviewed by a radiologist with a specific competency in neurovascular imaging in the following patient groups? **G** (Select only one option for each patient group)

a. **Thrombolysis patients**

Yes always ○
Yes sometimes ○
Yes rarely ○
No ○

b. **Large Vessel Occlusion**

Yes always ○
Yes sometimes ○
Yes rarely ○
No ○

c. **All stroke patients**

Yes always ○
Yes sometimes ○
Yes rarely ○
No ○

1.7 Do you have stroke specialist nurses (band 6 or above) who undertake hyper-acute assessments of suspected stroke patients in A&E? **G** (Select one option for in hours and one option for out of hours)

	In Hours	Out of Hours
Yes	○	○
No	○	○

1.8 Are your stroke specialist nurses counted within your ward based nurse establishment? **G** (i.e. they are not supernumerary to your ward based nurses)? (Select one option for in hours and one option for out of hours) *These are specialist nurses who have responsibilities outside the stroke unit.*

	In Hours	Out of Hours
Yes	○	○
No	○	○

1.9 Do you ever use video tele-health to review patients with your ambulance crews **G** (Select one option only)

Yes ○ No ○

1.10 Do the stroke team receive a pre-alert (telephone call) from your ambulance crews for suspected stroke patients? **G (**Select yes/no/sometimes for each type of patient)

	Yes	No	Sometimes
Thrombolysis candidates only	○	○	○
All FAST positive	○	○	○
All other suspected strokes	○	○	○

If Yes or sometimes to Q 1.10

1.11 If the stroke team receive a pre-alert, who is the call usually made to? **G** (Select all that apply)

Stroke Specialist Nurse ☐
Directly to Accident and Emergency Department ☐
Stroke Junior Doctor on call ☐
Stroke Consultant on call ☐
CT control room ☐
Call to Stroke ward / HASU ☐

If Yes or sometimes to Q 1.10

1.12 If the stroke team receive a pre-alert, what information are they usually given by the paramedic crew? **G** (Select all that apply)

Name ☐
Date of birth ☐
Symptoms ☐
Time of onset ☐
BP measurement by Paramedics ☐
List of medications ☐
NHS number ☐
Only that patient is on their way ☐

1.13 Where are your suspected stroke patients that arrive by ambulance taken to for assessment? **G** (Select all that apply. You must select at least one option for each type of patient)

	Potential Thrombolysis patients	All other suspected stroke patients
A&E	☐	☐
HASU/ASU	☐	☐
Neurology Ward	☐	☐
Combined stroke/neurology ward	☐	☐
Acute Medical Unit	☐	☐
HDU/ITU/CCU	☐	☐
CT scan	☐	☐

1.14 Do you actively admit patients with subarachnoid haemorrhage to your stroke unit? **G (**Select only one option)

Yes ○ No ○

1.15 Do you actively admit patients with subdural haematoma to your stroke unit? **G (**Select only one option)

Yes ○ No ○

Telemedicine

1.16 Does the stroke service at your site use telemedicine to allow remote access for the management of acute stroke care? (Select only one option)

Yes ○ No ○

If yes to 1.16:

1.17 Which of the following do you use: (Select all that apply)

(i) Remote viewing for brain imaging ☐
(ii) Video enabled clinical assessment ☐

1.18 Do you operate a telemedicine rota with other hospitals?

(Select only one option)

Yes ○ No ○

1.19 Which of the following groups of patients are assessed using telemedicine?

(Select only one option)

Only patients potentially eligible for thrombolysis ○

Some patients (regardless of eligibility for thrombolysis) ○

All patients (who require assessment during times when telemedicine is in use) ○

TAB TWO

SECTION 2: STROKE UNITS

2.1 Please give the following details on type and number of stroke unit beds for each of these hospitals:

		Answer separately for each hospital			
	(a) Full name of hospital	**(b)** Total number of stroke unit beds (can be 0).*	**(c)** Number of stroke unit beds **solely** for patients in first 72 hours after stroke **TYPE 1 Beds**	**(d)** Number of stroke unit beds **solely** for patients beyond 72 hours after stroke **TYPE 2 Beds**	**(e)** Number of stroke unit beds used for **both** pre and post-72 hour care **TYPE 3 beds**
	TOTAL:				

SECTION 2A: STROKE UNIT - Care on stroke unit beds used solely for patients in the first 72 hours after stroke (please answer based on ALL beds recorded in 2.1(c)) TYPE 1 BEDS

2.2 How many of these beds have continuous physiological monitoring (ECG, oximetry, blood pressure)?

[ ] beds

2.3 How many stroke consultant ward rounds are conducted on your acute stroke ward per week?

[ ] ward rounds per week

(If you have 2 consultant led ward rounds 7 days a week please enter 14. If there is more than one location for these beds, please give an average e.g. if there are 20 beds overall and 10 have ward rounds 7 times a week and the other 10 have ward rounds 5 times a week, you should put 6. If you have permutations outside of this please contact the SSNAP helpdesk).

For questions 2.5 - 2.8 only the nursing staff for the beds solely used for patients in the first 72 hours after stroke (i.e. the total entered for 2.1c) should be included.

2.4 How many of the following *nursing* staff are there usually on duty at **10AM** for these beds? (Enter 0 if no staff of that grade). *Only the nursing staff for the beds which are solely used for patients in the first 72 hours after stroke (i.e. the total entered for 2.1c).*

(N.B. Please do not double count any nurses/care assistants listed in 2.09 and 2.16)

	Weekdays	Saturdays	Sundays/Bank Holidays
(i) Registered nurses	[ ]	[ ]	[ ]
(ii) Care assistants	[ ]	[ ]	[ ]

2.5 How many nurses are there usually on duty for these beds at 10am who are trained in the following? (Enter 0 if none).

(N.B. Please do not double count any nurses listed in 2.10 and 2.17)

	Weekdays	Saturdays	Sundays/Bank Holidays
(i) Swallow screening	[ ]	[ ]	[ ]
(ii) Stroke assessment and management	[ ]	[ ]	[ ]

2.6 How many nurses are there usually on duty for these beds at **10PM** for these beds? (Enter 0 if no staff of that grade). *Only the nursing staff for the beds which are solely used for patients in the first 72 hours after stroke (i.e. the total entered for 2.1c).*

(N.B. Please do not double count any nurses/care assistants listed in 2.11 and 2.18)

	Weekdays	Saturdays	Sundays/Bank Holidays
(i) Registered nurses	[ ]	[ ]	[ ]
(ii) Care assistants	[ ]	[ ]	[ ]

2.7 What is the total establishment of whole time equivalents (WTEs) of the following bands of nurses for your Type 1 beds (beds solely for patients in the first 72 hours after stroke) in your site?

(Enter 0 if no establishment)

Type 1 beds (beds solely for patients in first 72 hours after stroke)	**Whole time equivalents (WTE)**
Band 1	
Band 2	
Band 3	
Band 4	
Band 5	
Band 6	
Band 7	
Band 8a	
Band 8b	
Band 8c	

2.7a How are your type1 beds currently funded? **G** (Select only one option)

Block contract ○

Payment by results (PBR) ○

Uplifted/enhanced tariff ○

Unfunded (at risk) ○

Not known ○

Site in Wales or N/Ireland (N/A) ○

SECTION 2B Care on stroke unit beds used solely for patients beyond 72 hours after stroke (please answer based on ALL beds noted in 2.1(d)) TYPE 2 Beds

2.8 How many days per week is there a stroke specialist consultant ward round for these beds? [ ]

(If there is more than one location for these beds, please give an estimated average e.g. if there are 20 beds overall and 10 have ward rounds 7 times a week and the other 10 have ward rounds 5 times a week, you should put 6. If you have permutations outside of this please contact the SSNAP helpdesk).

2.9 How many of the following *nursing* staff are there usually on duty at 10am for these beds? (Enter 0 if no staff of that grade) *Only the nursing staff for the beds which are solely used for patients beyond the first 72 hours after stroke (i.e. the total entered for 2.1d)*
*(N.B. Please do not double count any nurses/care assistants listed in **2.4 and 2.16**)*

	Weekdays	Saturdays	Sundays/Bank Holidays
(i) Registered nurses	[ ]	[ ]	[ ]
(ii) Care assistants	[ ]	[ ]	[ ]

2.10 How many nurses are there usually on duty for these beds at 10am who are trained in the following? (Enter 0 if none). *(N.B. Please do not double count any nurses listed in 2**.5 and 2.17**)*

	Weekdays	Saturdays	Sundays/Bank Holidays
(i) Swallow screening	[ ]	[ ]	[ ]
(ii) Stroke assessment and management	[ ]	[ ]	[ ]

2.11 How many of the following *nursing* staff are there usually on duty at **10PM**for these beds? (Enter 0 if no staff of that grade) *Only the nursing staff for the beds which are solely used for patients beyond the first 72 hours after stroke (i.e. the total entered for 2.1d)*
*(N.B. Please do not double count any nurses/care assistants listed in **2.6 and 2.18**)*

	Weekdays	Saturdays	Sundays/Bank Holidays
(i) Registered nurses	[ ]	[ ]	[ ]
(ii) Care assistants	[ ]	[ ]	[ ]

2.12 What is the total establishment of whole time equivalents (WTEs) of the following bands of nurses for type 2 beds (beds solely for patients beyond 72 hours after stroke) (Enter 0 if no establishment)

Type 2 beds (beds for patients beyond 72 hours after stroke)	**Whole time equivalents (WTE)**
Band 1	
Band 2	
Band 3	
Band 4	
Band 5	
Band 6	
Band 7	
Band 8a	
Band 8b	
Band 8c	

2.13 How are your type 2 beds currently funded? **G** (Select only one option)

Block contract ○
Payment by results (PBR) ○
Uplifted/enhanced tariff ○
Unfunded (at risk) ○
Not known ○
Site in Wales or N/Ireland (N/A) ○

SECTION 2C Care on Stroke Unit beds which are used for both pre and post-72-hour care (please answer based on ALL beds noted in 2.1(e)) TYPE 3 beds

2.14 How many of these beds have continuous physiological monitoring (ECG, oximetry, blood pressure)?
[ ] beds

2.15 How many stroke consultant ward rounds are conducted on your acute stroke ward per week?
[ ] ward rounds per week

(If you have 2 consultant led ward rounds 7 days a week please enter 14. If there is more than one location for these beds, please give an average e.g. if there are 20 beds overall and 10 have ward rounds 7 times a week and the other 10 have ward rounds 5 times a week, you should put 6. If you have permutations outside of this please contact the SSNAP helpdesk).

Type 3 beds (beds used for pre and post 72 hours only).
2.16 How many of the following *nursing* staff are there usually on duty at **10AM** for these beds? (Enter 0 if no staff of that grade). *(N.B. Please do not double count any nurses/care assistants listed in 2.4 and 2.9. Only the nursing staff for the beds which are solely used for patients' pre and post 72-hour care (i.e. the total entered for 2.1e.)*

	Weekdays	Saturdays	Sundays/Bank Holidays
(i) Registered nurses	[ ]	[ ]	[ ]
(ii) Care assistants	[ ]	[ ]	[ ]

2.17 How many nurses are there usually on duty for these beds at **10AM** who are trained in the following? (Enter 0 if none). *(N.B. Please do not double count any nurses listed in 2.5* or *2.10)*

	Weekdays	Saturdays	Sundays/Bank Holidays
(iii) Swallow screening	[ ]	[ ]	[ ]
(iv) Stroke assessment and management	[ ]	[ ]	[ ]

2.18 How many of the following *nursing* staff are there usually on duty at **10PM** for these beds? (Enter 0 if no staff of that grade). *(N.B. Please do not double count any nurses/care assistants listed in 2.6 and 2.11. Only the nursing staff for the beds which are solely used for patients' pre and post 72-hour care (i.e. the total entered for 2.1e.)*

	Weekdays	Saturdays	Sundays/Bank Holidays
(i) Registered nurses	[ ]	[ ]	[ ]
(ii) Care assistants	[ ]	[ ]	[ ]

2.19 What is the total establishment of whole time equivalents (WTEs) of the following bands of nurses for type 3 beds (beds for both pre and post 72 hour care)? (Enter 0 if no establishment)

Type 3 beds Beds for both pre and post 72 hour care)	**Whole time equivalents (WTE)**
Band 1	
Band 2	
Band 3	
Band 4	
Band 5	
Band 6	
Band 7	
Band 8a	
Band 8b	
Band 8c	

2.19a How are your type 3 beds funded? **G** (Select only one option)

- Block contract ○
- Payment by results (PBR) ○
- Uplifted/enhanced tariff ○
- Unfunded (at risk) ○
- Don't know ○
- Site in Wales or N/Ireland (N/A) ○

TAB THREE

SECTION 3: THROMBOLYSIS AND THROMBECTOMY

Thrombolysis

3.1 Where are the majority of your patients thrombolysed for each procedure? **G** (Select at least one option for bolus and one for infusion)

	Bolus	**Infusion**
A&E	☐	☐
In the CT scanner	☐	☐
Where your Type 1 or Type 3 beds are based	☐	☐
CCU/ITU/HDU	☐	☐
Acute Medical Unit /Medical Ward	☐	☐
Neurology ward	☐	☐

Thrombectomy

3.2 Are you a thrombectomy centre? (Select only one option)

Yes ○ No ○

If no to 3.2 go to 3.5

If yes to 3.2

3.3 What are the hours of operation for your thrombectomy service? (Select only one option)

- (i) Monday – Friday, 9am – 5pm ○
- (ii) Monday – Friday, extended hours ○
- (iii) Extended hours including weekends ○
- (iv) 24 hours a day, 7 days a week ○
- (v) Occasional daytime hours during weekends ○

3.4 How many consultant level doctors from your site carry out thrombectomy? [ ]

(Please do not include doctors who work primarily at other sites - each doctor should only be counted at one site. Please include doctors who have performed 1 or more thrombectomy procedures)

For each of these consultants, please state their specialty.

3.4a Which specialty is this consultant?	**Consultant:**									
	1:	**2:**	**3:**	**4:**	**5:**	**6:**	**7:**	**8:**	**9:**	**10:**
Interventional neuroradiology	O	O	O	O	O	O	O	O	O	O
Vascular interventional neuroradiology	O	O	O	O	O	O	O	O	O	O
Non-vascular interventional neuroradiology	O	O	O	O	O	O	O	O	O	O
Cardiologist	O	O	O	O	O	O	O	O	O	O
Neuro-surgeon	O	O	O	O	O	O	O	O	O	O
Stroke Physician	O	O	O	O	O	O	O	O	O	O
Other	O	O	O	O	O	O	O	O	O	O

If no to 3.2

3.5 Do you refer appropriate patients to a thrombectomy centre? (Select only one option)

Yes ○ No ○

If yes to 3.5,

3.6 Which centre do you refer patients to for thrombectomy? **G** (Select from the list supplied the centre where the majority of your patients are referred to)

If yes to question 3.5

3.7 How many patients have you transferred to a thrombectomy centre that **did not have the procedure** in the 12 months prior to June 2019 **G**? (Enter a number) [ ]

If no to 3.2 and no to 3.5 (go to Q3.12a)

If yes to 3.5

3.8 What is your process for IV thrombolysis prior to transfer for thrombectomy? **G**
(Select all that apply)

Give Bolus and full infusion before transfer	☐
Give Bolus and infusion but stop infusion at point patient ready to be transferred	☐
Give Bolus and infusion which is continued in ambulance with support of stroke nurse on transfer	☐
Give Bolus and infusion which is continued in ambulance with support of A&E nurse on transfer	☐
Give Bolus and infusion which is continued in ambulance with support from paramedic crew	☐
Process depends on ambulance service conveying patient (i.e. different protocols for different services)	☐

3.9 Who makes the decision that there is a large vessel occlusion on CTA imaging prior to transferring for thrombectomy? **G** (Select all that apply. You must select at least one option for in hours and one option for out of hours)

	In Hours	**Out of Hours**
Stroke Junior Doctor making referral	☐	☐
Stroke Consultant	☐	☐
General Radiologist	☐	☐
Neuroradiologist at your hospital	☐	☐
Neuroradiologist at IAT Centre (if different)	☐	☐
Stroke team at thrombectomy centre	☐	☐
Remote tele-radiology service off site	☐	☐
No service		☐

3.10 When a patient requires conveyance to thrombectomy centre at what point do you call the first responder ambulance service? **G** (Select only one option)

Paramedic crew are kept on standby and not released from initial call	○
At the point IV thrombolysis is complete	○
At the point CTA suggests occluded vessel	○
When accepted by thrombectomy centre	○

3.11 Do the stroke team use helicopter transfers for thrombectomy patients? **G** (Select only one option)

Yes ○ No ○

3.12a What is the average time between call to ambulance from acute hospital to arrival of ambulance crew at acute hospital for your last 5 cases / over last 12 months **G**? (Select only one option)

	Call to Arrival of ambulance crew
10-30mins	○
31-60mins	○
61-90mins	○
91-120mins	○
>120 mins	○

3.12 b What is the average time between arrival of the ambulance at the acute hospital to departure from acute hospital for your last 5 cases / over last 12 months? **G** (Select only one option)

	Time from arrival of ambulance crew to departure
10-30mins	○
31-60mins	○
61-90mins	○
91-120mins	○
>120 mins	○

3.13 What are your arrangements (governance processes) for discussion of patients referred for thrombectomy? **G** (Select only one option)

Most patients referred reviewed with thrombectomy centre as part of regional MDT	○
Most patients referred reviewed locally as part of local MDT	○
Informal feedback	○
No regular discussion	○

TAB FOUR

SECTION 4: SPECIALIST INVESTIGATIONS FOR STROKE AND TIA PATIENTS

4.1 What is the usual waiting time for patients to receive carotid imaging? **G** (Select only one option)

(i) The same day (7 days a week)	○
(ii) The same day (5/6 days a week)	○
(iii) The next day	○
(iv) The next weekday	○
(v) Within a week	○
(vi) Longer than a week	○

4.2 Do you ever image ***intra-cranial vessels*** for your ischaemic stroke patients? **G** (Select only one option)

Yes ○ No ○

If yes, to 4.2

4.2a Which of the following best describes your practice for imaging these vessels? **G** (Select only one option)

It is a routine investigation ○
Only for patients that would be amenable to specific treatment if abnormality detected ○

If yes to 4.2

4.2b Which of the following methods do you use? **G** (Select all that apply. Select at least one option for in hours and one option for out of hours

	In hours	**Out of hours**
CTA	☐	☐
MRA – (CEMRA)	☐	☐
MRA – (ToF)	☐	☐
No service		☐

MRA – (CEMRA = contrast enhanced magnetic resonance imaging, MRA – (ToF) = time of flight imaging

4.3 Do you image ***extra cranial vessels*** for your ischaemic stroke patients? **G** (Select only one option)

Yes ○ No ○

If yes, to 4.3

4.3a Which of the following best describes your practice for imaging these vessels? **G** (Select only one option)

It is a routine investigation ○
Only for patients that would be amenable to specific treatment if abnormality detected ○

4.3b Which imaging modality do you use as a first line to ***image extra-cranial*** vessels? **G** Select only one option for in hours and only one option for out of hours

	In Hours	**Out of Hours**
Doppler Ultrasound	○	○
CTA	○	○
MRA – (CEMRA)	○	○
MRA – (ToF)	○	○
No service		○

MRA – (CEMRA = contrast enhanced magnetic resonance imaging, MRA – (ToF) = time of flight imaging

4.4 What is your usual pathway for detecting paroxysmal atrial fibrillation? **G**
Please list in the sequence of investigations you apply i.e. 1=1st, 2= 2nd etc.)
Chronological order, 1 = First, 2= Second, 7= last

HASU telemetry monitoring ☐
Inpatient 24 hour tape ☐
Outpatient 24 hour tape ☐
Extended cardiac recording: 48 hours ☐
Extended cardiac recording: 5- 7 days ☐
Reveal/implantable loop recorder ☐
Transdermal patch (e.g. Ziopatch) ☐

4.5 In which stroke patients do you normally perform echocardiography? **G** (Select all that apply)

In the majority of patients post stroke ☐
Patients suggestive of cardioembolic source on brain imaging ☐
Patients with abnormal ECG's ☐
Patients with suspected valvular lesions ☐
Patients with new heart failure ☐
Patients with known heart failure ☐
We rarely do echocardiography ☐

4.6 In which patients do you request a bubble contrast echo? **G** (Select all that apply)

All patients post stroke ☐
All patients with suspected cardioembolic source on brain imaging ☐
Patients with suspected cardioembolic source but initial transthoracic echocardiogram (**TTE**) normal ☐

4.7 In which patients do you request a TOE (trans-oesophageal echo)? **G** (Select all that apply)

All patients post stroke ☐
All patients with suspected cardioembolic source on brain imaging ☐
Patients with suspected cardioembolic source but initial transthoracic echocardiogram (**TTE**) normal ☐
If patient has had a positive bubble contrast echo ☐

4.8 Is PFO closure available locally for your stroke patients? (this refers to NHS rather than private provision) **G** (Select only one option)

Yes ○ No ○
If no to 4.8 go straight to 4.9
If yes to 4.8a

4.8a Are all patients discussed at a specialist stroke/cardiology MDT before PFO closure is offered? **G** (Select only one option)

Yes ○ No ○

4.9 In which stroke patients do you request thrombophilia screening? **G** (Select only one option)

Majority of patients ○
Only patients under a specific age ○
Only patients with previous history of previous DVT/ PE /miscarriage ○
None ○

4.10 Which imaging modality do you most frequently use in your neurovascular clinic for suspected TIAs? Select only one option for brain imaging and on option for carotid imaging

4.10a First line brain imaging:

CT ○
MRI ○
Rarely image TIAs ○

4.10b First line carotid imaging:

Carotid Doppler ○
CTA ○
MRA – (CEMRA) ○
MRA – (ToF) ○
Rarely image TIAs ○

4.11 How frequently do you use this first line brain imaging modality in your neurovascular clinic for suspected TIAs? **G** (Select only one option)

Frequently (>70%) ○
Sometimes (30-70%) ○
Rarely (<30%) ○

TAB FIVE

SECTION 5: SERVICES AND STAFF ACROSS ALL STROKE UNIT BEDS

Do not answer this section if you do not have any stroke units across your site (i.e. if total of 2.1(b) = 0)

5.1 Does your stroke unit have access to the following within 5 days of referral? (Select yes or no for each option)

	Yes	No
a) Social work	○	○
(b) Orthotics	○	○
(c) Orthoptics	○	○
(d) Podiatry/foot health	○	○

5.2 What is the total establishment of whole time equivalents (WTEs) and number of individuals of the following qualified professionals and support workers for all your stroke unit beds? (Enter 0 if no establishment).

NB Only tick the 6 day working or 7 day working option if these professionals treat stroke patients ***in relation to stroke management*** at weekends ***on the stroke unit***.

	Whole time equivalents WTE	Individuals	5 day working	6 day working	7 day working
(i) Clinical Psychology (qualified)			O	O	O
(ii) Clinical Psychology (support worker)			O	O	O
(iii) Dietetics (qualified)			O	O	O
(iv) Dietetics (support worker)			O	O	O
(v) Occupational Therapy (qualified)			O	O	O
(vi) Occupational Therapy (support worker)			O	O	O
(vii) Physiotherapy (qualified)			O	O	O
(viii) Physiotherapy (support worker)			O	O	O
(ix) Speech & Language Therapy (qualified)			O	O	O
(x) Speech & Language Therapy (support worker)			O	O	O
(xi) Pharmacy (qualified)			O	O	O
(xii) Pharmacy (support worker)			O	O	O
(xiii) Nursing (registered): Band 6			O	O	O
(xiv) Nursing (registered): Band 7			O	O	O
(xv) Nursing (registered): Band 8a			O	O	O
(xvi) Nursing (registered): Band 8b			O	O	O
(xvii) Nursing (registered): Band 8c			O	O	O

Junior Doctor Sessions

5.3 How many sessions of junior doctor time are there per week in total for all stroke unit beds?

a. Specialty trainee 3 (ST3)/registrar grade or above [ ] Sessions
b. Foundation years/core training/ST1/ST2 or below [ ] Sessions
c. Non training grade junior doctor [ ] Sessions

5.4 Do you have Physician Associates as part of your clinical team? (Select only one option)

Yes ○ No ○

5.4a How many whole time equivalents do these Physician Associates (Physician Assistants) work across your stroke service? **G** [ ] WTEs

Venous thromboembolism prevention

5.5 What is your first line treatment for preventing venous thromboembolism for patients with reduced mobility? (Select only one option)

(i) Short or long compression stockings ○
(ii) Intermittent pneumatic compression device ○
(iii) Low molecular weight heparin ○
(iv) None of the above ○

Post Discharge Reviews

Reviews at 6 weeks

5.6 Does a stroke patient get a post discharge review within ***6 weeks*** post discharge from hospital? **G** (Select only one option)

Yes ○ No ○

(If no go to Q5.8)

5.7 If yes to 5.6 Who completes the ***6 week*** reviews post discharge from hospital? **G** (Select all that apply)

Primary care	☐
Acute trust stroke team consultant	☐
Stroke Nurse in hospital/community	☐
Voluntary section e.g. Stroke Association	☐
ESD team	☐
Community therapy team	☐
Not routinely arranged	☐

Reviews at 6 months

5.8 Are you commissioned (or in Wales and Northern Ireland expected) to carry out ***6 month*** reviews? **G** (Select only one option)

Yes ○ No ○

5.9 Are the patients that you discharge given a ***6 month*** post stroke review? **G** (Select only one option)

All	○
Some	○
None	○

If all or some is selected must answer 5.10. If none is selected go straight to 5.11

5.10 Who carries out your ***6 month*** reviews post discharge from hospital? **G** (Select all that apply)

Specialist Stroke Nurses within hospital	☐
Specialist Stroke Nurses in community	☐
Stroke Association	☐
Other third sector	☐
Primary care	☐
Stroke Consultant at Acute Trust	☐
MDT 6 month review clinic i.e. with therapy support	☐
Community Therapists	☐

5.11 On the 3rd of June, how many patients on your stroke ward are 'medically fit for discharge' (i.e. no longer requiring hospital bed based care)? **G** [}

(note the total must not be greater than total number of stroke unit beds)

5.12 Do you move patients no longer receiving specific stroke intervention to other wards if you need the bed for another stroke patient? **G (**Select only one option)

Yes	○
No	○
Only in exceptional circumstances	○

TAB SIX

SECTION 6: OTHER STROKE CARE MODELS

EARLY SUPPORTED DISCHARGE TEAM

Definitions:

Early supported discharge team refers to a multidisciplinary team which provides rehabilitation and support in a community setting with the aim of reducing the duration of hospital care for stroke patients.

Specialist Early Supported Discharge Team

A **stroke/neurology specific team** is one which treats stroke patients either solely or as well as general neurology patients. This question should not include non-stroke/neurology specific teams.

6.1 Do you have access to at least one **stroke/neurology specific** early supported discharge multidisciplinary team? (Select only one option)

Yes ○ No ○

If no go to 6.2

6.1a How many Specialist Early Supported Discharge (ESD) teams does your site have access to? (*Only include teams which see more than 10 patients a year.)* [ ] ESD teams

6.1b What percentage of your patients have access to at least one of these teams if needed? [ ]%

Please answer for the team providing care for the majority of your patients if you have multiple providers

6.1c For the ESD team that the majority of your patients attend, what duration of time post discharge are they commissioned for? (please select option closest to the duration) **G** (Select only one option)

6 weeks	○
6 months	○
12 months	○
Needs based	○
No time limit	○

6.1d How is your ESD service currently funded? (this refers to your largest provider) **G** (Select only one option)

Block contract	○
Payment by results (PBR)	○
Uplifted/enhanced tariff	○
Unfunded (at risk)	○
Not known	○
Site in Wales or N/Ireland (N/A)	○

6.2 Do you have access to specialist spasticity services for the majority of your patients? **G** (Select only one option)

Yes ○ No ○

LONGER TERM COMMUNITY REHABILITATION TEAM

Definition: A team working in the community delivering rehabilitation services.

We will ask you about two types of CRT team in this part - stroke/neurology specialist and non-specialist (please make sure you answer the correct section(s) - this could be none, either or both)

Specialist Community Rehabilitation Team

A stroke/neurology specific team is one which treats stroke patients either solely or as well as general neurology patients.

6.3 Do you have access to at least one **stroke/neurology specific** community rehabilitation team for longer term management? (Select only one option)

Yes ○ No ○

If no to 6.3 go to 6.4

If yes to 6.3

6.3a How many specialist Community Rehabilitation teams does your site have access to? (*Only include teams which see more than 10 patients a year.)* [ ]

6.3b What percentage of your patients have access to at least one of these teams if needed? [ ]%

Non-specialist Community Rehabilitation Team

Definition: A non-specialist team is one which treats stroke patients, general neurology patients and other types of patients.

6.4 Do you have access to at least one non-specialist community rehabilitation team for longer term management? (Select only one option)

Yes ○ No ○

If no go to 7.1

If yes go to 6.4

6.4a How many non-specialist Community Rehabilitation teams who your site have access to? (*Only include teams which see more than 10 patients a year.)* [ ]

6.4b What percentage of your patients have access to at least one of these teams if needed? [ ]

TAB SEVEN

SECTION 7: TIA/NEUROVASCULAR SERVICE

7.1 Does your site have a neurovascular clinic? (Select only one option)

Yes ○ No ○

If no to 7.1:

7.2 If no, who provides this for your patients (select one option (a) or (b) only)?

(i) Another site within our trust ○

Please give name and site code [ ] 3 digit code

(ii) Another site not within our trust ○

Please give name and site code: [ ] 3 digit code

If no to 7.1 Please go to 7.12 after answering 7.2.

If yes to 7.1:

7.3 How many clinics within a 4 week period? [ ]

7.4 How many new patients were seen during the past 4 weeks? [ ]

7.5 What is the current average waiting time for an appointment from referral? [ ] days

7.6 How are patients referred into your TIA / neurovascular service ? **G** (Select all options that apply)

Via email/electronic referral ☐

Fax ☐

Written referral via post to stroke team ☐

Written referral via post to Choose and Book ☐

Telephone referral to stroke team ☐

7.7 Do the stroke team triage referrals to the TIA /neurovascular service? **G** (Select only one option)

Yes ○ No ○

If yes to 7.7:

7.8 Does this involve a telephone call to the patient? **G** (Select only one option)

Yes ○ No ○

If yes to 7.8

7.9 Who triages the referrals? **G** (Select all that apply. Select a minimum of one option for in hours and one option for out of hours)

	In hours	**Out of hours**
Stroke Consultant	☐	☐
Stroke Junior Doctor	☐	☐

Stroke Specialist Nurse	☐	☐
Stroke Specialist Nurse followed by Stroke Dr	☐	☐
Admin staff based on triage criteria	☐	☐
Stroke team contact all patients (tele-triage)	☐	☐
Other	☐	☐

If yes to 7.7

7.10 Do you classify your patients as high risk or low risk of stroke using the ABCD^2 score? **G** (Select only one option)

Yes ○ No ○

7.11 Within what timescale can you see, investigate and initiate treatment for ALL your TIA patients? (Select yes or no for each service) **G**

Tick which service(s) you have:	**a)** Inpatient Yes	No	**b)** Outpatient Yes	No
(i) The same day (7 days a week)	○		○	
(ii) The same day (5 days a week)	○		○	
(iii) The next day	○		○	
(iv) The next weekday	○		○	
(v) Within a week	○		○	
(vi) Within a month	○		○	
(vii) Longer than a month	○		○	

7.12 What is the total number of inpatients with confirmed or suspected TIA across all primary admitting hospitals on 3rd June 2019? [ ]

If 7.12 is 0 please go to Section 8.

7.13 How many inpatients with confirmed or suspected TIA are in **stroke unit beds** across all primary admitting hospitals on 3rd June 2019? [ ] patients

TAB EIGHT

SECTION 8: SPECIALIST ROLES

8.1 Do you have at least one accredited specialist registrar in a post registered for stroke specialist training? (Select only one option)

Yes ○ No ○

If yes to 8.1 answer 8.2 and 8.3
If no to 8.1 go straight to 8.4

8.2 How many accredited specialist registrar posts do you have at your site? [ ] posts

8.3 How many of the posts in 8.2 are currently filled? [ ] posts

The aim of this section is to match the stroke care you provide to the type of consultant workforce that is, and may in the future, be available in your site. This may improve both national planning for training of future consultant physicians working in stroke medicine and their equitable distribution

8.4 Do you have any unfilled stroke consultant posts? (Select only one option)

Yes ○ No ○

If yes to 8.4

8.4a How many programmed activities (PAs) do these posts cover? [ ] PAs

8.4b For how many months have these posts been funded but unfilled? [ ] months

If no to 8.4

Existing posts

8.5 How many programmed activities (PAs) do you have in total for Stroke Consultant Physicians? [ ] PAs

8.5a How many consultants (individuals) are these PAs divided amongst? [ ] Consultants

8.5b How many of these PAs are Direct Clinical Care (DCCs) for Stroke? [ ] PAs

Planned future posts

This section refers to changes planned in the next **2 years**.

8.6 How many new/additional programmed activities (PAs) do you plan to have for Stroke Consultant Physicians? [ ] PAs

If 8.6 is '0' go to section 9

8.6a How many new/additional consultants (individuals) will these PAs be divided amongst?

[ ] Consultants

8.6b How many of these new/additional PAs will be for Direct Clinical Care (DCC) for Stroke? [ ] PAs

TAB NINE

SECTION 9: QUALITY IMPROVEMENT, TRAINING & LEADERSHIP AND PATIENTS

9.1 What level of management takes responsibility for the follow-up of the results and recommendations of the Sentinel Stroke Audit? (Select all that apply)

(i) Executive on the Board	☐
(ii) Non-executive on the Board	☐
(iii) Chairman of Clinical Governance (or equivalent)	☐
(iv) Directorate Manager	☐
(v) Stroke Clinical Lead	☐
(vi) Other	☐
(vii) No specific individual	☐

9.2 Is there a strategic group responsible for stroke? (Select only one option)

Yes ○ No ○

If yes to 9.2

9.2a Which of the following does it include? (Select all that apply. Select at least one option)

- (i) Ambulance trust representative ☐
- (ii) Clinician ☐
- (iii) Patient representative ☐
- (iv) Commissioner ☐
- (v) Social Services ☐
- (vi) Stroke Network representative ☐
- (vii) Trust board member ☐

9.3 Do you have formal meetings with your coding department to improve the quality of stroke coding? **G** (Select only one option)

Yes ○ No ○

If yes to 9.3

9.3a How frequently are these formal meetings held? **G** (Select only one option – the one which is closest to the timeframe)

- (i) Weekly ○
- (ii) Monthly ○
- (iii) Quarterly ○
- (iv) Annually ○
- (v) Ad hoc/occasionally ○

9.4 Do you have "breach" meetings to review performance against SSNAP quality standards? (Select only one option)

Yes ○ No ○

If Yes to 9.4

9.4a How often are these meetings held? **G** (Select only one option)

- (i) Daily ○
- (ii) Weekly ○
- (iii) Monthly ○
- (iv) Quarterly ○
- (v) Annually ○

9.5 Do you have stroke specific mortality meetings within your Trust? (i.e. formal process to discuss all stroke deaths with stroke MDT team) **G** (Select only one option)

Yes ○ No ○

If yes to 9.5

9.5a Which format is used? **G** (Select only one option)

- Some deaths reviewed ○
- All deaths reviewed ○

9.6 Is there funding for external courses available for nurses and therapists? **G** (Select only one option)

Yes ○ No ○

9.7 How often is there a formal survey seeking patient/carer views on stroke service? *(This does not include the Friends and Family test)* (Select only one option)

- (i) Never ○
- (ii) Less than once a year ○
- (iii) 1-2 times a year ○
- (iv) 3-4 times a year ○
- (v) More than 4 a year ○
- (vi) Continuous (every patient) ○

Stroke audit

9.8 What is the total number of whole time equivalents (WTEs) allocated in your site for stroke data collection? [ ] WTEs

9.8a Which disciplines are covered by the WTEs for stroke data collection? (Select all that apply)

- Doctor ☐
- Manager ☐
- Nurse ☐
- Therapist ☐
- Clinical Audit/clinical Governance staff member ☐
- Data clerk/analyst with specific responsibility for stroke ☐
- Data clerk/analyst with general audit responsibilities ☐

Links with patients and carers

9.9 Does the Stroke service have formal links with patients and carers organisations for communication on any of the following? (Select only one option)

Yes ○ No ○

If yes to 9.9

9.9a Which areas are included (Select all that apply):

- (i) Service provision ☐
- (ii) Audit ☐
- (iii) Service reviews and future plans ☐
- (iv) Developing research ☐

9.10. Does the stroke service have formal links with community user groups for stroke? (Select only one option)

Yes ○ No ○

The proforma can be downloaded from the SSNAP Help Centre: https://ssnap.zendesk.com/hc/en-us/articles/360002468957-Acute-Organisational-Audit-2019-Proforma

Appendix 5: Summary of Denominators Used in the Report

Summary of denominators used in the report	
Total Number of Sites	169
Sites with 72h service	142
Sites where the stroke team review patients with suspected stroke out of hours	140
Site where there is review of brain imaging to inform decisions about thrombolysis/thrombectomy out of hours	141
Sites using telemedicine to allow remote access for the management of acute stroke care	93
Sites with type 1 bed	86
Sites with type 2 beds	105
Sites with type 3 beds	81
Thrombectomy only Sites	2
Sites in England	148
Sites in Wales	12
Sites Northern Ireland	8