NHS RightCare

RightCare Stroke Toolkit

Defining an optimal integrated system for the prevention and management of stroke

Practical advice and guidance for Integrated Stroke Delivery Networks (ISDNs) to support system wide improvement

Supported by

Different Strokes
Reclaiming lives after stroke

Stroke Association

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Stroke is the leading cause of **disability** and the **fourth largest cause of death** in the UK.

It is a **serious life-threatening** medical condition that occurs when the **blood supply** to part of the brain is **cut off**.

The **damage** this causes can affect the way a person's **body** works, as well as how they **think, feel and communicate**.

Summary

RightCare Stroke Toolkit

This RightCare toolkit will help support local health systems to understand the priorities in stroke prevention, identification, acute care, and rehabilitation, as identified in the Integrated Stroke Delivery Networks (ISDNs) National Stroke Service Model (NSSM).

Guides and resources are also provided to help local systems identify the greatest opportunities to reduce variation and improve population health at a local level. It is produced with reference to an expert group of stakeholders.

Introduction

Stroke is the leading cause of disability and the fourth largest cause of death in the UK. It is a serious life-threatening medical condition that occurs when the blood supply to part of the brain is cut off. The damage this causes can affect the way a person's body works, as well as how they think, feel, and communicate.

NHS Long Term Plan

The NHS Long Term Plan 2019 identified stroke as a priority area and highlighted the need for ISDNs, bringing people and organisations together to deliver the best possible care.

The NHS Long Term Plan outlines how we will work with partners to improve stroke care along the full pathway, from symptom onset to ongoing care. This includes prevention, treatment, and rehabilitation.

The Royal Colleges will also pilot a new credentialing programme for hospital consultants to be trained to offer mechanical thrombectomy.

The following are the ambitions, laid out in the NHS Long Term Plan, to improve stroke care along the full pathway:

- We will begin improved post-hospital stroke rehabilitation models, with full roll-out over the period of this Long Term Plan.
- We will deliver a ten-fold increase in the proportion of patients who receive a thrombectomy after a stroke so that each year 1,600 more people will be independent after their stroke.
- We will have amongst the best performance in Europe for delivering thrombolysis to all patients who could benefit.

Meeting these ambitions would result in the NHS having the best performance in Europe for people with stroke.

National Stroke Programme

The National Stroke Programme supports the health and care system to meet the ambitions set out in the NHS Long Term Plan.

It has been developed by NHS England, in consultation with clinical experts and people affected by stroke, and is supported by the Stroke Association.

The programme covers prevention, access to specialist stroke unit care, thrombolysis and thrombectomy treatment, Early Supported Discharge (ESD),and continuing specialist community rehabilitation as part of an Integrated Community Stroke Service (ICSS) model.

Long Term Plan

Rehabilitation

We will begin improved post-hospital stroke rehabilitation models, with full roll-out over the period of this Long Term Plan.

Thrombectomy

We will deliver a ten-fold increase in the proportion of patients who receive a thrombectomy after a stroke so that each year 1,600 more people will be independent after their stroke.

Thrombolysis

We will have amongst the best performance in Europe for delivering thrombolysis to all patients who could benefit.

Integrated Stroke Delivery Networks (ISDNs)

The overarching aim of an ISDN is to improve stroke care through effective delivery of high-quality stroke services, based on a network enabled by technology and supporting personalised care throughout every patient journey. ISDNs bring together providers and commissioners of services across the whole stroke pathway to facilitate a collaborative approach.

"*Integrated Stroke Delivery Networks (ISDNs) are the key vehicle for transforming stroke care across the country. Using a full-pathway approach, ISDNs will prevent thousands of patients suffering a stroke through improved diagnosis and access to treatment in 24/7 specialist stroke units. They'll also increase the availability of high-quality rehabilitation and ongoing community care to rebuild patients' lives after a stroke*"[1].

Twenty ISDNs, covering the whole of England have been in place since April 2021.

The average annual benefit of national pathway optimisation is estimated to be around £48 million. This takes into account any increased ambulance costs and transition costs, but also a reduction in staff costs and future tariff payments.

ISDNs use an evidence based, patient centred approach to delivering optimal stroke pathways aligned with the NHS's seven-day standards for stroke care.

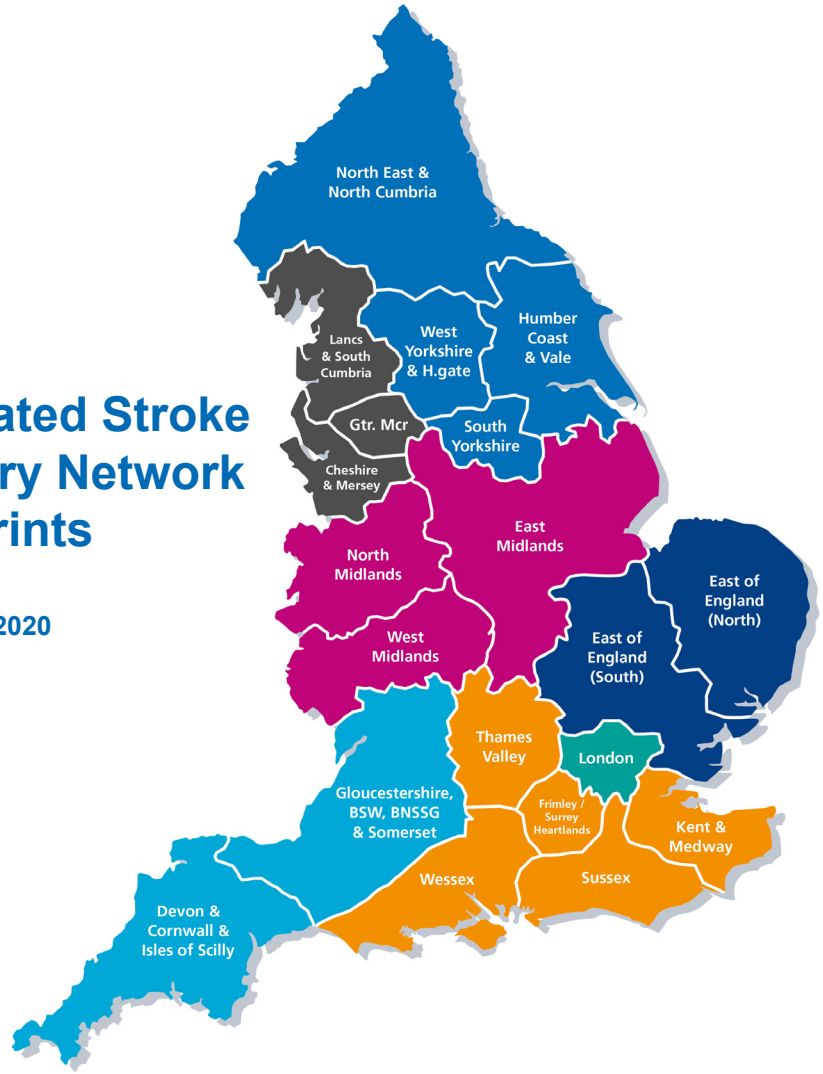
The NSSM was published in May 2021.

Key deliverables are:

- Best practice personalised stroke pathways, building to include the full pathway from prevention through to life after stroke.
- A flexible, future-proofed competency-based stroke workforce, supported by a skills and capabilities framework and toolkit.
- A comprehensive dataset describing the quality and outcomes of care provided.

This RightCare toolkit summarises the key actions identified in the NSSM to provide the optimal pathway for joined-up stroke care, enabled by technology, and supporting the delivery of personalised care throughout every patient journey.

Delivery of this optimal pathway within the period of the NHS Long Term Plan, ensures our patients benefit from world class care.



1. *Steve Powis, National Medical Director, NHS England and NHS Improvement; Deborah Lowe, NCD for Stroke NHS England and NHS Improvement; David Hargroves, National Clinical Lead for Stroke, NHS England and NHS Improvement; Juliet Bouverie, Chief Executive Officer, Stroke Association*

Data

The NHS Long Term Plan ambition is to improve stroke care along the whole pathway. To measure the success of the Long Term Plan it is fundamental that we have access to high quality, timely data, covering the whole pathway.

RightCare

NHS RightCare is a national programme that provides data and tools to help systems identify opportunities to improve patient care and experience, and reduce unwarranted variation and health inequalities. The delivery methodology is based around three simple principles – Diagnose, Develop, Deliver – to improve population health.

The Diagnose stage starts with a review of indicative data to identify opportunities to reduce unwarranted variation and improve population health. RightCare has been working with stakeholders to develop a range of key stroke metrics that can be used regionally and at ISDN level, for the purposes of prioritisation, progress monitoring, and assurance.

These metrics include prevalence, primary care, secondary care, outpatients, and mortality and include both activity and spend. RightCare gather this information from a range of sources including, Quality and Outcomes Framework (QOF), Sentinel Stroke National Audit Programme (SSNAP), Business Servicers Authority (BSA), and Secondary Uses Service (SUS).

RightCare stroke datapacks can be requested via rightcare@nhs.net.

GIRFT

Getting It Right First Time (GIRFT) stroke data packs provide hard evidence of the variation across all acutely admitting stroke units. 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.

These packs draw on a range of sources including SSNAP, Hospital Episode Statistics (HES), and the Diagnostic Imaging Dataset (DID). Although the GIRFT programme focuses upon the acute end of the pathway, the latest report – GIRFT Programme National Specialty Report for Stroke – takes a more whole pathway view and has looked at networked delivery models when making its final recommendations to the system.

While the SUS database is continually updated, HES data is a snapshot of SUS data that is taken on a monthly basis. SUS data includes more access restrictions.

NHS Digital

NHS Digital provide information to the health service, creates and maintains the technological infrastructure, and develops information standards. Data from a wide spectrum of NHS services is covered including primary and secondary care, prescribing, screening, referrals, NHS workforce, and COVID-19 vaccinations.

SSNAP

SSNAP is a major national healthcare quality improvement programme which measures the structure of stroke services and the processes of care provided to stroke patients against evidence-based standards, covering England, Wales, and Northern Ireland.

The overall aim of SSNAP is to provide timely information on how well stroke care is being delivered so it can be used as a tool to improve the quality of care that is provided to patients. The latest Eighth SSNAP Annual Report covers stroke care received between April 2020 and March 2021.

Continue next

Data

Epidemiology and aetiology

Stroke is the leading cause of disability and fourth largest cause of death in the UK[2]. The risk of stroke increases with age but can happen at any age, with approximately one third of strokes occurring in people under 70 years, and over 200 children under 10 years admitted to hospital each year in England for stroke[3]. Data for 2019/20 suggests that 1.8% of adult GP registered patients in England have experienced a stroke or Transient Ischaemic Attack (TIA) at some point[4].

Stroke is more common in black people, who are at 1.5 to 2.5 times greater risk of having a stroke than white people. South Asian people also have a stroke risk about 1.5 times greater than white people, particularly in Pakistani and Bangladeshi groups. In contrast, people from the Chinese ethnic group have a lower risk of stroke than the white population[5].

The following are from the RightCare stroke datapacks 2019/20 and relate to the 135 Clinical Commissioning Groups (CCGs) within England, as at 2019/20 (available via FutureNHS and Model Health System).

Prevention

Most strokes are preventable through the identification and treatment of conditions and risk factors for stroke, such as atrial fibrillation (AF) and lifestyle.

- Nearly half a million (93%) AF patients had their stroke risk assessed, using the CHA2DS2-VASc score risk stratification scoring system, in the preceding 12 months. This varied from 85% to 99% across CCGs.
- Anticoagulation drug therapy for AF patients varied from 82% to 93% across CCGs. If all significantly underperforming CCGs – i.e. compared to their best five most similar 10 CCGs – were able to increase their percentage to match the average of their best five 20K more AF patients would receive anticoagulation.
- Anti-platelet anti-coagulant medication for those who have experienced a TIA or non-haemorrhagic stroke ranges from 88% to 93% across CCGs. A further 5.6k patients would receive these preventative medications if all underperforming CCGs were to increase their prescribing to match their best five most similar 10.

Acute care

Around 85,000 people a year are admitted to hospital with a stroke.

- Thrombectomy and thrombolysis can significantly reduce disability severity. Just over 11% of all stroke patients received thrombolysis. Between CCGs this varied from 3% to 24%. A further 1.6k stroke patients would receive thrombolysis if all under performing CCGs were to match the rate of their best five.
- Stroke patients should have access to a stroke unit within four hours of hospital arrival, and for over 90% of their acute stay. Just over half (56%) of stroke patients were admitted directly to a stroke unit within four hours. Between 67% and 96% of patients admitted to hospital following a stroke spent 90% of their time on a stroke unit. A further 7.9k stroke patients would be admitted to a stroke unit within four hours and nearly 4k patients would stay for at least 90% of their hospital stay if all underperforming CCGs were to match the percentage of the best five of their most similar 10.

Rehabilitation

There are over 1 million stroke survivors in England, more than half of whom have a disability resulting from their stroke[6].

- ESD was received by 43% of patients, with only 9% of patients receiving a six month follow-up assessment. A further 11.2k patients would receive ESD support and 15.3K would receive six month follow-up if all underperforming CCGs moved to the average of their best five similar 10 CCGs.

2. ONS. Leading causes of death, UK: 2001 to 2018. March 2020. https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/causesofdeath/articles/leadingcausesofdeathuk/2001to2018

3. NHS Digital Hospital admissions with a primary diagnosis of stroke 2016/17 to 2020/21. https://digital.nhs.uk/supplementary-information/2021/hospital-admissions-with-a-primary-diagnosis-of-stroke-2016-17-to-2020-21

4. NHS Digital QOF results 2019/20 https://digital.nhs.uk/data-and-information/publications/statistical/quality-and-outcomes-framework-achievement-prevalence-and-exceptions-data

5. Sewell et al (2021)Commission on Race and Ethnic Disparities: The Report https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/974507/20210331_-_CRED_Report_-_FINAL_-_Web_Accessible.pdf

6. NHS England's work on stroke https://www.england.nhs.uk/ourwork/clinical-policy/stroke/

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Research and evidence

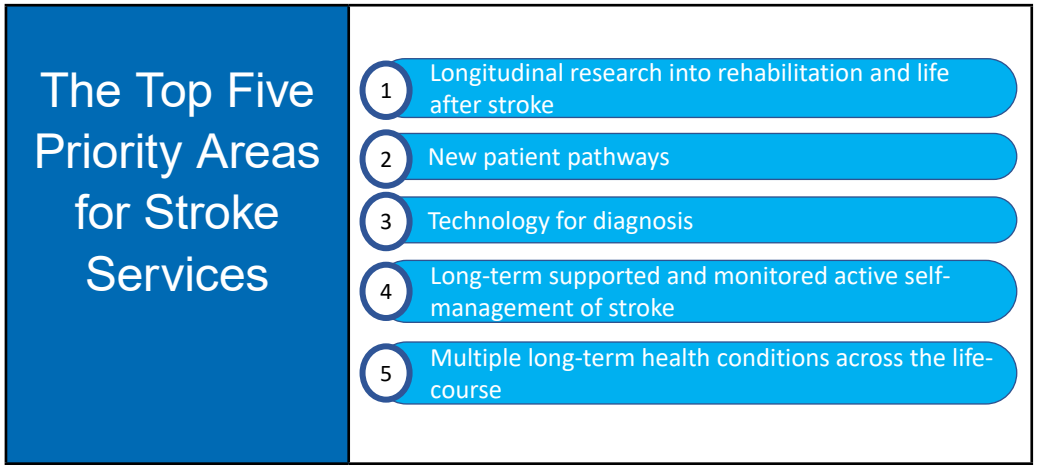
Supporting and applying research in the NHS

Research activity is increasingly a core business for the NHS. Patients benefit from research and innovation, with breakthroughs enabling prevention of ill-health, earlier diagnosis, more effective treatments, better outcomes, and faster recovery.

Demand Signalling

Research and Innovation Demand Signalling is the process of identifying, prioritising, and articulating the most important research questions and innovation challenges that NHS services need to address to deliver against the ambitions set out in the NHS Long Term Plan.

In July 2019 and February 2021 a set of Demand Signalling workshops were undertaken. Clinicians, academics, policy experts, and people with lived experience from the stroke community together identified areas of high priority where more research and innovation is needed to support the future vision for stroke services:



These priority research questions from the demand signalling process are included in the appropriate reference sections within this RightCare Stroke Toolkit and should help guide prospective research and influence funding calls.

Evidence Review

In 2020 NHS England Stroke Programme commissioned an evidence gap analysis to summarise what we currently know and what we don't know across the breadth of the care pathway, so as to inform providers and national policymakers of what needs to be achieved to deliver world class services equitably across England.

A review was undertaken by academics and stroke clinicians who all have expertise in stroke and reviewing the literature covering the whole pathway, from prevention to long term care. This review was published in December 2020 (available here, FutureNHS login required) and summarises what is known, and what is not known, about the kinds of care that are beneficial to patients across the whole stroke care pathway. In response to this review:

- Local commissioners should ensure they provide the types of care which demonstrates strong evidence of clinical benefit.
- The research sector should direct its attentions to the areas of the stroke pathway that are identified as being under-evidenced.
- Strategic system planners should endeavour to invest funds in order to help the research sector to do the above.

COVID-19

Although COVID-19 is recognised within this RightCare toolkit it is not a tool to support the treatment of COVID-19.

Please refer to the following links for Covid specific guidance:

- AHSN/GIRFT Restoration and Recovery and Adapting stroke services : These guides support stroke teams in the restoration and recovery phase of the COVID-19 pandemic.
- NICE guideline [NG191] COVID-19 rapid guideline: managing COVID-19.
- StrokeAssociation: Provide information on coronavirus. Stroke recoveries at risk explores how the COVID-19 pandemic has affected stroke survivor's.

Reducing inequalities in stroke care

The unwarranted variation in stroke care may inversely impact different groups within society. The COVID-19 pandemic has exaggerated these differences and it is acknowledged that this variation is avoidable and a key priority of the NHS in its recovery from the pandemic.

Throughout this RightCare toolkit we have highlighted areas for improvement across the whole pathway, supporting the concept that excellence in care should be available to all.

Merely acknowledging there are health inequalities that exist is not enough. It is the responsibility of us all to actively seek out inequalities in stroke care and put in processes that mitigate and diminish them. This is not straightforward and will require coordination within and between system partners to ensure meaningful change. Central funding to ISDNs has been secured for local systems to implement programmes of work that specifically address the inequalities in stroke care that exist today for those that are most vulnerable.

Locally assessing the impact of intervening in some of the 37 opportunities listed in the stroke-specific health inequalities framework (provided on the right) can be used to prioritise funding and target those most in need. This framework identifies different areas of potential inequality and suggests metrics for identifying needs and tracking impact.

An NHS England health inequalities improvement programme (Core20PLUS5) will see each Integrated Care System (ICS) have a designated Health Inequalities Lead. It is recommended that each ISDN coordinate their health inequalities work with their ICS Health Inequalities Leads.

Stroke Specific Health Inequalities Framework

Targeting variation in those groups with...

...the highest prevalence of **risk related behaviours**:

1) Smoking
2) Poor nutrition
3) Excess alcohol consumption
4) Recreational drug use
5) Limited exercise
6) Healthy living illiteracy

...the highest prevalence of **conditions with aetiological association for stroke**:

1) Hypertension
2) Atrial fibrillation
3) Hypercholesterolaemia
4) Diabetes
5) Other vascular diseases

...the worst **access to specific elements of the stroke care pathway**:

1) Prehospital
2) Admission to CSC/ACS*
3) Personalised information
4) Psychology intervention
5) Admission to Integrated Community Stroke Service (ICSS) compliant service
6) Six week and six month follow-up
7) Vocational rehabilitation
8) Digital exclusion

*Comprehensive Stroke Centre (CSC)/Acute Stroke Centre (ASC)

...the worst reported **experience of care**:

1) Prehospital
2) HASU/ASU*
3) Inpatient rehabilitation
4) Integrated Community Stroke Service
5) Life after stroke care and follow-up

** Hyper Acute Stroke Unit (HASU)/ Acute Stroke Unit (ASU)*

...the worst **quality of care**:

1) Prevention
2) Prehospital
3) HASU/ASU
4) Inpatient rehabilitation
5) Integrated Community Stroke Service
6) Psychological intervention
7) Life after stroke care and follow-up

...the highest prevalence of the **wider determinants of increased stroke prevalence or known worse stroke care/access/experience**:

1) Geographic
2) Pollution
3) Groups specifically protected under law (e.g. age, sex, race, disability)
4) Social economic
5) Socially excluded groups (e.g. through language, homelessness)

Care should be available to all regardless of location, held beliefs, distinguishable characteristics, financial status, and education attainment

RightCare toolkit on a page

System Improvement Priorities

0. Health inequalities

1. Prevention

- 1.1 Identifying those at risk
- 1.2 Primary prevention measures
- 1.3 Secondary prevention measures
- 1.4 Immediate response to stroke symptoms

2. TIA management

- 2.1 Initial management of TIA
- 2.2 Recurrent TIA

3. Pre-hospital

- 3.1 Optimising 999 call response
- 3.2 Assessments required en route
- 3.3 Transfer to an acute or comprehensive stroke centre

4. Hyper acute and acute care

- 4.1 Requirements of the service
- 4.2 Management pre-diagnosis
- 4.3 Management at diagnosis
- 4.4 Rapid access to appropriate imaging
- 4.5 Assessments post diagnosis
- 4.6 Intracerebral haemorrhage management
- 4.7 Thrombolysis management
- 4.8 Thrombectomy management
- 4.9 Vascular or neuro surgical interventions
- 4.10 Prevention of complications of stroke
- 4.11 Continence management
- 4.12 Swallowing and nutrition management
- 4.13 End of life care
- 4.14 Discharge planning

5. Rehabilitation and life after stroke

- 5.1 Inpatient rehabilitation
- 5.2 Psychological services
- 5.3 Vocational services
- 5.4 Integrated Community Stroke Services (ICSS) including Early Supported Discharge (ESD)
- 5.5 ICSS pathways
- 5.6 Intensity and responsiveness
- 5.7 Follow-up reviews
- 5.8 Life after stroke (LaS) services
- 5.9 Performance monitoring

6. Workforce

7. Medicines optimisation

8. Technology

Self-assessment questionnaire

System improvement priority: 0. Health inequalities

Promoting equality and addressing health inequalities are at the heart of NHS values. As part of the response to COVID-19 the NHS is being asked to deliver urgent action to tackle health inequalities, at both national and system level[7].

Funding is secured for ISDNs to identify and reduce stroke specific health inequalities within their area; working in partnership with their ICS Health Inequalities Lead(s) and other relevant health inequalities stakeholders, and using the stroke-specific health inequalities framework (Page 8) and Core20Plus5[8].

Key areas for focus	Actions to take	Guidance and best practice
0.1 Collaboration	• ISDNs need to identify and engage with their locally appointed ICS designated Health Inequalities Lead(s) and other relevant health inequality stakeholders. • We would recommend a health needs assessment, covering the whole stroke pathway – from prevention to rehabilitation and life after stroke – be undertaken in collaboration with the Health Inequalities Lead(s) to identify the most vulnerable groups within local areas and across systems, using the Core20Plus5 and the stroke specific health inequalities framework (page 8).	
0.2 Identifying priorities	• ISDNs need to agree a programme of work with their local ICS Health Inequalities Lead(s) to specifically address the inequalities in stroke care for their population.	
0.3 Monitoring	• A plan of action to collect disaggregated health inequalities data – relating to access, experience, and outcomes – as part of the programme of work needs to be agreed and actioned, using the Health Inequalities dashboard to support this where applicable. • Key locally defined measurable performance targets, which can demonstrate achievements in reducing inequalities in stroke care for the local population, should be agreed at the planning stage. • Progress with these health inequalities programmes of work need to be formally monitored, with timelines and risks agreed.	

7. NHS England. 2021/22 priorities and operational planning guidance. March 2021 https://www.england.nhs.uk/publication/2021-22-priorities-and-operational-planning-guidance/

8. Core20PLUS5 – An approach to reducing health inequalities. November 2021 https://www.england.nhs.uk/about/equality/equality-hub/core20plus5/

System improvement priority: 1. Prevention

As much as 90% of stroke disease may be preventable through treating key risk factors including hypertension, hypercholesterolaemia, AF, poor diet, obesity, smoking and lack of physical exercise[9,10]. Prevention is a key priority in the NHS Long Term Plan, with an ambition to help prevent 150,000 strokes, heart attacks, and cases of dementia over the next ten years by improving the identification and management of these high-risk factors.

All health care practitioners involved in stroke care should ensure that risk factors are screened for, patients are offered appropriate interventions with regular follow-up, and secondary prevention is considered. There should be a clear focus on communication with patients, their relatives or carers, and others involved in their care, with attention paid to those from the seldom heard groups.

Refreshed public awareness raising around common stroke symptoms[11] can also enable earlier better-informed 999 calls, ensuring earlier medical attention and reducing the likelihood of serious consequences.

Key areas for focus	Actions to take	Guidance and best practice
1.1 Identifying those at risk	• Primary care organisations should ensure they have a strategy in place to identify people at risk of stroke, prioritising risk assessments in patients with cardiovascular disease (CVD) risk factors, including both non-modifiable (age, ethnicity, sex, and genetics), and modifiable (poor diet, being overweight, smoking, inactivity, dyslipidaemia, and hypertension) risk factors. • The Cardiovascular Disease Prevention Audit (CVDPREVENT), CVD Directed Enhanced Service (DES) and Proactive Care@home /NHS@home should be used to support the identification of patients at risk. • Every patient contact with every clinician should be seen as an opportunity to reduce the risk of CVD. • Regional CVD-R boards to understand prevention work that is underway within the region and ensure a joined up approach with Cardiac, Respiratory, and Stroke Networks. • General practitioners should maintain an up-to-date register of people who have had a stroke or TIA, as part of the Quality Outcome Framework reporting requirements for stroke and TIA management.	

9. NICE Cardiiovascular disease prevention [PH25] 2010. https://www.nice.org.uk/guidance/PH25

10. Cardiovascular disease: risk assessment and reduction, including lipid modification [CG181] 2016 https://www.nice.org.uk/guidance/cg181

11. Act F.A.S.T campaign. https://www.gov.uk/government/news/relaunch-of-the-act-fast-campaign-to-improve-stroke-outcomes

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System improvement priority: 1. Prevention

Key areas for focus	Actions to take	Guidance and best practice
1.2 Primary prevention measures	• Primary care should seek to advise people identified as high risk about lifestyle modifications. • The uptake of the NHS Health Checks should continue to be supported. • Telephone outreach should be considered to encourage people from deprived and Black, Asian, and minority ethnic (BAME) communities to attend, as the burden of CVD is greater on these communities. • Clear protocols should be in place for blood pressure lowering, lipid management and anticoagulation therapy which should include keeping hypertension registers and AF registers up to date. • Statin therapy should only be offered to patients at risk of stroke after lifestyle modification has been considered and the patient makes an informed decision after the risks and benefits of statin treatment are discussed.	
1.3 Secondary prevention measures	• Patients with non-disabling stroke or TIA should receive treatment for secondary prevention, in line with best practice, as soon as the diagnosis is confirmed. This may include provision of antiplatelets, statin, anticoagulation, or blood pressure medication, as appropriate. • Written information and advice regarding stroke risk, secondary prevention, and advice regarding driving, flying, and activity should be provided to the patient and their family or carers. • Timely access to out-patient diagnostics to identify aetiology of stroke or TIA should be available. • All patients who have experienced a cryptogenic stroke should be discussed at a regional multidisciplinary meeting (MDM), which includes relevant experts in attendance. • Support with adherence and persistence with medication and lifestyle modification should be available. • Adherence should be monitored at six weeks and six months post hospital discharge and then annually thereafter.	
1.4 Immediate response to stroke symptoms	• National strategies to ensure that the public can recognise when a person has a suspected stroke or TIA and respond appropriately, such as the F.A.S.T. test, should be in place. • Commissioners should implement a professional training strategy for emergency personnel (e.g. staff in emergency call centres) to ensure that emergency personnel can recognise when a person has a suspected stroke or TIA and respond appropriately, in line with NICE guidelines [NG128].	

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System improvement priority: 2. TIA management

Transient ischaemic attack (TIA) is a temporary period of transient neurological dysfunction caused by focal brain, spinal cord, or retinal ischaemia, without evidence of acute infarction. Patients with TIAs usually have symptoms that last only a few minutes but are similar to those of a stroke. They may sometimes be referred to as mini strokes by the general population. In the UK, first-ever TIA occurs in about 50/100,000 people per year. Once a person has had a stroke or TIA they are at higher risk of a further vascular event[12].

TIA services should provide a full and rapid diagnostic assessment urgently, without risk stratification, and within 24 hours of referral. This applies only to patients that have been triaged and are deemed likely to have had a TIA, all other patients that require review should be seen within one week or signposted to more appropriate clinics. Vessel and brain imaging should be on the same day as the assessment as required; using magnetic resonance imaging (MRI) for brain imaging, as per NICE guidance.

Key areas for focus	Actions to take	Guidance and best practice
2.1 Initial management of TIA	• Offer aspirin 300 mg immediately unless contraindicated — give a proton-pump inhibitor to anyone who is likely to suffer with dyspepsia associated with aspirin use. Advise people already taking low dose aspirin regularly to continue — do not offer them aspirin 300 mg[12] • All patients who have been triaged and are deemed likely to have had a TIA, should be assessed, diagnosed and treated within 24 hours of initial contact, via a 365-day service. • Patients who present to NHS services reporting a suspected TIA that occurred more than a week previously should be assessed by a specialist clinician as soon as possible, at least within seven days. • All other patients that require TIA review should be seen within one week or signposted to more appropriate clinics. • The practice of triaging patients according to risk stratification tools, e.g. ABCD2, should discontinue. • Vessel and brain imaging should be on the same day as the assessment as required; using MRI preferentially for brain imaging. • Computerised tomography (CT) brain scanning should not be offered to people with a suspected TIA unless there is clinical suspicion of an alternative diagnosis that CT could detect. • All patients likely to benefit from intervention should have significant symptomatic carotid artery stenosis and atrial fibrillation excluded on the same day as assessment.	

12. NICE (2020) Stroke and TIA: Summary. https://cks.nice.org.uk/topics/stroke-tia/

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System improvement priority: 2. TIA management

Key areas for focus	Actions to take	Guidance and best practice
2.2 Recurrent TIA	• Do not treat recurrent TIA in patients in sinus rhythm with anticoagulants. Ensure prolonged cardiac monitoring to confidently exclude AF/paroxysmal AF if initial recording shows sinus rhythm. • Investigate for carotid stenosis and paroxysmal AF before considering unusual causes of TIA or an alternative diagnosis.	

12. NICE (2020) Stroke and TIA: Summary. https://cks.nice.org.uk/topics/stroke-tia/

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System improvement priority: 3. Pre-hospital

A faster emergency response to stroke reduces mortality and disability – “time is brain”.

The accurate identification of potential stroke and TIA patients and their timely assessment and treatment is a critical stage of the care pathway, which can be supported by increased professional training, and by communication technologies.

The new ambulance standards[13] implemented by NHS England in 2017, updated a decades old system and provided the ambulance service with a strong foundation for the future, helping to ensure the sickest patients get the fastest response and that all patients get the right response first time.

Key areas for focus	Actions to take	Guidance and best practice
3.1 Optimising 999 call response	• A "Category 2" 999 response should be assigned where suspected stroke onset occurred in the previous 4.5 hours. Where suspected stroke onset occurred outside of this symptom onset time window a category 3 response should be assigned. (*Note: National work is ongoing to examine the evidence base aimed at any recommendations for changes to 999 call categorisation with a view to catergory 2 calls for all patients last known well in the previous 10 hours*). • 999 call to hospital door time should be as short as possible. There is a clear link between getting patients to a stroke unit quickly and improved quality of care and improved outcomes for the patient. • For patients with ischaemic stroke, systems should achieve a 90th centile call to needle time of 180 minutes. • Action plans should be agreed to improve ambulance response and reduce on-scene times.	
3.2 Assessments required en route	• Patients should be screened using a validated screening tool, e.g. F.A.S.T. test. • All suspected stroke patients should be assessed and managed in accordance with best clinical practice. This includes monitoring for AF and other dysrhythmias, but this should not delay rapid conveyance to the nearest stroke centre. • Pre-hospital triage support, via telemedicine and linked to a senior stroke clinician, should also be considered to enable early identification of possible thrombolysis or thrombectomy patients.	

13. Improving ambulance services. https://www.england.nhs.uk/urgent-emergency-care/improving-ambulance-services/arp/

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System improvement priority: 3. Pre-hospital

Key areas for focus	Actions to take	Guidance and best practice
3.3 Transfer to an acute or comprehensive stroke centre	• Where acute stroke is suspected, patients should be transferred immediately by ambulance to their nearest stroke centre. • Identifying the most appropriate acute stroke receiving centre should be underpinned by clear local arrangements and ideally supported by technology, underpinned by agreed pathways. • Direct to scan protocols should be developed to support immediate CT/ Computed Tomography Angiography (CTA)/CT perfusion scanning (CTP - where appropriate) and secondary conveyance to a Comprehensive Stroke Centre (CSC) if thrombectomy is indicated. • For a cohort of patients, telemedicine may also support diagnosis en route from senior stroke clinicians, offering more specialist triage and either avoiding or better specifying onward conveyance.	

System improvement priority: 4. Hyper acute and acute care

There is strong evidence that acute treatment at specialised stroke units, offering rapid access to the range of appropriate assessments and multidisciplinary expertise and intervention, is associated with lower mortality and lower rates of post-hospital disability[14].

Hyper acute stroke care services are delivered in Acute Stroke Centres (ASC) or Comprehensible Stroke Centres (CSC) and bring together expert clinical assessment, rapid brain imaging, and access to physiological monitoring and urgent care, 24 hours per day, seven days per week. Acute stroke care immediately follows the hyper-acute phase, usually after the first 72 hours from admission. Acute stroke care services continue to provide specialist input, with daily multidisciplinary care, and access to stroke trained consultant care, physiological monitoring, and urgent imaging, as required.

There is strong consensus between NICE[15] and Royal College of Physicians (RCP)[16] guidelines on the minimum standards that should be met around workforce, time to treatment, diagnostic tests, and rehabilitation, to ensure patients with suspected stroke receive rapid access to high quality acute impatient care.

Key areas for focus	Actions to take	Guidance and best practice
4.1 Requirements of the service	• Acute and hyper acute stroke care must be available 24 hours per day, seven days per week, as part of networked provision. • Consultant or equivalent level ward rounds should be undertaken seven days a week for all patients within the first 72 hours of their stroke event and five days a week when medically stable. • A multidisciplinary team (MDT) delivering physiotherapy, occupational therapy, and speech and language therapy should be available seven days per week, with five day access to other specialists such as dietetics. • Protocols should be in place to ensure appropriate monitoring and reporting of all patients by stroke trained staff.	
4.2 Management pre-diagnosis	• All patients who present to hospital (including self/GP/ambulance referrals) with suspected stroke should be admitted to a hospital with an ASC or CSC service. • Patients with suspected stroke should receive immediate, structured assessment by appropriately trained staff in a consultant-led team to determine diagnosis and suitability for thrombolysis, thrombectomy, intra cerebral hemorrhage intervention, rehabilitation, and ongoing care needs.	

14. Langhorne P, Ramachandra S. Organised inpatient (stroke unit) care for stroke: network meta-analysis. Cochrane Database of Syst Rev. 2020; 4:CD000197. doi: 10.1002/14651858.CD000197.pub4 https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD000197.pub3/full

15. NICE guideline 128. https://www.nice.org.uk/guidance/ng128

16. RCP National Clinical Guideline for stroke 2016 https://www.strokeaudit.org/Guideline/Full-Guideline.aspx

Continue next

System improvement priority: 4. Hyper acute and acute care

Key areas for focus	Actions to take	Guidance and best practice
4.3 Management at diagnosis	• Newly diagnosed stroke patients should have access to highly specialised stroke units within four hours of arriving at hospital, and for over 90% of their stay in an acute setting. • Patients diagnosed with acute stroke should be assessed and treated as the highest priority of medical emergency, in line with emergency protocols. • Newly diagnosed patients should be seen by a stroke specialist clinician within 60 minutes of arrival, either face to face or remotely, and face to face within 14 hours.	
4.4 Rapid access to appropriate imaging	• The stroke service should have access to onsite brain imaging (MRI and CT), vessel imaging – including ultrasound, Magnetic Resonance Angiography (MRA), and CT Angiography (CTA), – thrombectomy, neurosurgery, vascular surgery for carotid endarterectomy; if not on site, agreed protocols must be in place for rapid access. • Rapid multi-modal brain imaging (CT or MRI) must be available onsite 24 hours per day, seven days per week, with skilled radiological clinical interpretation, supported, where necessary and appropriate, by off-site expertise and artificial intelligence (AI) decision support tools. • ISDNs should ensure that there is an agreement in place with regional diagnostic networks to work towards delivery of the National Optimal Stroke Imaging Pathway (NOSIP). This is likely to be a stepped approach to delivery. • Image sharing between centres within and external to each ISDN should be optimised. • Patients with a clinically suspected acute stroke and eligible for recannulisation therapy should receive a CT head and CTA within 20 minutes, with consideration for a computed tomography perfusion (CTP) at the same sitting, if clinically indicated e.g. Stroke of Uncertain Time of Onset. • Patients presenting with acute very mild stroke symptoms, or where there is significant diagnostic uncertainty, should receive an MRI, including T1, T2, DWI and Haem sequences with one hour. This may not be available 24 hours per day initially although attempts at day time access is strongly encouraged.	

System improvement priority: 4. Hyper acute and acute care

Key areas for focus	Actions to take	Guidance and best practice
4.5 Assessments post diagnosis	• Following initial assessments, all patients should be seen by a consultant or equivalent, as part of a daily decision-making ward round during the first 72 hours of admission to the hyper-acute stroke service. • Protocols must be in place to ensure the appropriate monitoring of stroke patients by stroke trained staff for all patients in the hyper acute phase. • All assessments by specialist therapists (physiotherapist, occupational therapist, speech and language therapist) should be carried out within 24 hours of admission. • Appropriate assessments by other specialist therapists, such as dietician or orthoptist, should be undertaken within 72 hours.	
4.6 Intracerebral haemorrhage management	• Evidence-based medical management of intracerebral haemorrhage must be available 24 hours per day, seven days per week. • Patients with intracerebral haemorrhage should receive appropriate treatment within the first hour of reaching hospital, including, anticoagulation therapy reversal and lowering blood pressure (ABC bundle of care). • Regular neurological observation should be undertaken. • Repeat brain imaging should be available 24 hours per day, seven days per week and undertaken within an hour of further deterioration. • Intensive therapy units to support cardiorespiratory and renal systems should be considered. • Clear guidelines must be in place, in line with current guidance, on the appropriate referral of patients to neurosurgical centres, with consideration given to location and calculation of intracerebral volume (using ABC/2 model) and ICH score.	
4.7 Thrombolysis management	• An appropriate protocol should be in place to enable swift screening of patients for thrombolysis. • Intravenous thrombolysis should be available 24 hours per day, seven days per week. • Appropriate stroke patients to be scanned, assessed by a stroke specialist, and if appropriate receive thrombolysis, ideally within 20 minutes and at least within 60 minutes of admission (door to needle time).	

System improvement priority: 4. Hyper acute and acute care

Key areas for focus	Actions to take	Guidance and best practice
4.8 Thrombectomy management	• All potential thrombectomy patients should have a CTA performed with their initial brain scan. • Thrombectomy should be provided to all appropriate patients as soon as possible, to maximise benefit to patient outcomes. This includes people who were last known to be well between six hours and 24 hours previously (including wake-up strokes with CTP assessment as clinically indicated). • Emergency intra-hospital thrombectomy transfer pathways, with established repatriation flows agreed and supported by the whole system, must be in place and available 24 hours per day, seven days per week. • Transfer decisions for thrombectomy patients should be completed within 20 minutes of hospital arrival so that the initial ambulance team may continue their transfer to a CSC. Pathways which include pre-notification of arrival will help support this. • Where a new ambulance is needed to transfer a patient for thrombectomy, this should be treated at least as a category 2 call or time-critical transfer. • ISDN plans with clear milestones should be developed to monitor progress. • Progress towards milestones should be discussed by the ISDN at least quarterly.	
4.9 Vascular or neuro surgical interventions	• Clear protocols, with agreed access, should be in place for the effective and timely referral of patients to vascular or neurosurgical centres, to ensure that patients suffering a stroke receive the most appropriate care as early as possible. • Networks must ensure that there is immediate availability of images to relevant providers of these services. • All patients with a suspected non-disabling stroke or TIA must have urgent access to comprehensive vascular and neuro surgical services with, where required, carotid intervention performed within seven days of symptom onset of a stroke or TIA. • Patients with a non-disabling stroke or TIA who require carotid endarterectomy should be admitted for urgent investigation and surgery within 48 hours of diagnosis. • Patients at risk of malignant middle cerebral artery syndrome should be referred to a neurosurgical centre within 24 hours of symptom onset	

System improvement priority: 4. Hyper acute and acute care

Key areas for focus	Actions to take	Guidance and best practice
4.10 Prevention of complications of stroke	• Protocols for the management of the common complications of stroke including urinary sepsis, pneumonia, venous thromboembolism (VTE), and falls should be in place. • All stroke units should have a designated antimicrobial stewardship lead. • All stroke patients should have a regular review of their VTE risk and management, based on changes in mobility and time since stroke event, using a stroke specific decision support aid (Healthcare Safety Investigation Branch). • Appropriate prescription or administration of Intermittent Pneumatic Compression should be provided, in accordance with NICE guidelines [NG89]. • Patients should have their falls risk assessed and, where required, a personalised falls prevention programme developed which transfers with the patient, in line with NICE guidelines [CG161]. • Patients who require only minimal support to mobilise should be offered mobilisations within 24 hours.	
4.11 Continence management	• Protocols should be in place for the promotion of bladder and bowel continence. • A policy to avoid the use of urinary catheters where possible should be in place. • A policy, following NICE guidelines [CG179], should be in place for the prevention of pressure sores. • Stroke survivors with continued loss of bladder control two weeks after diagnosis should be reassessed and a joint agreement, involving both patients and carers, on ongoing treatment agreed.	

System improvement priority: 4. Hyper acute and acute care

Key areas for focus	Actions to take	Guidance and best practice
4.12 Swallowing and nutrition management	• A swallow screening assessment should be undertaken within four hours of arrival. • All patients should be screened for malnutrition at least weekly. • A dysphagia management service must be available. • Patients who are unable to take adequate nutrition, fluids, and medication orally should, where appropriate, receive tube feeding, with the method based on diagnosis and tolerance. • Patients with prolonged dysphagia should receive definitive feeding solutions within three days of referral. • Nutritional support for patients requiring tube feeding should be guided by a specialist therapist and be based on assessment and monitoring.	
4.13 End of life care	• End of life patients should be assessed and have access to specialist palliative care services, as appropriate. • A standard model of end of life care should be followed such as the Gold Standard framework for End of Life Care.	
4.14 Discharge planning	• A formal discharge summary report, including a joint health and social care plan, must be completed and shared with the referrer, GP, social care and stroke survivor, with a named person to contact (if requested) on the day of transfer of care, to ensure coordinated and effective care. • All patients should leave hospital with a personalised stroke information pack that summarises important information for stroke patients and their carers about their stroke, agreed goals, onward referrals and stroke care pathway. This may enhance the role of life after stroke support services in signposting and promotion of individual and personalised care planning. • The inpatient discharging team should refer the patient to a stroke key worker Life after Stroke (LaS) service before discharge to ensure all patients have access to a key worker on discharge. • Any equipment required should be available at the person's residence on discharge.	

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System improvement priority: 5. Rehabilitation and life after stroke

Stroke rehabilitation is a multidimensional process, which is designed to facilitate restoration of, or adaptation to, the loss of physical, psychological, cognitive, and social function.

The most effective form of rehabilitation for stroke survivors has shown to be a timely, high-intensity, coordinated multidisciplinary team approach[17]; working in partnership with the stroke survivor and those important to them so they can maximise their recovery, their independence and their overall quality of life.

RCP[18] and NICE[19] guidelines make clear the importance of both inpatient and community stroke rehabilitation services. An integrated service ethos should be fostered between NHS, social care, and voluntary sector care delivery to ensure equity of service, access and experience across the stroke pathway, providing a seamless experience for stroke survivors and those that care for them, irrespective of their post code or social background.

Key areas for focus	Actions to take	Guidance and best practice
5.1 Inpatient rehabilitation	• People with disability after stroke should receive inpatient rehabilitation in a dedicated stroke inpatient unit. • Patients must have a rapid initial multidisciplinary assessment to begin building an initial personalised rehabilitation plan, which must then commence as soon as clinically appropriate. • High quality rehabilitation therapy should be offered seven days a week to all patients and by all required core disciplines, at an appropriate intensity to meet each individual's rehabilitation goals.	
5.2 Psychological services	• Psychological and neuropsychological rehabilitation should be accessible throughout the stroke care pathway for patients who need it. • Patient's psychological needs should be considered throughout the rehabilitation process.	
5.3 Vocational services	• Stroke vocational rehabilitation should be an integral part of the whole rehabilitation pathway, promoting awareness of the impact of meaningful work for health and wellbeing regardless of age. • This should be offered in a tiered model, based on complexity of need, as follows: - Level 3: All patients should be offered appropriate advice, signposting, and referral for more support. - Level 2: Stroke survivors who were working prior to their stroke should be offered a return to work plan. - Level 1: Stroke survivors with more complex needs preventing them from returning to work within six months should be offered specialist vocational rehabilitation.	

17. Langhorne P, Baylan S; Early Supported Discharge Trialists. Early supported discharge services for people with acute stroke. Cochrane Database Syst Rev. 2017 Jul 13;7(7):CD000443. doi: 10.1002/14651858.CD000443.pub4. PMID: 28703869; PMCID: PMC6483472.

18. RCP National Clinical Guideline for Stroke. Fifth Edition 2016 https://www.rcplondon.ac.uk/guidelines-policy/stroke-guidelines

19. NICE Stroke Rehabilitation in adults 2013 [CG162] https://www.nice.org.uk/guidance/cg162

Continue next

System improvement priority: 5. Rehabilitation and life after stroke

Key areas for focus	Actions to take	Guidance and best practice
5.4 Integrated Community Stroke Services (ICSS) including Early Supported Discharge (ESD)	• ICSS should include provision of ESD and ongoing community based stroke specialist rehabilitation in a needs based, rather than time based, pathway. This should be delivered in partnership with inpatient services, other community NHS services, social services, and the voluntary sector. • Multi-disciplinary rehabilitation teams should each include a wide range of expertise including consultant stroke physicians, nurses, physiotherapists, occupational therapists, speech and language therapists, clinical psychologists, rehabilitation assistants, social workers with expertise in stroke rehabilitation, with access to life after stroke services. • ESD must be in place to enable stroke survivors with mild to moderate disability to continue their rehabilitation therapy at home, with the same intensity and expertise that they would receive in hospital. • The ICSS, in partnership with other agencies, will develop appropriate service pathways around ESD based on patient need and following holistic assessment with the patient and those close to them.	
5.5 ICSS pathways	• **Pathway 1: Home with ICSS input** - Contact with patient/carer for support within 24 hours. - Patients eligible for ESD to be assessed and offered treatment within 24 hours. - All other patients assessed within 72 hours with treatment commencing no later than seven days or earlier if based on clinical judgement and patient choice. - Intervention provided by ICSS for up to six months, with extensions for patients based on clinical reasoning and the option of re-referral back into the service at the end of this period. • **Pathway 2: Home with ICSS combined with daily social care support** - A joint rehabilitation management plan with social care should be put in place following the initial assessment at home within 24 hours of discharge. - Social care support of up to four times a day for six weeks (e.g. reablement service) combined with ICSS, to enable safe management and rehabilitation at home. - ICSS support staff in social care services to carry out the practice of the rehabilitation treatment plans.	

System improvement priority: 5. Rehabilitation and life after stroke

Key areas for focus	Actions to take	Guidance and best practice
	• **Pathway 3: Discharged to residential or nursing home.** - Assessment within 72 hours of hospital discharge based on clinical reasoning and patient need. - Treatment for those patients who require therapy no later than seven days. - Care home staff should have training on the physical, psychological and social effects of stroke and optimum management of common impairments.	
5.6 Intensity and responsiveness	• ICSS should ensure all eligible stroke patients, regardless of their disability or destination, have access to rehabilitation delivered by a multi-disciplinary team with stroke specialist skills. • Specialist rehabilitation should be offered for the first six months following hospital discharge, with re-referral available where appropriate. • ICSS should be available seven days a week. • Each relevant therapy should be offered for at least 45 minutes for a minimum of five days a week, dependent on need [NICE QS2]. • Stroke patients assessed as suitable for ESD should be offered assessment and treatment in the community within 24 hours. All other patients should be assessed within 72 hours and begin treatment within seven days of assessment. • Standardised outcome measures and patient experience measures should be used to monitor performance and measure impact.	
5.7 Follow-up reviews	• All stroke patients should receive a six-month post-stroke review. This may be face to face, or virtual, depending upon the stroke survivors preference and clinical needs. • Patients should receive annual reviews to identify unmet needs. • Referral, including self-referral, back to ICSS should be available.	

System improvement priority: 5. Rehabilitation and life after stroke

Key areas for focus	Actions to take	Guidance and best practice
5.8 Life After Stroke (LaS) services	• LaS services [full Life After Stroke service guidance will be linked here once published] should be made available and accessible to all stroke patients from the acute hospital phase onwards. The mode and intensity of LaS key worker support should be personalised to their needs. • Patients, carers, and family members should receive information and, if applicable, training on the nature, implications, and management of problems due to stroke. • LaS services should integrate with rehabilitation services to ensure optimal multi-disciplinary coordination of an individual's care and support. • Stroke survivors should have access to stroke specific communication support, peer support, carer support, and health and wellbeing support. Access to other non-stroke specific community support should be sourced if these will help them achieve their goals.	
5.9 Performance monitoring	• All teams delivering stroke rehabilitation care should input into the clinical SSNAP and SSNAP Post Acute Organisational Audit. • Relevant data from the six-month review should be recorded as part of SSNAP. • There should be active performance monitoring across all areas of rehabilitation provision, ensuring they are at least in line with NICE (updated guidelines due Oct 2023), RCP National Clinical Guidelines (updated guidelines due March 2023), and SSNAP standards.	

System improvement priority: 6. Workforce

Workforce planning should account for the skills and competencies required to provide stroke-related services, aligned to patient need, as detailed in the Stroke Specific Education Framework (SSEF)[20]. A holistic approach to workforce development is recommended; incorporating commissioning of both stroke-specific, and professional practice education and training opportunities. Workforce planning activities should encompass all staff involved in the delivery of effective, safe and compassionate stroke care, including those from health and social care to the voluntary sector.

A local skills analysis should be conducted to assess the existing workforce currently available to providers. It may be that an innovative skill-mix within the local workforce supports variation of the workforce model outlined.

Supporting all NHS staff working in stroke care should be underpinned by the People Plan[21], fostering a culture of inclusion and belonging as well as action to grow our workforce, train our people, and work together to deliver patient care.

Key areas for focus	Actions to take	Guidance and best practice
6.1 Local skills analysis	• A local skills analysis should be conducted to assess the competences of the existing workforce currently available to providers, utilising the SSEF. • Workforce planning should reflect the competences required to provide services which reflect patient need locally and determine the nature of the clinical professional required to undertake the role. • Workforce planning and transformation tools, such as Health Education England's (HEE's) STAR tool and the SSEF should underpin all activities. • All commissioned services should submit organisational audit data, capturing workforce snapshots, to SSNAP.	

20. SSEF. https://stroke-education.org.uk/

21. People Plan 2020/21 - action for us all https://www.england.nhs.uk/ournhspeopl

Continue next

System improvement priority: 6. Workforce

Key areas for focus	Actions to take	Guidance and best practice
6.2 Stroke relevant workforce competence	• Commissioners should require that all those caring for people with stroke have the competences and attitudes to provide effective, safe and compassionate care for the vulnerable, with restricted mobility, motor and sensory loss, and impaired communication, cognition and neuropsychological problems. • Competence requirements for various roles involved in stroke care delivery can be accessed via the SSEF. • Skills in the management of high-risk conditions for stroke (primarily AF, high blood pressure and cholesterol) should be promoted for all staff in stroke related care. • Competence in relation to early recognition and access to associated referral pathways should be promoted for all staff involved in stroke related care. • Skills in the recognition, communication of, and access to referral pathways in end-of-life care should be promoted for all staff members. • HEE stroke training resources should be promoted to all staff to support cross/up-skilling, training, and development.	
6.3 Forward planning	• The actions in the People Plan should be addressed across the workforce to ensure all staff are supported, now and in the future. • Commissioners need to work with HEE to develop cross-speciality and cross-profession competence, to promote flexible working across the stroke care pathway. • Commissioners should consider embedding new and emerging roles based on locally driven pressures such as attrition. • Service transformation should be supported using the Leadership Academy development offer to embed leadership from bottom up. • Opportunities for shared or co-located staffing across teams should be considered. • Embed workforce education and training in all service models to allow continuous professional development, maintain clinical capability and allow opportunities for career and role advancement.	

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System improvement priority: 7. Medicines optimisation

The aim of medicines optimisation is to help improve patient outcomes by ensuring that medicines are prescribed and taken correctly, thus avoiding the intake of unnecessary medicines, reducing wastage of medicines, and improving medicines safety. It is about ensuring that the right patients get the right choice of medicine at the right time and encouraging patients to take ownership of their treatment.

The NICE guideline 'Medicines optimisation: the safe and effective use of medicines to enable the best possible outcomes'[22] and related Quality Standard[23] provide guidance on safe and effective use of medicines in health and social care for people taking one or more medicines.

Key areas for focus	Actions to take	Guidance and best practice
7.1 Patient and carer education self-management strategy	• Support patients to understand the benefits of shared decision making by highlighting evidence showing better outcomes for patients who are involved in decisions about their condition and their treatment. • Prescribing pharmacists could provide support regarding management of medications. • Use Patient Activation Measure (PAM) to identify level of health literacy to further enable self-management. Utilising the language translations of PAM where language restrictions are identified. • Signpost patients to resources on stroke medication e.g. My Stroke Guide online resource from the Stroke Association.	
7.2 Medication review	• Structured medication reviews to be undertaken by clinical pharmacists located within GP practices, in line with the Community Pharmacy Contractual Framework for 2019 to 2024: supporting delivery for the NHS Long Term Plan. • Ensure changes to medication (e.g. shift from brand to generic) are clinically appropriate. • Undertake shared decision making with the patient when it comes to changing medication to ensure that all new dosing regimes, potential side effects and drug-to-drug interactions are discussed and fully understood.	
7.3 Communication of medication across the pathway	• Ensure a list of current medications are accessible to acute stroke services within 24 hours of patients being admitted to hospital with an acute stroke. • When stroke patients are discharged from hospital into the community their GP should receive, within one week, a list of the medication prescribed to take at home.	

22. NICE Medicines optimisation: the safe and effective use of medicines to enable the best possible outcomes [NG5] https://www.nice.org.uk/guidance/ng5

23. Stroke in adults [QS2] https://www.nice.org.uk/Guidance/QS2

System improvement priority: 8. Technology

Technology is increasingly being used to help health and care professionals communicate better and enable people to access the care they need quickly and easily, and at a time that suits them.

The NHS Long Term Plan underpins the importance of technology in the NHS, setting out the critical priorities to support digital transformation and providing a step change in the way the NHS cares for citizens.

The importance of technology is embedded throughout the ISDN optimal stroke care pathway specification. Telemedicine and AI decision support tools play a particularly prominent role during the initial response and hyper acute care phases, where communication between organisations and timely availability of imaging services are vital to support the timely diagnosis, treatment, and care of stroke patients.

Key areas for focus	Actions to take	Guidance and best practice
8.1 Evolving with new technologies	• The use of AI decision support tools in stroke care should be encouraged and deployed in line with its certified and pre-specified use, or within a research environment. • The technological skills of the healthcare workforce should be regularly assessed and developed, as appropriate, to ensure the workforce skill mix can continue to support technological developments. • Technology and pricing should be considered within short and medium-term service development and making use of the national stroke AI procurement framework.	
8.2 Imaging	• Technology should be in place to enable optimal image sharing between centres within and external to each ISDN, such as the implementation of Stroke AI solutions to support timely decision making. • Imaging technology should be available 24 hours per day, seven days per week. • Imaging decision making should be supported by AI to access off-site expertise where appropriate.	
8.3 Communication between providers	• Pathways must be put in place to enable pre-hospital clinicians to locate the most appropriate and closest CSC or ASC, supported via technology such as ‘Apps’ or telemedicine where appropriate. • Telemedicine may enable pre-hospital clinicians to establish a differential diagnosis with senior stroke clinicians, offering more specialist triage and either avoiding or better specifying onward conveyance. • Information systems supported by telehealth should be used to aid more timely transfers between providers.	

Self-assessment questionnaire

The aim of these questions is to assist ISDNs to reflect on their current stroke service provision against the NSSM and to identify where there are opportunities to improve service provision across the pathway. These questions should be used alongside other resources to facilitate discussion and identify improvement opportunities or exemplars of good practice. The self-assessment questions have been developed in partnership with our stakeholders.

Specifically these questions are designed to:

- Assess the existing system provision of services and quality care for people who are at risk, or who have experienced a stroke, along the pathway.
- Identify any current gaps in service provision and/or current opportunities to enhance or develop services/systems at a local level.
- Consider future demand, using local intelligence alongside projected data to ensure accuracy and consistency.
- Help assess the progress of any system improvements over time.

For each question, please select the response (using the interactive buttons) which best describe your current stroke service provision. Response options are: 1 = Not met, 2 = Process started, 3 = Halfway there, 4 = Nearly there, 5 = Fully met, N/A = Not applicable. A page for notes and comments is included at the end.

If you wish to complete and save this questionnaire please enter your organisation name and date of completion below.

Name of organisation: _____ **Date of completion:**_____ **Completed by:** _____

Integrated care question

	1. Not met	2. Process started	3. Partially met	4. Largely met	5. Fully met	N/A
Do you know your responsible officer(s) for stroke within your Integrated Care Systems (ICS) and do you hold regular meetings with them with a shared vision?	☐	☐	☐	☐	☐	☐

Continue next

Self-assessment questionnaire

System improvement priorities	Self assessment questions	1. Not met	2. Process started	3. Partially met	4. Largely met	5. Fully met	N/A
0. Health inequalities	0.1.1 Have you linked with your locally appointed ICS designated health inequalities lead(s) and other relevant health inequality stakeholders to ensure a collaborative approach to implementing interventions to reduce health inequalities?	☐	☐	☐	☐	☐	☐
	0.2.1 Do you have proposed improvement methodologies identified to reduce health inequalities, with clear milestones and outcomes?	☐	☐	☐	☐	☐	☐
	0.2.2 Have you considered the patient voice in the development of your interventions?	☐	☐	☐	☐	☐	☐
	0.3.1 Do you have a plan in place to ensure timely disaggregate data to monitor health inequality – particularly in relation to access, experience, and outcomes – is available for all components of your stroke pathway?	☐	☐	☐	☐	☐	☐
1. Prevention	1.1.1 Is there a strategy in place to help identify people who are at risk of stroke?	☐	☐	☐	☐	☐	☐
	1.1.2 Does your risk identification strategy include holding up-to-date registers of people who have had a stroke or TIA?	☐	☐	☐	☐	☐	☐
	1.1.3 Is there support and educational opportunities in place to enable the public to assess their own risk?	☐	☐	☐	☐	☐	☐
	1.1.4 Do you intend to fully participate in the Cardiovascular Disease Prevention Audit (CVDPREVENT) and use the findings to support the identification of at risk patients?	☐	☐	☐	☐	☐	☐
	1.2.1 Do you have a strategy in place to encourage people to reduce their risk of stroke?	☐	☐	☐	☐	☐	☐
	1.2.2 Does your risk reduction strategy include primary care services providing advice and support regarding lifestyle modifications and personalised care in the home (NHS@home) to their high risk patients?	☐	☐	☐	☐	☐	☐
	1.2.3 Does your risk reduction strategy include primary care services ensuring the prescribing, management, and recording of risk reducing medications are in line with current guidelines?	☐	☐	☐	☐	☐	☐
	1.3.1 Is there a protocol to aid stroke and TIA diagnosis, including inpatient and outpatient diagnostic facilities and access to regional cryptogenic stroke meetings?	☐	☐	☐	☐	☐	☐
	1.3.2 Is there a strategy to ensure primary and secondary care services are supporting patients who have had a stroke or TIA to minimise their risk of future strokes (i.e. support with adherence to medications, BP@home self-monitoring or lifestyle modification pathways)?	☐	☐	☐	☐	☐	☐

Self-assessment questionnaire

System improvement priorities	Self assessment questions	1. Not met	2. Process started	3. Partially met	4. Largely met	5. Fully met	N/A
2. TIA management	2.1.1 Is there a protocol in place to ensure your TIA services meet national targets for assessing and treating patients who have experienced a TIA, based on symptom severity and time between symptom onset and health services presentation?	☐	☐	☐	☐	☐	☐
	2.1.2 Are you confident that triaging patients according to risk stratification tools has been discontinued and do you have evidence to support this?	☐	☐	☐	☐	☐	☐
	2.1.3 Do you have processes in place to ensure that patients are receiving appropriate imaging on the same day as their initial assessment?	☐	☐	☐	☐	☐	☐
	2.1.4 Is MRI the preferred imaging modality for all suspected TIA patients as part of an ambulatory TIA pathway, as per NICE 128 guidance?	☐	☐	☐	☐	☐	☐
	2.1.5 Are your TIA services assessing all patients with TIA for carotid stenosis and paroxysmal atrial fibrillation ?	☐	☐	☐	☐	☐	☐
3. Pre-hospital	3.1.1 Do your emergency services commission training for all emergency personnel (e.g. call handlers) so they can recognise stroke symptoms and adopt appropriate action if stroke symptoms are identified?	☐	☐	☐	☐	☐	☐
	3.2.1 Are you working with regional and national ambulance teams to ensure they have action plans in place to reduce response, on-scene, and transfer times for suspected stroke patients?	☐	☐	☐	☐	☐	☐
	3.2.2 Do you regularly review your SSNAP response time data to monitor trends and progress towards reducing response times?	☐	☐	☐	☐	☐	☐
	3.3.1 Is your regional ambulance service assessing and managing suspected stroke patients based on best clinical practice?	☐	☐	☐	☐	☐	☐
	3.3.2 Does your regional ambulance service discuss possible stroke patients with a hospital-based stroke expert before deciding where the patient should be conveyed?	☐	☐	☐	☐	☐	☐
	3.4.1 Are your regional ambulance service(s) immediately transferring patients with suspected stroke to an appropriate acute or comprehensive stroke centre, underpinned by agreed pathways and supported by technology?	☐	☐	☐	☐	☐	☐

Self-assessment questionnaire

System improvement priorities	Self assessment questions	1. Not met	2. Process started	3. Partially met	4. Largely met	5. Fully met	N/A
4. Hyper acute and acute care	4.1.1 Do your acute stroke services provide acute and hyper acute stroke care 24 hours per day, seven days per week?	☐	☐	☐	☐	☐	☐
	4.1.2 Do your acute stroke services provide access to multidisciplinary teams seven days a week?	☐	☐	☐	☐	☐	☐
	4.1.3 Are protocols in place to ensure stroke patients are monitored appropriately, e.g. by trained stroke staff, within the acute setting?	☐	☐	☐	☐	☐	☐
	4.1.4 Are your acute stroke services providing accurate SSNAP clinical audit information, as per requirements?	☐	☐	☐	☐	☐	☐
	4.2.1 Is there a strategy in place to ensure all patients who present at hospital with a suspected stroke are admitted directly to an acute or comprehensive stroke centre?	☐	☐	☐	☐	☐	☐
	4.2.2 Are these patients immediately assessed by appropriately trained staff to determine diagnostics needed and intervention suitability?	☐	☐	☐	☐	☐	☐
	4.3.1 Do you have assurance that all newly diagnosed stroke patients are assessed by a stroke specialist clinician, face to face or remotely, within 60 minutes of arriving at hospital, and seen face to face within 14 hours?	☐	☐	☐	☐	☐	☐
	4.3.2 Is there an emergency protocol in place to ensure that diagnosed stroke patients are treated as the highest medical priority?	☐	☐	☐	☐	☐	☐
	4.3.3 Are newly confirmed acute stroke patients admitted to highly specialised stroke units within four hours of arriving at hospital?	☐	☐	☐	☐	☐	☐
	4.3.4 Are acute stroke patients spending at least 90% of their hospital stay in a stroke unit?	☐	☐	☐	☐	☐	☐
	4.4.1 Have you undertaken a gap analysis regarding access to acute stroke imaging, in line with the National Optimal Stroke Imaging Pathway (NOSIP)?	☐	☐	☐	☐	☐	☐
	4.4.2 Is there a networked plan in place regarding progression to delivery of the NOSIP?	☐	☐	☐	☐	☐	☐
	4.4.3 Do you routinely undertake CT & CTA (aligned with the NOSIP) for appropriate patients at the same sitting 24/7?	☐	☐	☐	☐	☐	☐
	4.4.4 Do you routinely undertake CT, CTA & CTP (aligned with the NOSIP) for appropriate patients at the same sitting 24/7?	☐	☐	☐	☐	☐	☐

Self-assessment questionnaire

System improvement priorities	Self assessment questions	1. Not met	2. Process started	3. Partially met	4. Largely met	5. Fully met	N/A
4. Hyper acute and acute care	4.4.5 Do your stroke physicians routinely (for majority of patients) use Artificial intelligence decision support software (AI) to interpret plain CT brain scans?	☐	☐	☐	☐	☐	☐
	4.4.6 Do your stroke physicians routinely (for majority of patients) use Artificial intelligence decision support software (AI) to interpret CTA brain scans?	☐	☐	☐	☐	☐	☐
	4.4.7 Do your stroke physicians routinely (for majority of patients) use Artificial intelligence decision support software (AI) to interpret CTP brain scans?	☐	☐	☐	☐	☐	☐
	4.4.8 Do you routinely undertake first line MRI (aligned with the NOSIP) for appropriate patients 9-5pm: Mon-Friday?	☐	☐	☐	☐	☐	☐
	4.4.9 Do you routinely undertake first line MRI (aligned with the NOSIP) for appropriate patients for extended hours (at least 10hrs / day): Mon-Friday?	☐	☐	☐	☐	☐	☐
	4.4.10 Do you routinely undertake first line MRI (aligned with the NOSIP) for appropriate patients Saturday and Sundays?	☐	☐	☐	☐	☐	☐
	4.5.1 Are all stroke patients seen by a stroke specialist clinician daily during the first 72 hours of admission to the hyper-acute stroke service, following initial assessments?	☐	☐	☐	☐	☐	☐
	4.6.1 Is there an intracerebral haemorrhage protocol in place to ensure patients are identified and given appropriate treatment within the first hour of reaching hospital, with appropriate referral to neurosurgical centres where required?	☐	☐	☐	☐	☐	☐
	4.7.1 Is there a thrombolysis protocol in place to ensure suitable patients are identified and receive thrombolysis onsite within 60 minutes of admission, and ideally within 20 minutes, regardless of day or time of admission?	☐	☐	☐	☐	☐	☐
	4.8.1 Is there a thrombectomy protocol in place, with milestones that are monitored, to ensure suitable patients are identified and are able to receive thrombectomy as soon as possible?	☐	☐	☐	☐	☐	☐
	4.9.1 Do your acute stroke services have protocols in place to ensure patients requiring vascular or neurosurgical services are able to receive the appropriate treatment, including carotid endartectomy within 48 hours of diagnosis, with appropriate referral where required?	☐	☐	☐	☐	☐	☐
	4.10.1 Do your acute stroke services have protocols in place to reduce the risk, and manage the common complications, of stroke, including urinary sepsis and pneumonia, venous thromboembolism (VTE), and falls?	☐	☐	☐	☐	☐	☐

Self-assessment questionnaire

System improvement priorities	Self assessment questions	1. Not met	2. Process started	3. Partially met	4. Largely met	5. Fully met	N/A
4. Hyper acute and acute care	4.10.2 Are designated antimicrobial stewardship leads available within your acute services?	☐	☐	☐	☐	☐	☐
	4.10.3 Are your acute services ensuring patients who require only minimal support to mobilise are offered early mobilisations within 24 hours?	☐	☐	☐	☐	☐	☐
	4.11.1 Do your acute stroke services have protocols in place for the promotion of bladder and bowel continence, which includes prohibiting unnecessary catheter use and the prevention of pressure sores?	☐	☐	☐	☐	☐	☐
	4.12.1 Do your acute services have dysphasia assessment and nutritional management protocols in place, which includes swallowing screening assessment and nutritional intervention and monitoring, guided by a specialist therapist?	☐	☐	☐	☐	☐	☐
	4.12.2 Are your acute stroke patients receiving a swallow screening test within four hours of arrival and, for those with prolonged dysphagia, a formal swallow assessment within 72 hours?	☐	☐	☐	☐	☐	☐
	4.13.1 Do your acute stroke services ensure stroke patients who require end of life care have an advanced care plan in place, including access to specialist services, in line with the Gold Standards Framework for end of life Care?	☐	☐	☐	☐	☐	☐
	4.14.1 Do your inpatient services have protocols in place for the safe discharge of stroke patients?	☐	☐	☐	☐	☐	☐
	4.14.2 Is a personalised discharge care plan - including onward NHS services and social care, equipment needed in situ, and discharge dates - agreed and confirmed with the stroke survivor and their family before discharge?	☐	☐	☐	☐	☐	☐
	4.14.3 Are patients provided with a personal stroke record in hospital with personalised information about their stroke and the care they receive?	☐	☐	☐	☐	☐	☐
5. Rehabilitation and life after stroke	5.1.1 Is there a strategy in place to enable stroke patients to access inpatient rehabilitation as soon as clinically appropriate and throughout their hospital stay?	☐	☐	☐	☐	☐	☐
	5.1.2 Do all stroke patients have equal access to inpatient rehabilitation to meet their needs, irrespective of their level of disability or discharge destination?	☐	☐	☐	☐	☐	☐
	5.2.1 Are resources in place to consider and support the psychological needs of stroke patients throughout their stroke care pathway?	☐	☐	☐	☐	☐	☐

Self-assessment questionnaire

System improvement priorities	Self assessment questions	1. Not met	2. Process started	3. Partially met	4. Largely met	5. Fully met	N/A
5. Rehabilitation and life after stroke	5.3.1 Is vocational rehabilitation, based on level of need, available across the whole rehabilitation pathway?	☐	☐	☐	☐	☐	☐
	5.4.1 Do you have an Integrated Community Stroke Service (ICSS)?	☐	☐	☐	☐	☐	☐
	5.4.2 Is your ICSS able to support the needs of stroke patients in the community, including providing Early Supported Discharge ((ESD), through a multidisciplinary team approach?	☐	☐	☐	☐	☐	☐
	5.4.3 Does your ICSS work in partnership with other NHS and social services and the voluntary sector to meet the needs of all stroke survivors?	☐	☐	☐	☐	☐	☐
	5.6.1 On transfer of care from hospital, do all stroke patients have equal access to rehabilitation provided by the ICSS, irrespective of their level of disability or discharge destination?	☐	☐	☐	☐	☐	☐
	5.6.2 Are stroke survivors assessed by the ICSS and treatment started in a timely manner?	☐	☐	☐	☐	☐	☐
	5.6.3 Is the ICSS available seven days per week?	☐	☐	☐	☐	☐	☐
	5.6.4 Can the ICSS offer specialist stroke rehabilitation daily, for a minimum of 45 minutes, if deemed clinically appropriate?	☐	☐	☐	☐	☐	☐
	5.6.5 Is the ICSS offered for up to six months, with an option for patients to be re-referred back in at any time if they have defined rehabilitation needs and goals?	☐	☐	☐	☐	☐	☐
	5.7.1 Are the needs of stroke survivors reviewed six months post stroke and yearly after that?	☐	☐	☐	☐	☐	☐
	5.8.1 Are LaS services (including emotional support, communication support, personalised information provision, peer support and secondary prevention support) available to all stroke survivors and personalised to their needs?	☐	☐	☐	☐	☐	☐
	5.8.2 Are carer support services available for stroke survivors?	☐	☐	☐	☐	☐	☐
	5.9.1 Does the ICSS ensure they submit SSNAP rehabilitation audit information as per requirements?	☐	☐	☐	☐	☐	☐
	5.9.2 Does the ICSS have processes in place to monitor the effectiveness and outcomes of interventions provided?	☐	☐	☐	☐	☐	☐

Self-assessment questionnaire

System improvement priorities	Self assessment questions	1. Not met	2. Process started	3. Partially met	4. Largely met	5. Fully met	N/A
6. Workforce	6.1.1 Are audits regularly undertaken to ensure local workforce competencies meet patient need and SSNAP organisational information is submitted, as per requirements?	☐	☐	☐	☐	☐	☐
	6.2.1 Is training, support, and monitoring in place to ensure all clinical staff who work directly with stroke patients can provide effective, safe, and compassionate care?	☐	☐	☐	☐	☐	☐
	6.2.2 Do all stroke patients have access to clinical staff who are competent in identifying and accessing appropriate referral pathways and end-of-life care?	☐	☐	☐	☐	☐	☐
	6.3.1 Are you aware of the NHS People Plan 2020/21 and the actions needed to ensure all NHS staff work in a compassionate and inclusive culture?	☐	☐	☐	☐	☐	☐
	6.3.2 Are you encouraging and supporting staff to undertake continuous professional development to maintain clinical capability and allow opportunities for career and role advancement?	☐	☐	☐	☐	☐	☐
	6.3.3 Is there a strategy in place to ensure your workforce meets future need? This may include considering service transformation, across organisation working, and cross-specialty competences.	☐	☐	☐	☐	☐	☐
7. Medicines optimisation	7.1.1 Is shared decision making routinely used when discussing treatment and medication options with stroke patients?	☐	☐	☐	☐	☐	☐
	7.2.1 Are your primary care services undertaking regular medication reviews?	☐	☐	☐	☐	☐	☐
	7.2.2 Does this include assessing the clinical appropriateness of any changes made to patient medications before the changes are made, e.g. branded to generic switching?	☐	☐	☐	☐	☐	☐
	7.3.1 Is there a strategy in place to ensure that the medication regimes of stroke patients, including any changes, are appropriately communicated between primary and secondary care services in a timely manner to ensure continuity of care?	☐	☐	☐	☐	☐	☐
8. Technology	8.1.1 Are you encouraging and enabling the use of technology that best meets current and future requirements, including but not limited to artificial inteligence (AI), as part of your service planning?	☐	☐	☐	☐	☐	☐
	8.2.1 Are procedures and technologies in place to enable immediate image sharing between emergency and acute services 24 hours per day, seven days per week, aligned to the NOSIP?	☐	☐	☐	☐	☐	☐
	8.3.2 Are technologies in place to facilitate admission to, and transfers from, emergency and acute services?	☐	☐	☐	☐	☐	☐

Self-assessment questionnaire

Please use the box below to add any notes or comments. A scroll bar will activate if your text overruns the box.

References

This guide works within the following legislative and policy frameworks

- ISDN National Stroke Service Model May 2021
- NHS Long Term Plan 2019
- NICE quality standard [QS2]. Stroke in adults 2016
- NICE guideline [NG128] Stroke and transient ischaemic attack in over 16s: diagnosis and initial management 2019
- NICE clinical guideline [CG162] Stroke rehabilitation in adults 2013
- NICE clinical guideline [CG181] Cardiovascular disease: risk assessment and reduction, including lipid modification 2016
- NICE guideline [NG5] Medicines optimisation: the safe and effective use of medicines to enable the best possible outcomes 2015
- NICE quality standard [QS120] Medicines optimisation 2016
- NICE quality standard [QS100] Cardiovascular risk assessment and lipid modification
- NHS Seven Day Services Clinical Standards. September 2017
- RCP National Clinical Guideline for Stroke. Fifth Edition 2016
- NHS England Stroke Services: Configuration Decision Support Guide 2018
- NHS England New ambulance service standards 2017
- GIRFT Programme National Specialty Report for Stroke

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- Stroke Association State of the Nation – Stroke Statistics 2018 https://www.readkong.com/page/state-of-the-nation-6286292
- Bo Norrving, Jon Barrick, Antoni Davalos, et al. Action Plan for Stroke in Europe 2018–2030. Eur Stroke J 2018; DOI: 10.1177/2396987318808719 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6571507/

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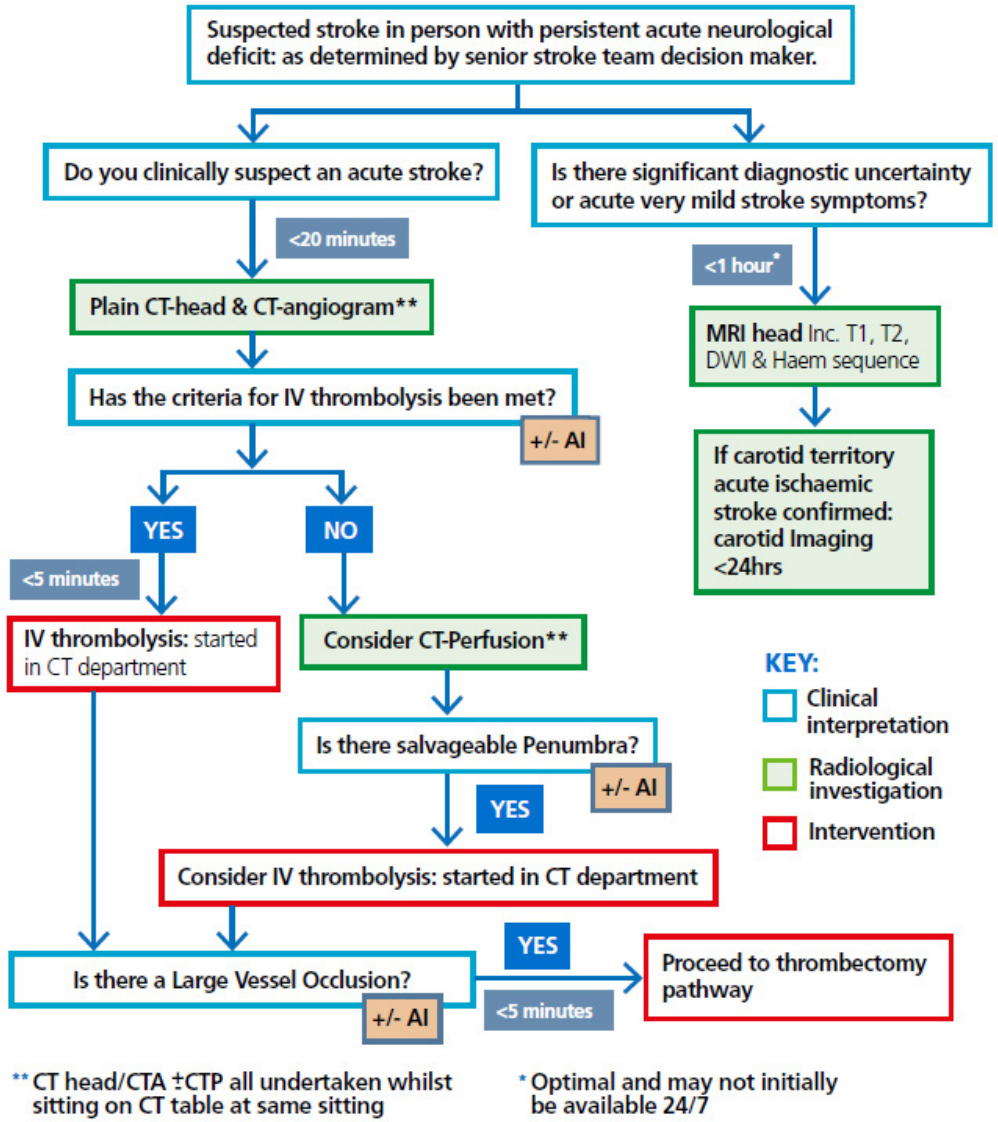
National Optimal Stroke Imaging pathway (NOSIP)

NOSIP has been developed based on the best evidence and extensive expert consensus, including the NHS National Imaging Optimisation Delivery Board, Intercollegiate Stroke Working Party and the United Kingdom Neurointervention Group

- ISDN National Stroke Service Model May 2021



0. Health inequalities

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NHS England and NHs Improvement Patient Equalities Team. Equality and Health Inequalities Network Dashboard. https://future.nhs.uk/EHIME/grouphome. (FutureNHS site NHS email address for login is required)

Public Health England. Inequality tool. Latest update March 2021 https://fingertips.phe.org.uk/profile/inequality-tools#:~:text=The%20Health%20Inequalities%20Dashboard%20provides%20information%20to%20monitor,longer%20term%20data%20provided%20where%20these%20are%20available.

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1. Prevention: 1.1 Identifying those at risk

Guidelines

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NICE guideline Stroke and transient ischaemic attack in over 16s: diagnosis and initial management [NG128] 2019; 1.1 Rapid recognition of symptoms and diagnosis. https://www.nice.org.uk/guidance/NG128

NICE guideline Cardiovascular disease: risk assessment and reduction, including lipid modification [CG181] 2014. https://www.nice.org.uk/guidance/cg181/chapter/1-Recommendations

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Public Health England. Guidance: Making Every Contact Count (MECC) https://www.gov.uk/government/publications/making-every-contact-count-mecc-practical-resources

Evidence and other resources

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1. Prevention: 1.2 Primary prevention measures

Guidelines

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1. Prevention: 1.3 Secondary prevention measures

Guidelines

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Can personalised secondary antithrombotic prevention reduce the risk of intracranial haemorrhage after ischaemic stroke or TIA?

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1. Prevention: 1.4 Immediate response to stroke symptoms

Guidelines

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2. TIA management: 2.1 Initial management of TIA

Guidelines

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Evidence and other resources

2. TIA management: 2.2 Recurrent TIA

Guidelines

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3. Pre-hospital: 3.1 Optimising 999 call response

Guidelines

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NHS England Stroke Services: Configuration Decision Support Guide 2018; 3. Key elements of a high quality stroke service. https://www.england.nhs.uk/mids-east/wp-content/uploads/sites/7/2018/03/stroke-services-configuration-decision-support-guide.pdf

R&I demand signalling research question

What is the effectiveness of diagnostic criteria and the strategy used by emergency call takers in the detection of stroke; toward the development of a unified emergency call pathway for emergency workers, and non-acute health services?

Evidence and other resources

Siarkowski M et al. Meta-analysis of interventions to reduce door to needle times in acute ischaemic stroke patients. BMJ Open Qual. 2020; 9(3):e000915. https://bmjopenquality.bmj.com/content/9/3/e000915

Zhelev Z et al. Prehospital stroke scales as screening tools for early identification of stroke and transient ischemic attack. Cochrane Database of Systematic Reviews. 2019. https://pubmed.ncbi.nlm.nih.gov/30964558/#affiliation-1

3. Pre-hospital: 3.2 Assessments required en-route

Guidelines

NICE guideline Stroke and transient ischaemic attack in over 16s: diagnosis and initial management [NG128] 2019: 1.1 Rapid recognition of symptoms and diagnosis. https://www.nice.org.uk/guidance/NG128

RCP National Clinical Guidelines for stroke 5th edition 2016: 2.2 Overall organisation of acute stroke services; 2.3 Specialist stroke services; 3.1 Pre-hospital care. https://www.strokeaudit.org/SupportFiles/Documents/Guidelines/2016-National-Clinical-Guideline-for-Stroke-5t-(1).aspx

Evidence and other resources

Zhelev Z et al. Prehospital stroke scales as screening tools for early identification of stroke and transient ischemic attack. Cochrane Database of Systematic Reviews. 2019; Issue 4. https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD011427.pub2/full

Sheppard JP, Mellor RM, Greenfield S on behalf of the CLAHRC BBC investigators, et al The association between prehospital care and in-hospital treatment decisions in acute stroke: a cohort study Emergency Medicine Journal. 2015; 32:93-99. https://emj.bmj.com/content/32/2/93

R&I demand signalling research question

Can accurate pre-hospital triage of suspected stroke be achieved using a simple symptom checklist and point of care biomarkers?

3. Pre-hospital: 3.3 Transfer to an acute or comprehensive stroke centre

Guidelines

NICE guideline Stroke and transient ischaemic attack in over 16s: diagnosis and initial management [NG128] 2019: 1.1 Rapid recognition of symptoms and diagnosis. https://www.nice.org.uk/guidance/NG128

NICE Quality standard Stroke in adults [QS2] 2010: Quality statement 1: Prompt admission to specialist acute stroke units. https://www.nice.org.uk/guidance/qs2

RCP National Clinical Guidelines for stroke 5th edition 2016: 2.2 Overall organisation of acute stroke services; 3.1 Pre-hospital care; 3.10 Acute stroke care. https://www.strokeaudit.org/SupportFiles/Documents/Guidelines/2016-National-Clinical-Guideline-for-Stroke-5t-(1).aspx

Evidence and other resources

McClelland G et al. Positive predictive value of stroke identification by ambulance clinicians in North East England: a service evaluation. Emergency Medicine Journal. 2020. https://emj.bmj.com/content/37/8/474

Langhorne P, Ramachandra S. Organised inpatient (stroke unit) care for stroke: network meta analysis. Cochrane Database of Systematic Reviews. 2020; Issue 4. https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD000197.pub4/full

Fassbender K et al. Prehospital stroke management in the thrombectomy era. Lancet Neurol. 2020; 19(7):601-610. https://www.thelancet.com/journals/laneur/article/PIIS1474-4422(20)30102-2/fulltext

McTaggart RA et al. Door-in-Door-Out Time at Primary Stroke Centers May Predict Outcome for Emergent Large Vessel Occlusion Patients Stroke. 2018; 49(12):2969-2974. https://www.ahajournals.org/doi/10.1161/STROKEAHA.118.021936

4. Hyper acute and acute care: 4.1 Requirements of the service

Guidelines

NICE guideline Stroke and transient ischaemic attack in over 16s: diagnosis and initial management [NG128] 2019: 1.1 Rapid recognition of symptoms and diagnosis; 1.3 Specialist care for people with acute stroke. https://www.nice.org.uk/guidance/NG128

NHS England Stroke Services: Configuration Decision Support Guide 2018; 3. Key elements of a high quality stroke service; 4. Workforce. . https://www.england.nhs.uk/mids-east/wp-content/uploads/sites/7/2018/03/stroke-services-configuration-decision-support-guide.pdf

NHS Seven Day Services Clinical Standards 2017; 5. Diagnostics; 6. Intervention/ key services; 8. Ongoing review. https://www.england.nhs.uk/wp-content/uploads/2017/09/seven-day-service-clinical-standards-september-2017.pdf

RCP National Clinical Guidelines for stroke 5th edition 2016: 2.3 Specialist stroke services; 2.4 Resources. https://www.strokeaudit.org/SupportFiles/Documents/Guidelines/2016-National-Clinical-Guideline-for-Stroke-5t-(1).aspx

British Association of Stroke Physicians (BASP). Meeting the Future Consultant Workforce Challenges: Stroke Medicine. Stroke Medicine Consultant Workforce Requirements 2019 – 2022. 2019. https://www.basp.org/wp-content/uploads/2019/07/BASP-Stroke-Medicine-Workforce-Requirements-Report-FINAL.pdf

Evidence and other resources

Langhorne P, Ramachandra S. Organised inpatient (stroke unit) care for stroke: network meta-analysis. Cochrane Database of Systematic Reviews. 2020; Issue 4. https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD000197.pub4/full

NICE Shared learning Stroke care pathway from the emergency department to CT and the improvement of patient time from CT scan to thrombolysis. 2018. https://www.nice.org.uk/sharedlearning/stroke-care-pathway-from-the-emergency-department-to-ct-and-the-improvement-of-patient-time-from-ct-scan-to-thrombolysis

HEE Star tool user guide. https://www.hee.nhs.uk/our-work/hee-star

Morris S et al. Impact and sustainability of centralising acute stroke services in English metropolitan areas: retrospective analysis of hospital episode statistics and stroke national audit data. BMJ. 2019; 364 :l1 https://www.bmj.com/content/364/bmj.l1.full

4. Hyper acute and acute care: 4.2 Management pre-diagnosis

Guidelines

NICE guideline Stroke and transient ischaemic attack in over 16s: diagnosis and initial management [NG128] 2019: 1.3 Specialist care for people with acute stroke. https://www.nice.org.uk/guidance/NG128

RCP National Clinical Guidelines for stroke 5th edition 2016: 2.2 Overall organisation of acute stroke services; 2.3 Specialist stroke services; 3.4 Diagnosis of acute stroke; 3.7 Management of subarachnoid haemorrhage; 3.8 Cervical artery dissection; 3.9 Cerebral venous thrombosis; 3.10 Acute stroke care; 6 Commissioning of Stroke Services. https://www.strokeaudit.org/SupportFiles/Documents/Guidelines/2016-National-Clinical-Guideline-for-Stroke-5t-(1).aspx

NHS Seven Day Services Clinical Standards 2017; 2. Time to first consultant review https://www.england.nhs.uk/wp-content/uploads/2017/09/seven-day-service-clinical-standards-september-2017.pdf

R&I demand signalling research question

Are there groups of people with multiple long-term conditions for whom the risk/benefit of acute treatment is unfavourable and/or not a cost-effective use of resources?

Evidence and other resources

Allen M et al, Feasibility of a hyper-acute stroke unit model of care across England: a modelling analysis. BMJ. 2017; 7(12). https://bmjopen.bmj.com/content/bmjopen/7/12/e018143.full.pdf

4. Hyper acute and acute care: 4.3 Management at diagnosis

Guidelines

NICE Quality standard Stroke in adults [QS2] 2010: Quality statement 1: Prompt admission to specialist acute stroke units. https://www.nice.org.uk/guidance/qs2

NHS Seven Day Services Clinical Standards 2017; 3. MDT review. https://www.england.nhs.uk/wp-content/uploads/2017/09/seven-day-service-clinical-standards-september-2017.pdf

Evidence and other resources

4. Hyper acute and acute care: 4.4 Rapid access to appropriate imaging

Guidelines

NICE guideline Stroke and transient ischaemic attack in over 16s: diagnosis and initial management [NG128] 2019: 1.2 Imaging for people who have had a suspected TIA or acute non-disabling stroke. https://www.nice.org.uk/guidance/NG128

Evidence and other resources

Chalela JA et al. Magnetic resonance imaging and computed tomography in emergency assessment of patients with suspected acute stroke: a prospective comparison. Lancet. 2007; 369(9558):293-298. https://www.sciencedirect.com/science/article/abs/pii/S0140673607601512

Nagaratnam K, et al. Innovative use of artificial intelligence and digital communication in acute stroke pathway in response to COVID-19. Future Healthcare Journal. 2020;7(2):169-173. doi:10.7861/fhj.2020-0034 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7296572/

4. Hyper acute and acute care: 4.5 Assessments post diagnosis

Guidelines

RCP National Clinical Guidelines for stroke 5th edition 2016: 2.2 Overall organisation of acute stroke services; 2.3 Specialist stroke services; 3.10 Acute stroke care; 3.11 Positioning. https://www.strokeaudit.org/SupportFiles/Documents/Guidelines/2016-National-Clinical-Guideline-for-Stroke-5t-(1).aspx

NICE guideline Stroke and transient ischaemic attack in over 16s: diagnosis and initial management [NG128] 2019: 1.6 Nutrition and hydration. https://www.nice.org.uk/guidance/NG128

Evidence and other resources

Bath PM, Lee HS, Everton LF. Swallowing therapy for dysphagia in acute and subacute stroke. Cochrane Database of Systematic Reviews. 2018; Issue 10. https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD000323.pub3/full

Boaden E et al. Screening for aspiration risk associated with dysphagia in acute stroke. Cochrane Database of Systematic Reviews. 2017; Issue 6. https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD012679/full

4. Hyper acute and acute care: 4.6 Intracerebral haemorrhage

Guidelines

NICE guideline Stroke and transient ischaemic attack in over 16s: diagnosis and initial management [NG128] 2019: 1.9 Surgery for people with acute stroke. https://www.nice.org.uk/guidance/NG128

RCP National Clinical Guidelines for stroke 5th edition 2016: 2.3 Specialist stroke services; 3.6 Management of primary intracerebral haemorrhage; 3.7 Management of subarachnoid haemorrhage. https://www.strokeaudit.org/SupportFiles/Documents/Guidelines/2016-National-Clinical-Guideline-for-Stroke-5t-(1).aspx

R&I Demand Signalling research question

Which acute care interventions (or 'bundles' of care) are effective in reducing death or disability following intracerebral haemorrhage?

Evidence and other resources

Brighton and Sussex University Hospitals NHS Trust. Department of Critical care. Clinical Guideline. Guidelines for the Management of Intercerebral Haemorrhage. ICH version 2. 2020. https://www.bsuh.nhs.uk/library/wp-content/uploads/sites/8/2020/09/ICH.pdf

Parry-Jones AR et al. An Intracerebral Hemorrhage Care Bundle Is Associated with Lower Case Fatality. Ann Neurol. 2019; 86(4):495-503. https://onlinelibrary.wiley.com/doi/full/10.1002/ana.25546

McGurgan IJ et al. Acute intracerebral haemorrhage: diagnosis and management. Practical Neurology. 2021;21(2):128–136. https://pn.bmj.com/content/practneurol/21/2/128.full.pdf

Toolkits

ABC/2 Formula for Intracerebral Hemorrhage Volume https://www.mdcalc.com/abc2-formula-intracerebral-hemorrhage-volume

4. Hyper acute and acute care: 4.7 Thrombolysis management

Guidelines

NICE guideline Stroke and transient ischaemic attack in over 16s: diagnosis and initial management [NG128] 2019: 1.4 Pharmacological treatments and thrombectomy for people with acute stroke. https://www.nice.org.uk/guidance/NG128

RCP National Clinical Guidelines for stroke 5th edition 2016: 3.5 Management of ischaemic stroke; 3.13 Deep vein thrombosis and pulmonary embolism. https://www.strokeaudit.org/SupportFiles/Documents/Guidelines/2016-National-Clinical-Guideline-for-Stroke-5t-(1).aspx

NHS Seven Day Services Clinical Standards. September 2017. https://www.england.nhs.uk/wp-content/uploads/2017/09/seven-day-service-clinical-standards-september-2017.pdf

Evidence and other resources

Emberson J et al. Effect of treatment delay, age, and stroke severity on the effects of intravenous thrombolysis with alteplase for acute ischaemic stroke: a meta-analysis of individual patient data from randomised trials. Lancet. 2014; 384: 29–35. https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(14)60584-5/fulltext

NICE Shared learning East of England Stroke Telemedicine Stakeholder Partnership 2019. https://www.nice.org.uk/sharedlearning/east-of-england-stroke-telemedicine-stakeholder-partnership

Muruet W et al. Long-term survival after intravenous thrombolysis forischemic stroke: A propensity score-matched cohort with up to 10-year follow-up. Stroke. 2018; 49:607-613. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5839705/

4. Hyper acute and acute care: 4.8 Thrombectomy management

Guidelines

NICE guideline Stroke and transient ischaemic attack in over 16s: diagnosis and initial management [NG128] 2019: 1.4 Pharmacological treatments and thrombectomy for people with acute stroke.https://www.nice.org.uk/guidance/NG128

RCP National Clinical Guidelines for stroke 5th edition 2016: 3.5 Management of ischaemic stroke. https://www.strokeaudit.org/SupportFiles/Documents/Guidelines/2016-National-Clinical-Guideline-for-Stroke-5t-(1).aspx

Oxford Academic Health Science Network (August 2019) Mechanical thrombectomy for acute ischaemic stroke: an implementation guide for the UK https://www.oxfordahsn.org/our-work/adopting-innovation/mt-guide/

NHS England Clinical Commissioning Policy: Mechanical thrombectomy for acute ischaemic stroke (all ages) https://www.england.nhs.uk/wp-content/uploads/2019/05/Mechanical-thrombectomy-for-acute-ischaemic-stroke-ERRATA-29-05-19.pdf

Adult critical care transfer services (June 2021) https://www.england.nhs.uk/publication/adult-critical-care-transfer-services/

Evidence and other resources

Goyal M et al. Endovascular thrombectomy after large-vessel ischaemic stroke: a meta-analysis of individual patient data from five randomised trials. Lancet 2016; 387:723–1731. https://www.sciencedirect.com/science/article/abs/pii/S014067361600163X

Luke Morrison. Advanced prehospital stroke triage in the era of mechanical thrombectomy. Journal of Paramedic Practice. 2019; 11(4). https://doi.org/10.12968/jpar.2019.11.4.144

Wahlgren N et al. Mechanical thrombectomy in acute ischemic stroke: consensus statement by ESO-Karolinska Stroke Update 2014/2015, supported by ESO, ESMINT, ESNR and EAN. Int J Stroke. 2016; 11:134–147. https://journals.sagepub.com/doi/full/10.1177/1747493015609778

Fassbender K et al. Prehospital stroke management in the thrombectomy era. Lancet Neurol. 2020; 19(7):601-610. https://www.sciencedirect.com/science/article/abs/pii/S1474442220301022

Allen M et al. Maximising access to thrombectomy services for stroke in england: A modelling study. European Stroke Journal. 2019; 4:39-49. https://journals.sagepub.com/doi/full/10.1177/2396987318785421

Kim BM et al. Effect of Cumulative Case Volume on Procedural and Clinical Outcomes in Endovascular Thrombectomy. Stroke. 2019; 50(5):1178-1183. https://www.ahajournals.org/doi/10.1161/STROKEAHA.119.024986?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub 0pubmed

McCarthy DJ et al. Long-Term Outcomes of Mechanical Thrombectomy for Stroke: A Meta-Analysis. TheScientificWorldJournal. 2019. https://www.hindawi.com/journals/tswj/2019/7403104/

4. Hyper acute and acute care: 4.9 Vascular and neuro surgical

Guidelines

NICE guideline Stroke and transient ischaemic attack in over 16s: diagnosis and initial management [NG128] 2019: 1.2 Imaging for people who have had a suspected TIA or acute non-disabling stroke. https://www.nice.org.uk/guidance/NG128

Evidence and other resources

Azhar B et al. Timing of carotid endarterectomy and clinical outcomes. Annals of Translational Medicine. 2020; 8(19):1267. https://europepmc.org/article/MED/33178799

4. Hyper acute and acute care: 4.10 Prevention and complications

Guidelines

NICE guideline Venous thromboembolism in over 16s: reducing the risk of hospital-acquired deep vein thrombosis or pulmonary embolisms [NG89] 2019. https://www.nice.org.uk/guidance/ng89

NICE clinical guidance Falls in older people: assessing risk and prevention [CG161] 2013. https://www.nice.org.uk/Guidance/CG161

NICE guideline Stroke and transient ischaemic attack in over 16s: diagnosis and initial management [NG128] 2019: 1.3 Specialist care for people with acute stroke; 1.5 Maintenance or restoration of homeostasis; 1.7 Optimal positioning and early mobilisation for people with acute stroke; 1.9 Movement; 1.10 Self-care. https://www.nice.org.uk/guidance/NG128

RCP National Clinical Guidelines for stroke 5th edition 2016: 3.10 Acute stroke care; 3.12 Early mobilisation. https://www.strokeaudit.org/SupportFiles/Documents/Guidelines/2016-National-Clinical-Guideline-for-Stroke-5t-(1).aspx

Evidence and other resources

AVERT Trial Collaboration group. Efficacy and safety of very early mobilisation within 24 h of stroke onset (AVERT): a randomised controlled trial. Lancet. 2015; 386(9988):46-55. Erratum in: Lancet. 2015 Jul 4;386(9988):30. Erratum in: Lancet. 2017 May 13;389(10082):1884. PMID: 25892679. https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(15)60690-0/fulltext

Turner N, Pickering D, Jones K. Physiotherapists' experiences of early mobilization after stroke thrombolysis in England and Wales: A qualitative study. . Physiother Theory Pract. 2020; 31:1-8. https://www.tandfonline.com/doi/abs/10.1080/09593985.2020.1799462?journalCode=iptp20

Bray BD, Smith CJ, Cloud GC On behalf of the SSNAP Collaboration, et al. The association between delays in screening for and assessing dysphagia after acute stroke, and the risk of stroke-associated pneumonia. Journal of Neurology, Neurosurgery & Psychiatry 2017; 88:25-30. https://jnnp.bmj.com/content/88/1/25

Healthcare Safety Investigation Brange (HSIB). Investigation into management of venous thromboembolism risk in patients following thrombolysis for an acute stroke. 2020. https://www.hsib.org.uk/investigations-and-reports/management-of-venous-thromboembolism-risk-in-patients-following-thrombolysis-for-an-acute-stroke/

4. Hyper acute and acute care: 4.11 Continence management

Guidelines

NICE Pathways Urinary incontinence in neurological disease overview 2019 https://pathways.nice.org.uk/pathways/urinary-incontinence-in-neurological-disease

NICE clinical guidance Urinary incontinence in neurological disease: assessment and management [CG148] 2012. https://www.nice.org.uk/guidance/cg148

Pressure ulcers: prevention and management [CG179] 2014. https://www.nice.org.uk/Guidance/CG179

Stroke Association. Continence problems after Stroke. Version 2.1 April 2018. https://www.stroke.org.uk/sites/default/files/user_profile/f12_continence_v2.1_8pp_web.pdf

Evidence and other resources

Thomas LH et al. Interventions for treating urinary incontinence after stroke in adults. Cochrane Database of Systematic Reviews. 2019; Issue 2. https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD004462.pub4/full

4. Hyper acute and acute care: 4.12 Swallowing and nutrition

Guidelines

NICE guideline Stroke and transient ischaemic attack in over 16s: diagnosis and initial management [NG128] 2019: 1.6 Nutrition and hydration; 1.8 Avoiding aspiration pneumonia. https://www.nice.org.uk/guidance/NG128

NICE guideline Stroke rehabilitation in adults [CG162] 2013: 1.7 Swallowing. https://www.nice.org.uk/guidance/cg162

National Stroke Programme Recommendations for the Management of Nutrition and Hydration in Patients with Stroke – A Guidance Document. Version 1. 2019. https://www.hse.ie/eng/about/who/cspd/ncps/stroke/resources/recommendations-for-the-management-of-nutrition-and-hydration-in-patients-with-stroke.pdf

National Clinical Programme for Stroke (NCP-S) National guideline for swallow screening in stroke 2017 [CSPD007/2017] May 2017 https://www.hse.ie/eng/services/publications/clinical-strategy-and-programmes/national-guideline-for-swallow-screening-in-stroke-hse.pdf

Evidence and other resources

Ojo O, Brooke J. The use of enteral nutrition in the management of stroke. Nutrients. 201; 8(12):827. https://www.mdpi.com/2072-6643/8/12/827/htm

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Paley L et al. Associations Between 30-Day Mortality, Specialist Nursing, and Daily Physician Ward Rounds in a National Stroke Registry. Stroke. 2018; 49(9):2155-21. https://www.ahajournals.org/doi/full/10.1161/STROKEAHA.118.021518

4. Hyper acute and acute care: 4.13 End of life care

Guidelines

RCP National Clinical Guidelines for stroke 5th edition 2016: 2.15 End-of-life (palliative) care. https://www.strokeaudit.org/SupportFiles/Documents/Guidelines/2016-National-Clinical-Guideline-for-Stroke-5t-(1).aspx

NICE quality standard End of life care for adults [QS13] 2017. https://www.nice.org.uk/guidance/qs13

NICE guideline End of life care for adults: service delivery [NG142] 2019. https://www.nice.org.uk/guidance/NG142

NICE guideline Care of dying adults in the last days of life [NG31] 2015. https://www.nice.org.uk/guidance/ng31

Evidence and other resources

Connolly T et al. The experience of uncertainty for patients, families and healthcare providers in post-stroke palliative and end-of-life care: a qualitative meta-synthesis, Age and Ageing. 2021; 50(2) 534–545. https://academic.oup.com/ageing/article-abstract/50/2/534/5987091

Cowey E, et al. Palliative care after stroke: A review. International Journal of Stroke. 2021. 16(6):632-639. https://journals.sagepub.com/doi/pdf/10.1177/17474930211016603

4. Hyper acute and acute care: 4.14 Discharge planning

Guidelines

NICE guideline Stroke rehabilitation in adults [CG162] 2013: 1.1 Organising health and social care for people needing rehabilitation after stroke; 1.2 Planning and delivering stroke rehabilitation. https://www.nice.org.uk/guidance/cg162

RCP National Clinical Guidelines for stroke 5th edition 2016: 2.7 Transfers of care from hospital to home. https://www.strokeaudit.org/SupportFiles/Documents/Guidelines/2016-National-Clinical-Guideline-for-Stroke-5t-(1).aspx

Evidence and other resources

Hodson T, Aplin T, Gustafsson L. Understanding the dimensions of home for people returning home post stroke rehabilitation. British Journal of Occupational Therapy. 2016;79(7):427-433. doi:10.1177/0308022615619420. https://journals.sagepub.com/doi/abs/10.1177/0308022615619420

Odile C, et al. Socio-environmental predictive factors for discharge destination after inpatient rehabilitation in patients with stroke: a systematic review and meta-analysis. Disability and Rehabilitation. 2021 DOI: 10.1080/09638288.2021.1923838. https://www.tandfonline.com/doi/full/10.1080/09638288.2021.1923838

5. Rehabilition and life after stroke: 5.1 Inpatient rehabilitation

Guidelines

NICE guideline Stroke rehabilitation in adults [CG162] 2013: 1.1 Organising health and social care for people needing rehabilitation after stroke. https://www.nice.org.uk/guidance/cg162

British Society of Rehabilitation Medicine. Rehabilitation for patients in the acute care pathway following server disabling illness or injury: BSRM core standard for specialist rehabilitation. October 2014 [online] https://www.bsrm.org.uk/downloads/specialist-rehabilitation-prescription-for-acute-care-28-11-2014-ja--(ap1-redrawn).pdf

Evidence and other resources

McGlinchey MP et al. Physiotherapy provision to hospitalised stroke patients: Analysis from the UK Sentinel Stroke National Audit Programme. Eur Stroke J. 2019; 4(1):75-84. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6533865/

Chouliara N et al. How do patients spend their time in stroke rehabilitation units in England? The REVIHR study. Disability and Rehabilitation. 2019. https://www.tandfonline.com/doi/full/10.1080/09638288.2019.1697764

Jones F, Gombert K, Honey S et al. Addressing inactivity after stroke: The Collaborative Rehabilitation in Acute Stroke (CREATE) study. Int J Stroke. 2020. https://journals.sagepub.com/doi/full/10.1177/1747493020969367

Clarke DJ et al. Why do stroke survivors not receive recommended amounts of active therapy? Findings from the ReAcT study, a mixed-methods case-study evaluation in eight stroke units. Clinical Rehabilitation. 2018; 32(8): 1119-1132. https://journals.sagepub.com/doi/10.1177/0269215518765329

5. Rehabilition and life after stroke: 5.2 Psychological services

Guidelines

NICE Quality standard Stroke in adults [QS2] 2010: Quality statement 3: Access to a clinical psychologist. https://www.nice.org.uk/guidance/qs2

RCP National Clinical Guidelines for stroke 5th edition 2016: 2.12 Psychological care – organisation and delivery. https://www.strokeaudit.org/SupportFiles/Documents/Guidelines/2016-National-Clinical-Guideline-for-Stroke-5t-(1).aspx

NHS Seven Day Services Clinical Standards 2017; 7. Mental Health. https://www.england.nhs.uk/wp-content/uploads/2017/09/seven-day-service-clinical-standards-september-2017.pdf

NHS Improvement Psychological care after stroke Improving stroke services for people with cognitive and mood disorders 2011. https://www.nice.org.uk/media/default/sharedlearning/531_StrokePsychologicalSupportFINAL.pdf

R&I Demand Signalling research question

1. Could the 'change and resilience training' already being used for the wider workforce be developed and used as part of the rehabilitation process for stroke survivors, where appropriate working alongside their unpaid family carers, to help with mental well-being and quality of life?
2. Do group based self-management interventions (e.g. Mindfulness Based Stress Reduction) reduce anxiety and depression in adults affected by stroke?
3. What are the most effective behavioural (physical and psychological) therapies (at what dose and time post-stroke) and how can they alleviate the long-term impact of stroke on different groups of stroke survivors?

Evidence and other resources

Burton L-J, Tyson S. Screening for mood disorders after stroke: a systematic review of psychometric properties and clinical utility. Psychological Medicine 2015; 45(1); 29-49. https://doi.org/10.1017/S0033291714000336

Boakye NT, Scott R et al. All change: a stroke inpatient service's experience of a new clinical neuropsychology delivery model. BMJ Quality Improvement Report. 2019. https://bmjopenquality.bmj.com/content/8/1/e000184

Poppleton A, t al. Depression after stroke: The role of the GP. InnovAiT. 2018;11(10):563-568. doi:10.1177/1755738018789442. https://journals.sagepub.com/doi/10.1177/1755738018789442

5. Rehabilition and life after stroke: 5.3 Vocational services

Guidelines

NICE guideline Stroke rehabilitation in adults [CG162] 2013: Key priorities for implementation; 1.10 Self-care. https://www.nice.org.uk/guidance/cg162

NICE Quality standard Stroke in adults [QS2] 2010: Quality statement 5: Return to work. https://www.nice.org.uk/guidance/qs2

RCP National Clinical Guidelines for stroke 5th edition 2016: 4.1 Activities of daily living. https://www.strokeaudit.org/SupportFiles/Documents/Guidelines/2016-National-Clinical-Guideline-for-Stroke-5t-(1).aspx

Evidence and other resources

Baldwin C, Brusco NK. The effect of vocational rehabilitation on return-to-work rates post stroke: a systematic review. Topics in stroke rehabilitation. 2011; 1:18(5):562-72. https://www.tandfonline.com/doi/abs/10.1310/tsr1805-562

Radford KA, et al. An individually randomised controlled multi-centre pragmatic trial with embedded economic and process evaluations of early vocational rehabilitation compared with usual care for stroke survivors: study protocol for the RETurn to work After stroKE (RETAKE) trial. Trials. 2020; 21,1010. https://doi.org/10.1186/s13063-020-04883-1

Radford K, t al. Describing Return to Work after Stroke: A Feasibility Trial of 12-month Outcomes. Journal of Rehabilitation Medicine. 2020; 52(4), https://doi.org/10.2340/16501977-2647

Martin-Saez MM, James N. The experience of occupational identity disruption post stroke: a systematic review and meta-ethnography. Disability and Rehabilitation. 2021; 43((8):1044-1055. https://www.tandfonline.com/doi/abs/10.1080/09638288.2019.1645889

5. Rehabilition and life after stroke: 5.4 ICSS and ESD

Guidelines

NICE guideline Stroke rehabilitation in adults [CG162] 2013: Key priorities for implementation; 1.1 Organising health and social care for people needing rehabilitation after stroke; 1.2 Planning and delivering stroke rehabilitation. https://www.nice.org.uk/guidance/cg162

NICE Quality standard Stroke in adults [QS2] 2010: Quality statement 4: Early supported discharge; Quality statement 6: Regular review of rehabilitation goals; Quality statement 7; Regular review of health and social care needs. . https://www.nice.org.uk/guidance/qs2

RCP National Clinical Guidelines for stroke 5th edition 2016: 2.7 Transfers of care from hospital to home; 2.8 Service governance and quality improvement; 2.10 Rehabilitation approach – goal setting; 2.16 Carers; 2.17 People with stroke in care homes; 4 Recovery and Rehabilitation; 6 Commissioning of Stroke Services. https://www.strokeaudit.org/SupportFiles/Documents/Guidelines/2016-National-Clinical-Guideline-for-Stroke-5t-(1).aspx

NHS Seven Day Services Clinical Standards 2017; 1. Patient Experience https://www.england.nhs.uk/wp-content/uploads/2017/09/seven-day-service-clinical-standards-september-2017.pdf

Greater Manchester, Lancashire & South Cumbria Strategic Clinical Network. Evaluation of Community Stroke Rehabilitation in Greater Manchester and Proposal of an Integrated Community Stroke Service (Combined ESD and Non-ESD Model). 2014. https://www.gmisdn.org.uk/pathway/

National Integrated Community Stroke Service Model 2022 https://future.nhs.uk/connect.ti/strokecommunity/viewdocument?docid=98352773 (login required)

R&I Demand Signalling research question

What is the most effective way to deliver community-based stroke rehabilitation (e.g. including tele-rehabilitation) and how can we enhance stroke survivors' experience of the rehabilitation pathway?

Evidence and other resources

NICE Shared Learning 2020: Supporting Carers in the Stroke Early Supported Discharge Service. https://www.nice.org.uk/sharedlearning/supporting-carers-in-the-stroke-early-supported-discharge-service

Fisher RJ et al. Effectiveness of Stroke Early Supported Discharge: Analysis From a National Stroke Registry. Circ Cardiovasc Qual Outcomes. 2020; 17. https://www.ahajournals.org/doi/10.1161/CIRCOUTCOMES.119.006395

Langhorne P, Baylan S. Early supported discharge services for people with acute stroke. Cochrane Database of Systematic Reviews. 2017, Issue 7. https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD000443.pub4/full

NICE Shared learning Supporting Carers in the Stroke Early Supported Discharge Service 2020. https://www.nice.org.uk/sharedlearning/supporting-carers-in-the-stroke-early-supported-discharge-service

East Midlands Academic Health Science Network Stroke Rehabilitation Resources https://emahsn.org.uk/our-work/previous-projects/503-stroke-rehabilitation-resources/966-stroke-rehabilitation-resources

Consensus documents

Fisher RJ et al. A Consensus on Stroke Early Supported Discharge. Stroke. 2011. 42:1392-1397. https://www.ahajournals.org/doi/10.1161/STROKEAHA.110.606285

Fisher RJ et al. The implementation of evidence based rehabilitation services for stroke survivors living in the community. The results of a Delphi consensus process. Clinical Rehabilitation. 2013; 27(8): 741-749. https://journals.sagepub.com/doi/pdf/10.1177/0269215512473312

5. Rehabilition and life after stroke: 5.6 Intensity and responsiveness

Guidelines

NICE guideline Stroke rehabilitation in adults [CG162] 2013: Key priorities for implementation; 1.1 Organising health and social care for people needing rehabilitation after stroke; 1.2 Planning and delivering stroke rehabilitation. https://www.nice.org.uk/guidance/cg162

NICE Stroke in adults [QS2] 2016; Quality statement 2. https://www.nice.org.uk/guidance/qs2/chapter/Quality-statement-2-Intensity-of-stroke-rehabilitation

RCP National Clinical Guidelines for stroke 5th edition 2016: 2.8 Service governance and quality improvement; 2.10 Rehabilitation approach – goal setting; 2.16 Carers; 4 Recovery and Rehabilitation; 6 Commissioning of Stroke Services. https://www.strokeaudit.org/SupportFiles/Documents/Guidelines/2016-National-Clinical-Guideline-for-Stroke-5t-(1).aspx

NHS Seven Day services clinical Standards 2017; 1. Patient Experience. https://www.england.nhs.uk/wp-content/uploads/2017/09/seven-day-service-clinical-standards-september-2017.pdf

R&I Demand Signalling research question

1. What are the optimal ways to manage and treat the non-apparent (hidden) effects of stroke, including: incontinence, fatigue, emotional ability, cognitive deficit, memory problems, dysphasia and secondary complications?
2. What are the outcomes that are most important to stroke survivors and their carers', and how can they be best supported to achieve these?

Evidence and other resources

Lohse KR, Lang CE, Boyd LA. Is more better? Using metadata to explore dose-response relationships in stroke rehabilitation. Stroke. 2014; 45(7):2053-2058. https://pubmed.ncbi.nlm.nih.gov/24867924/

Care Quality Commission (CQC). Supporting life after stroke: a review of services for people who have had a stroke and their carers. 2011. https://www.cqc.org.uk/sites/default/files/documents/supporting_life_after_stroke_national_report.pdf

5. Rehabilition and life after stroke: 5.7 Follow-up reviews

Guidelines

NICE guideline Stroke rehabilitation in adults [CG162] 2013: Key priorities for implementation; 1.1 Organising health and social care for people needing rehabilitation after stroke; 1.2 Planning and delivering stroke rehabilitation; 1.3 Providing support and information; 1.11 Long-term health and Social https://www.nice.org.uk/guidance/cg162

NICE Quality standard Stroke in adults [QS2] 2010: Quality statement 6: Regular review of rehabilitation goals; Quality statement 7: Regular review of health and social care needs. https://www.nice.org.uk/guidance/qs2

RCP National Clinical Guidelines for stroke 5th edition 2016: 2.8 Service governance and quality improvement; 5 Long-term Management and Secondary Prevention. https://www.strokeaudit.org/SupportFiles/Documents/Guidelines/2016-National-Clinical-Guideline-for-Stroke-5t-(1).aspx

NHS Seven Day Services Clinical Standards 2017; 10. Quality Improvement. https://www.england.nhs.uk/wp-content/uploads/2017/09/seven-day-service-clinical-standards-september-2017.pdf

BASP Clinical Standards Committee Recommendations for Providing Six Month Reviews Post Stroke 2020. https://www.basp.org/wp-content/uploads/2017/07/BASP-Clinical-Standards-Commitee-Recommendations-for-providing-six-month-follow-up-assessment-post-stroke-2017.pdf

NHS England Practical guidance supporting the 2019-20 CQUIN: Six month reviews for stroke survivors 2019. https://www.england.nhs.uk/wp-content/uploads/2019/04/cquin-1920-6-month-reviews-for-stroke-survivors-guidance.pdf

Evidence and other resources

Tyson SF, Burton LJ, McGovern A, Sharifi S. Service users' views of the assessment process in stroke rehabilitation. Clin Rehabil. 2014; 28(8):824-831. https://pubmed.ncbi.nlm.nih.gov/24572140/

Patchwood E, Woodward-Nutt K, Rothwell K, Perry C, Tyrrell P, Bowen A. Six-month reviews for stroke survivors: a study of the modified Greater Manchester Stroke Assessment Tool with care home residents. Clin Rehabil. 2020; 34(5):677-687. https://journals.sagepub.com/doi/10.1177/0269215520912515

Abrahamson V, Wilson P. How unmet are unmet needs post-stroke? A policy analysis of the six-month review. BMC Health Serv Res. 2019; 19, 480. https://doi.org/10.1186/s12913-019-4210-2

Abrahamson V, Wilson P. Positioning the six-month review in the recovery process post-stroke: The ideology of personal responsibility. Health and Social Care in the Community. 2019; (1). https://onlinelibrary.wiley.com/doi/abs/10.1111/hsc.12677

5. Rehabilition and life after stroke: 5.8 Life after Stroke (LaS) services

Guidelines

NICE guideline Stroke rehabilitation in adults [CG162] 2013: 1.1 Organising health and social care for people needing rehabilitation after stroke; 1.3 Providing support and information; 1.4 Cognitive functioning; 1.11 Long-term health and social support. https://www.nice.org.uk/guidance/cg162

RCP National Clinical Guidelines for stroke 5th edition 2016: 2.7 Transfers of care from hospital to home; 5.9 Life after stroke. https://www.strokeaudit.org/SupportFiles/Documents/Guidelines/2016-National-Clinical-Guideline-for-Stroke-5t-(1).aspx

Stroke Association. Life After Stroke Services. https://www.stroke.org.uk/professionals/life-after-stroke-services

Evidence and other resources

Care Quality Commission (CQC). Supporting life after stroke: a review of services for people who have had a stroke and their carers. 2011. https://www.cqc.org.uk/sites/default/files/documents/supporting_life_after_stroke_national_report.pdf

Stroke Alliance for Europe. Introducig the Life After stroke Series: Stroke Survivor Stories. https://www.elasf.org/stroke-survivor-stories/

Forster A, et al. Longer-term health and social care strategies for stroke survivors and their carers: the LoTS2Care research programme including cluster feasibility RCT. Southampton (UK): NIHR Journals Library; 2021 Mar. (Programme Grants for Applied Research, No. 9.3.) Workstream 2: national survey of post-discharge stroke services, and focus groups and interviews to identify service needs, barriers and enablers. https://www.ncbi.nlm.nih.gov/books/NBK569205/

5. Rehabilition and life after stroke: 5.9 Performance monitoring

Guidelines

Sentinel Stroke National Audit Programme (SSNAP) https://www.strokeaudit.org/

Evidence and other resources

SSNAP. How is SSNAP supporting the NHS Long Term Plan? https://www.strokeaudit.org/SupportFiles/Documents/miscellaneous/Impact_report_LTP.aspx

SSNAP. Post-Acute National Audit 2021. November 2021. https://www.strokeaudit.org/results/PostAcute2021.aspx

6. Workforce

Guidelines

British Association of Stroke Physicians (BASP). Meeting the Future Consultant Workforce Challenges: Stroke Medicine. Stroke Medicine Consultant Workforce Requirements 2019-2022. 2019. https://www.basp.org/wp-content/uploads/2019/07/BASP-Stroke-Medicine-Workforce-Requirements-Report-FINAL.pdf

NHS England Stroke Services: Configuration Decision Support Guide 2018; 4. Workforce. https://www.england.nhs.uk/mids-east/wp-content/uploads/sites/7/2018/03/stroke-services-configuration-decision-support-guide.pdf

RCP National Clinical Guidelines for stroke 5th edition 2016: 2.3 Specialist stroke services; 2.4 Resources. https://www.strokeaudit.org/SupportFiles/Documents/Guidelines/2016-National-Clinical-Guideline-for-Stroke-5t-(1).aspx

HEE ACP Guidelines https://www.hee.nhs.uk/sites/default/files/documents/Multi-professional%20framework%20for%20advanced%20clinical%20practice%20in%20England.pdf

Evidence and other resources

Clifton A. Mechanical thrombectomy services: can the UK meet the challenge?. BMJ Practical Neurology. 2017; 250-251. https://pn.bmj.com/content/17/4/250.abstract

Christopher S and Ashman G. The impact of an Advanced Nurse Practitioner training programme in an acute stroke service. British Journal of Neuroscience Nursing. 2018; 14.3; 130-134. https://www.magonlinelibrary.com/doi/abs/10.12968/bjnn.2018.14.3.130

Koka A, et al. Teaching the National Institutes of Health Stroke Scale to Paramedics (E-Learning vs Video): Randomized Controlled Trial. Journal of medical Internet research. 2020; 22.6; e18358. https://www.jmir.org/2020/6/e18358/

Kotecha J, et al. "What do neurosurgical trainees think about neuro-interventional training and service provision in the United Kingdom?." Surgical neurology international 11. 2020. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7710453/

Toolkits

HEE Star Tool https://www.hee.nhs.uk/our-work/hee-star

HEE stroke resources https://www.hee.nhs.uk/stroke

HEE Star tool user guide https://www.hee.nhs.uk/sites/default/files/documents/HEE%20Star%20user%20guide%20v2.0.pdf

Stroke Specific Education Framework and Online Toolkit https://stroke-education.org.uk/

Stroke e-Learning for healthcare https://www.e-lfh.org.uk/programmes/stroke/.

7. Medicines Optimisation

Guidelines

NICE Medicines optimisation: the safe and effective use of medicines to enable the best possible outcomes [NG5] 2015. https://www.nice.org.uk/guidance/NG5

NICE Quality standard Medicines optimisation [QS120] 2016. https://www.nice.org.uk/guidance/qs120

NICE Medicines adherence: involving patients in decisions about prescribed medicines and supporting adherence [CG76] 2009. https://www.nice.org.uk/Guidance/CG76

NICE Decision-making and mental capacity [NG108] 2018. https://www.nice.org.uk/guidance/ng108

Patient Activation Measure: Patient activation and PAM FAQs. https://www.england.nhs.uk/personalisedcare/supported-self-management/patient-activation/pa-faqs/#Q3

Department of Health & Social Care. Community Pharmacy Contractual Framework: 2019 to 2024. 2019. https://www.gov.uk/government/publications/community-pharmacy-contractual-framework-2019-to-2024

NHS England. Medicines Optimisation. https://www.england.nhs.uk/medicines-2/medicines-optimisation/

NHS England. Medicines optimisation dashboard. https://www.england.nhs.uk/medicines-2/medicines-optimisation/dashboard/

Evidence and other resources

Hill J et al. Mediators, confounders and effectiveness of interventions for medication adherence after stroke. British Journal of Neuroscience Nursing. 2020; 16.Sup5: S18-S24. https://www.magonlinelibrary.com/doi/abs/10.12968/bjnn.2020.16.Sup5.S18

Arkan G et al. Investigation of Medication Adherence and Factors Affecting It in Patients With Stroke. Journal of Neuroscience Nursing. 2022; 54.1: 35-41. https://journals.lww.com/jnnonline/Citation/2022/02000/Investigation_of_Medication_Adherence_and_Factors.8.aspx

Hansen CR et al. Identification of behaviour change techniques in deprescribing interventions: a systematic review and meta-analysis.British journal of clinical pharmacology. 2018; 84.12: 2716-2728. https://bpspubs.onlinelibrary.wiley.com/doi/full/10.1111/bcp.13742

Redmond P, t al. Impact of medication reconciliation for improving transitions of care. Cochrane Database Syst Rev. 2018 Aug 23;8(8):CD010791. doi: 10.1002/14651858.CD010791.pub2. PMID: 30136718; PMCID: PMC6513651. https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD010791.pub2/full

The impact of pharmacists-led medicines reconciliation on healthcare outcomes in secondary care: A systematic review and meta-analysis of randomized controlled trials. PLOS ONE. 2018. https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0193510

8. Technology

Guidelines

RCP National Clinical Guidelines for stroke 5th edition 2016; 2.4 Resources. https://www.strokeaudit.org/SupportFiles/Documents/Guidelines/2016-National-Clinical-Guideline-for-Stroke-5t-(1).aspx

NHS England Stroke Services: Configuration Decision Support Guide 2018; 3.9 Stroke telemedicine guidelines. https://www.england.nhs.uk/mids-east/wp-content/uploads/sites/7/2018/03/stroke-services-configuration-decision-support-guide.pdf

Gov.UK Guidance: Guidelines for AI procurement. June 2020. https://www.gov.uk/government/publications/guidelines-for-ai-procurement/guidelines-for-ai-procurement

Evidence and other resources

Guberina N, Dietrich U, Radbruch A, Goebel J, Deuschl C, Ringelstein A, et al. Detection of early infarction signs with machine learning-based diagnosis by means of the Alberta Stroke Program Early CT score (ASPECTS) in the clinical routine. Neuroradiology. 2018; 60:889-901. https://link.springer.com/article/10.1007/s00234-018-2066-5

Chriashkova J et al. e-ASPECTS Improves Sensitivity to Early Ischemic Injury on Acute Computed Tomography Scans. Stroke. 2019;50 presented at the International Stroke Conference 2019. https://www.ahajournals.org/doi/10.1161/str.50.suppl_1.WMP14

Grunwald IQ, Kulikovski J, Reith W, Gerry S, Namias R, Politi M, et al. Collateral Automation for Triage in Stroke: Evaluating Automated Scoring of Collaterals in Acute Stroke on Computed Tomography Scans. Cerebrovasc Dis. 2019; 1-6. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6878757/

Oxford Academic Health Science Network. Harnessing AI technology to speed up stroke care and reduce costs. 2020. https://www.oxfordahsn.org/our-work/covid-19/covid-19-case-studies/ai-technology-speeds-up-stroke-care-and-reduces-costs/

Laver KE, Adey-Wakeling Z, Crotty M, Lannin NA, George S, Sherrington C. Telerehabilitation services for stroke. Cochrane Database Syst Rev. 2020; 31;1(1). https://www.cochrane.org/CD010255/STROKE_telerehabilitation-services-stroke

Useful links

Charities

Stroke Association	The UK's leading stroke charity. They deliver stroke services across the UK, campaign for better stroke care, and invest in research https://www.stroke.org.uk/.
Different Strokes	Different Strokes promotes and supports independent stroke recovery for younger stroke survivors across the UK https://differentstrokes.co.uk/.
Headway	Headway - the brain injury association - is a charity set up to give help and support to people affected by brain injury https://www.headway.org.uk/.
SameYou	SameYou is working to develop better recovery treatments for survivors of brain injury and stroke https://www.sameyou.org/.
ARNI	ARNI provides specialist rehabilitation and exercise support after hospital and community physiotherapy finishes https://arni.uk.com/.
SayAphasia	Helpng people with aphasia adapt to their new way of life and regain their independence and confidence https://www.sayaphasia.org/.

FutureNHS (NHS login required)

National RightCare	Provides access to RightCare data files, tools, and methodology https://future.nhs.uk/NationalRightCare/grouphome.
Stroke Network	Provides the latest information from the National Stroke Programme working groups and includes a discussion forum for the stroke community https://future.nhs.uk/strokecommunity/grouphome.

Glossary

A&E	Accident and Emergency
AF	Atrial Fibrillation
AHSN	Academic Health Science Networks
AI	Artificial Intelligence
ASC	Acute Stroke Centre
ASU	Acute Stroke Unit
BAME	Black, Asian, and Minority Ethnic
BASP	British Association of Stoke Physicians
BSA	Business Services Authority
CCG	Clinical Commissioning Groups
CSC	Comprehensive Stroke Centre
CT	Computerised Tomography
CTA	Computed Tomography Angiography
CTP	Computed Tomography Perfusion
CVD	Cardiovascular Disease
DID	Diagnostic Imaging Dataset
ESD	Early Supported Discharge
F.A.S.T. test	Face. Arm. Speech. Time.
GIRFT	Getting It Right First Time
HASU	Hyper Acute Stroke Unit
HEE	Health Education England
HES	Hospital Episode Statistics
ICS	Integrated Care System
ICSS	Integrated Community Stroke Services
ISDN	Integrated Stroke Delivery Networks
LaS	Life after stroke
MDM	Multidisciplinary meeting
MDT	Multidisciplinary Team
MRA	Magnetic Resonance Angiography
MRI	Magnetic Resonance Imaging
NICE	National Institute for Health and Care Excellence
NIHR	National Institute of Health Research
NOSIP	National Optimal Stroke Imaging Pathway
NSSM	National Stroke Service Model
PAM	Patient Activation Measure
QOF	Quality and Outcomes Framework
RCP	Royal College of Physicians
SSEF	Stroke Specific Education Framework
SSNAP	Sentinel Stroke National Audit Programme
SUS	Secondary Uses Service
TIA	Transient Ischaemic Attack
VTE	Venous Thromboembolism