

National Stroke Service Model

Integrated Stroke Delivery Networks

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Revision history

Version	Date	Summary of changes
1.0	16/09/2020	First new draft of amalgamated service specs. This version includes sections of the resource pack and the KCL evidence report.
2.0	30/09/2020	First review
3.0	5/10/20	Consistency / accuracy

Approved by

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National Stroke Service Model

Integrated Stroke Delivery Networks (ISDNs)

Part 1: ISDN composition and core functions

“Our Long Term Plan for the NHS recognises the importance of tackling the growing impact of stroke in England. Integrated Stroke Delivery Networks 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. By driving improvements in devastating conditions like stroke, we will save half a million lives over the next decade, and give hundreds of thousands of stroke survivors the chance of a better recovery.”

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Overview

The [NHS Long Term Plan](#) (LTP (2019) set out the ambitions for the NHS over the next 10 years, identifying [stroke as a clinical priority](#). It 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 LTP highlights the need for Integrated Stroke Delivery Networks (ISDNs) in all areas of England, bringing people and organisations together to deliver the best possible care for their population.

ISDNs will include providers and commissioners of services across the whole stroke pathway. ISDNs will be responsible for designing and delivering optimal stroke pathways, which will ensure that more people who experience a stroke receive high-quality specialist care, from pre-hospital, through to rehabilitation and life after stroke. Their development is key to delivering on the LTP commitments for stroke

Clinical and operational networks based on patient flows are widely recognised as an effective model for improving standards of health and care outcomes for defined groups of patients. Stroke is no exception, and the development of ISDNs will be essential to facilitate the delivery of the LTP commitments for stroke. Effective delivery of high-quality stroke services should be based on a networked approach, and will reduce stroke mortality and disability, as well as reducing the burden stroke places on families and carers, on the health and social care system, and on wider society.

There is strong evidence that investigations and interventions, such as brain scanning and thrombolysis, can best be delivered as part of a 24/7 networked service, including Comprehensive and Acute Stroke Centres (CSC, ASC) of a sufficient size to ensure expertise, efficiency and a sustainable workforceⁱ. Networking and pathway optimisation of stroke services, to maximise patient benefit, remains incomplete and pathways are insufficient in many regions to accommodate the new life-changing intervention of mechanical thrombectomy; current provision lagging behind other European countries. The Sentinel Stroke National Audit Programme (SSNAP) underlines a stalling of improvement in timely admission to stroke units and overall thrombolysis deliveryⁱⁱ.

Key services for stroke rehabilitation, psychological and ongoing 'life after stroke' care have not yet been able to mirror improvements seen in acute care and prevention, with nearly half of all stroke survivors feeling abandoned on leaving hospitalⁱⁱⁱ.

Integrated stroke delivery networks (ISDNs), involving all services from pre-hospital through to early supported discharge, community specialist stroke-skilled rehabilitation

and life after stroke support, will deliver optimal stroke pathways and support the delivery of the NHS's seven-day standards for stroke care;^{iv} delivering safe and effective treatments to those who suffer a stroke.

Supporting evidence

Networked configurations with Hyper Acute Stroke Units (HASUs) have led to better patient outcomes which include a 5% relative reduction in mortality at 90 days, and reduced length of stay ^{vi}. An evaluation of networked provision in Northumbria demonstrates value from a networked approach in rural areas^{vii}. The average annual benefit of national pathway optimisation has been estimated to be around £48m, accounting for the increased ambulance costs, transition costs, reduction in staff costs and future tariff payments.

The current evidence from network optimisation was captured prior to the national commissioning of mechanical thrombectomy. As such, the clinical and cost effectiveness of thrombectomy are not included in the published reviews of network effectiveness.

Stroke networks, with full national coverage, will be essential to enable the delivery of thrombectomy to all patients amenable to this intervention, demonstrating a significant reduction in disability.

ISDN Aims and Objectives

The overarching aim of an ISDN is to improve the quality of stroke care, by improving clinical outcomes, patient experience and patient safety. The ISDN does this by bringing key stakeholders together, to facilitate a collaborative approach to service improvement of the whole stroke pathway ensuring a **patient centred, evidence based** approach to **delivering transformational change**.

Key deliverables for Integrated Stroke Delivery Networks

- Best practice personalised **stroke pathways configured and managed** from pre-hospital care onward, including ambulance, thrombectomy, Early Supported Discharge (ESD) and six-month reviews within initial implementation, 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** meeting the needs of clinicians, commissioners and patients describing the quality and outcomes of care provided

To improve healthcare quality and experience ISDNs should have the following objectives;

Objectives

1	<p>Leadership</p> <ul style="list-style-type: none"> • Provision of robust clinical and stroke programme leadership. This may include both medical, nursing and therapy senior leadership to ensure both the acute and community pathways are given equal focus. • Developing, and agreeing with system leaders, a coordinated approach to network resourcing, to secure the best outcomes for patients.
2	<p>Strategic approach</p> <ul style="list-style-type: none"> • Supporting STP/ICSs to develop a strategic approach to improving local stroke pathways, in line with the ISDN pathway specification (Part 2 of this document). • Ensure collaborative working with STP/ICS and provider workforce leads to manage system capacity and demand. Key actions may be to: <ul style="list-style-type: none"> ○ ensure collaborative activity monitoring and demand forecasting ○ support/lead strategic capacity planning and development as appropriate ○ develop robust, creative and sustainable workforce plans which will deliver to the stroke service specification, based upon individual capabilities and development for all staff. • Horizon scanning – participating in national forums to ensure that as healthcare technologies advance and new intelligence is introduced, local workforce are supported to develop and deliver innovations in patient care.
3	<p>Optimal configuration and collaboration</p> <ul style="list-style-type: none"> • Supporting the delivery of an optimal configuration of stroke services within their geography to deliver sustainable models of care, including collaborative development of associated capital bids and cases for change. • Leading collaboration with all relevant stakeholders and partners. • Delivering specialist stroke-skilled integrated community rehabilitation pathways against a national standard needs-based service specification. • Identifying and managing cross-boundary and border issues and patient flows with neighbouring ISDNs, STP/ICSs, NHS regions, Voluntary Care Sector, Local Authorities, Wales and Scotland as appropriate. • Work collegiately with organisations and programmes that support stroke care. • Ensuring effective patient flows and care pathways across the ISDN with clinical collaboration and coordination between all stakeholders including the voluntary sector.
4	<p>Data, monitoring and reporting</p> <ul style="list-style-type: none"> • Ensuring full engagement with the Sentinel Stroke National Audit Programme (SSNAP), monitoring network performance and recommending or instigating appropriate improvement support. This would include supporting the delivery of regional recommendations suggested from the NHS England and Improvement and GIRFT Stroke Programme.

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| <ul style="list-style-type: none">• Supporting, monitoring and reporting of consistent, high quality stroke care by STPs/ICSs through the delivery of the national clinical standards for stroke. |
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ISDN Governance

- National oversight of ISDN performance will be via the NHS England and NHS Improvement Stroke Programme Delivery Board, which reports to the overarching CVD and Respiratory Programme Board; and will include the tracking of a set of key performance metrics reported by SSNAP.
- Regional oversight of ISDNs will be established through the regional CVD Respiratory Programme SRO. This regional oversight and support should ensure that plans defined for optimal service configuration, which may cross STP/ICS and existing network boundaries, will address the current variation in pre-hospital, acute and post-acute stroke provision.
- ISDNs will provide assurance on behalf of their STP/ICS on the quality of provision of stroke services, to the regional CVD Respiratory Programme SRO.
- The ISDN internal governance structure should comprise:
 - A multidisciplinary Steering/Oversight Group or Board with an agreed chair and nominated representatives from stakeholder organisations, which will oversee the governance of the ISDN
 - The executive SRO and chair will be identified from the ISDN's STP/ICS
 - A Core Group/ Clinical Reference Group (or similar name) which reports to the Steering Group/Board, made up of management and clinical representatives from all stakeholders, including non-NHS bodies alongside patient/carer voice, which will develop recommendations and plans to send to the Steering Group/Board for approval.
- A governance framework should be in place to clarify accountability and include operating principles, clinical governance, hosting arrangements, structure and scope, population covered, patient and stakeholder engagement, performance, monitoring and reporting, risk management, quality and service improvement, expected outputs and outcomes.
- ISDNs will accept collective ICS/STP delegated responsibility for stroke care across the population they serve.

- ISDNs will coordinate improvement in line with linked programmes reflecting national and local priorities, including diagnostic network 'lean imaging' pathways.

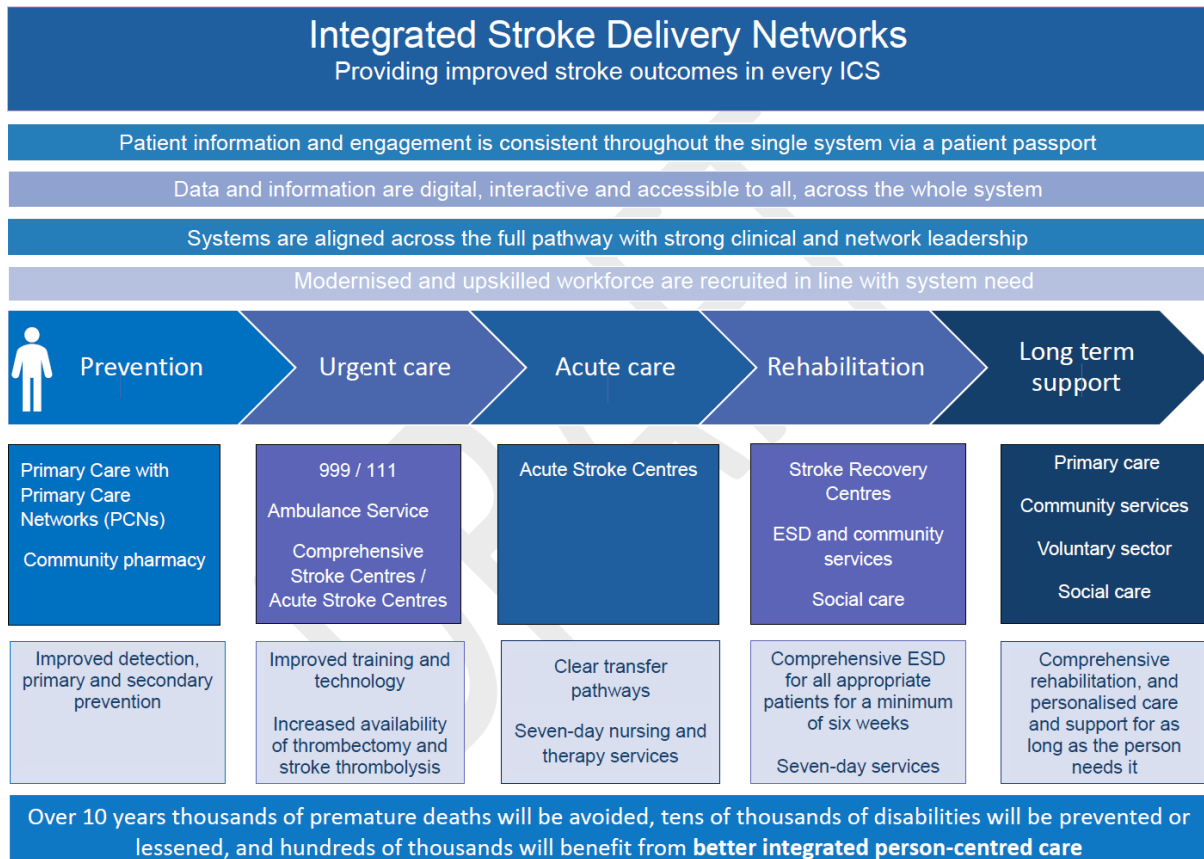
ISDN's will ensure that all referrers into and providers of stroke services are held jointly accountable for the networked delivery of care by the system as a whole, in line with population health and personalised outcome needs.

ISDN Structure

- Whilst thrombectomy is likely to be delivered in up to 30 centres nationally (22-23 Neurosciences centres plus an additional 5-7 non-neuroscience thrombectomy centres based on geographical and population modelling), all stroke receiving centres will require effective and well managed referral and repatriation pathways, ensuring access to thrombectomy for all patients 24/7. ISDN's should be aware of draft service specification timelines to achieve this objective within the Specialised Commissioning specification, and work to support the thrombectomy centres to deliver against these targets, which for some may require solutions crossing regional geographies.
- Models of care for rural areas may need a flexible and innovative approach to service and pathway delivery, which should be supported by each ISDN.
- Each ISDN should be based on between one and four ICS/STPs, based on the most appropriate patient pathways, flows and operational geographies.
- ISDN footprints should be co-designed by STP/ICSs and stakeholders and overseen through the regional CVD Respiratory Programme structure, supported with national modelling where appropriate, and taking into consideration existing networks, patient flows, thrombectomy centres and service configuration proposals.
- ICS/STPs should adopt a collaborative partnership approach to development of ISDNs and agreement of footprints, including MDT clinical, primary, secondary, tertiary, community, social care and voluntary sector perspectives.
- ISDNs should avoid duplication by making use of existing expertise and drawing on SCNs, as appropriate, in line with regional planning. ISDNs are anticipated to become the single network for stroke in each area, which may for instance mean pump-priming with SCN leadership and then permanently shifting stroke-specific SCN staff into an ISDN structure.
- Where an Operational Delivery Network (ODN) or similar operational network is already in existence, shifting to an ISDN format will present an opportunity for validation of STP/ICS strategic governance, footprints and appropriate

patient flow; including thrombectomy, which may require minimal or significant change as appropriate.

- ISDNs will include all relevant stakeholders including patients and the public from pre-hospital care through to community rehabilitation and life after stroke support.
- While most ISDNs will include a thrombectomy centre, all ISDNs must have identified access to one or more, with agreed repatriation protocols.



Patient and Public Voice in ISDNs

- Actively involving stroke survivors in discussion and decisions about stroke care is essential for developing stroke services that meet the needs of people affected by stroke. Healthy and at-risk citizens should also form part of co-production arrangements, ensuring the full pathway of care from CVD prevention onward is represented.
- The National Stroke Programme has been developed with stroke survivors, and there are two patient representatives on its Delivery Board.
- Local systems should ensure that decisions around stroke services are made with **effective involvement of people affected by stroke** as per best practice, and service change should be done with, not to, those potentially impacted.

- Voluntary and community sector (VCS) partners such as the [Stroke Association](#) or [Different Strokes](#) can work with and support ISDNs to identify and establish suitable patient involvement and co-production arrangements. Local [Healthwatch](#) teams should also be considered.
- People affected by, and at risk of, stroke should be represented in the governance arrangements of ISDNs from the outset, and there should be [partnership with people affected by stroke](#) at all levels of the local system.
- Further support is available from the FutureNHS site for [co-production and public engagement](#).

ISDN establishment

Every ISDN should by April 2021:

Timeline: August 2020 – November 2020	
1.	<p>Agreement</p> <p>Having jointly signed off terms of reference (see ISDN structure and governance)</p> <p>confirm ISDN boundaries with cross-boundary issues identified with mitigating actions</p>
2.	<p>Funding</p> <p>Confirm funding and hosting arrangements for employment of relevant staff</p>
3.	<p>Mobilising</p> <p>Operationalising teams, which includes agreeing hosting arrangements for core ISDN staff in line with an agreed network management structure, to include at least:</p> <ul style="list-style-type: none"> • A clinical director to provide the clinical leadership (this may be shared clinical leadership between medical, nursing, therapy leads) • An ISDN manager and administration support <p>Have access to a support team including data analytics and administration</p>
4.	<p>Governance</p> <p>Embedding robust governance at a regional level</p>

	Have clinical and/or managerial, patient, and carer representation from key/nominated stakeholders through the entire patient pathway from acute care, to rehabilitation and ongoing care, and prevention
5.	Flow Establishing links with neighbouring ISDNs to manage any cross-boundary flows Have agreed plans to develop clear patient pathways including for pre-hospital assessment, thrombectomy, stroke unit care, and early supported discharge, into community and social care and into voluntary sector support; building on current service provision.
6.	Links Establishing links to all other relevant networks including regional GIRFT Implementation hubs, Primary Care Networks, Academic Health Science Networks, Strategic Clinical Networks and Senates and into voluntary sector links.
December 2020 – March 2021	
7.	Priorities Having agreed priorities that focus on delivery of the stroke components of the Long Term Plan and improving outcomes for stroke patients across all aspects of care, from prevention through to life after stroke and end of life care.
8.	Operation Having an operational plan to develop clear patient pathways including pre-hospital assessment, thrombectomy, stroke unit care, and early supported discharge, into community and social care and voluntary sector support building on current service provisions.

Integrated Stroke Delivery Network Specification

Part 2: ISDN Pathway Specification

Introduction

This section outlines what we understand to be best practice for the NHS, reflecting a recently commissioned evidence review from Kings College London and examples of excellence witnessed by the GIRFT stroke programme, and presents clear ambitions for every area of the country to develop and implement as part of their strategic delivery of the Long Term Plan for the NHS.

Many ISDNs will already be achieving against much of the specification below, which outlines best practice in caring for adult (over 16 years) stroke patients. This network specification defines the optimal pathway for a new era of joined-up stroke care enabled by technology and supporting the delivery of personalised care throughout every patient journey. It highlights the importance of pre-hospital, post-acute and longer term care, as well as the need for urgent care pathways to support the delivery of increased access to thrombolysis and thrombectomy.

Following extensive consultation with stroke survivors and stroke specialists the nomenclature for stroke units is proposed to change to: Comprehensive Stroke Centre (CSC) - hyper acute, acute and inpatient rehabilitation including thrombectomy and neurosurgery, Acute Stroke Centre (ACS) - hyper acute, acute and inpatient rehabilitation but excluding thrombectomy and neurosurgery; and Stroke Recovery Unit (SRU) - acute and inpatient rehabilitation only.

While no ISDN is expected to be able to deliver all of the elements outlined below straight away, delivery of this optimal pathway within the period of the NHS Long Term Plan, ensuring our patients benefit from world class care, should become the key deliverables for each stroke network.

1 Prevention

Stroke prevention is achieved primarily in the community: both targeting the high-risk general population (primary prevention) including those specifically at higher risk

through social inequalities, and those discharged following a stroke or TIA (secondary prevention). It is however the responsibility of the ISDN and all health care practitioners involved in stroke care to ensure that secondary prevention is considered, risk factors screened for and patients offered intervention at every opportunity and with regular follow up.

There should be a clear focus on communication with patients, their relatives or carers, General Practitioners, others involved in their care, to ensure patient ownership of decisions related to them. There should be clear acknowledgement of patients' differing health beliefs and needs, with attention paid to those from the seldom heard groups and with communication difficulties. Patient understanding of and adherence to prevention should be everyone's responsibility.

Through treating key risk factors including hypertension, hypercholesterolaemia, atrial fibrillation, poor diet, obesity, smoking and lack of physical exercise, as much as 90% of stroke disease may be preventable. The use of innovative strategies and technologies to detect and address adherence of both modifiable physical and social economic risk factors for stroke should be encouraged. It is important to recognise the impact of health inequalities and digital inequalities when managing high risk groups.

What do local stroke systems need to do? ISDNs working with local Primary Care Networks to:

- Support introduction of the CVDPREVENT audit from Summer 2021, and respond to SSNAP indicator F6 (unmedicated known AF)
- Support the implementation of the community pharmacy contract and involving local voluntary sector partners to provide opportunities for the public to check on their health through readily accessible screening for hypertension, with a focus on people from deprived and disadvantaged groups.
- Ensure that primary and secondary care teams are adhering to the 140/90 blood pressure NICE guidance¹
- Be aware of PCN test bed programmes to increase diagnosis and detection of high-risk conditions

- Work with community pharmacists, GP practices and voluntary sector partners such as the British Heart Foundation and the Stroke Association, to raise awareness of stroke and its symptoms, and risk prevention
- Support uptake of the NHS Health Check and work on risk factor management, e.g. smoking, weight and alcohol services
- Support delivery of the [NHS Long Term Plan](#) and [PHE CVD Ambitions](#) around the three high risk conditions – AF, high blood pressure and high cholesterol

1 Pre-hospital phase

Aims and objectives of service

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. Refreshed public awareness raising around common stroke symptoms can also enable earlier better-informed 999 calls.

SERVICE OUTCOMES

Clinical assessment by pre-hospital staff:

- If within 20 hours of onset², suspected stroke cases should be assigned "category 2" 999 response and meet category 2 ambulance service standards – two-person response with the ability to transport patient. If symptoms exceed 20 hours this may change the response time required for some patients. Local systems will need to determine the resource implications of this change to determine deliverability.
- Patients with suspected acute stroke must be screened using a validated tool and transferred, if appropriate (including cases where stroke is suspected by ambulance service staff despite a negative screening result) to an acute or comprehensive stroke centre.
 - Pre-hospital triage supported by telemedicine linked to a senior stroke clinician should be considered to allow for early identification of possible thrombolysis or thrombectomy patients, with the option to convey directly to a comprehensive stroke centre for possible thrombectomy in appropriate circumstances only.
 - For a selected cohort of patients with unclear diagnosis, 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.

² In line with NICE 128 2019 guidance regarding access to IAT < 24 hrs from symptom on set

- All suspected stroke patients should be assessed and managed in accordance with best clinical practice and monitored for Atrial Fibrillation and other dysrhythmias en route but without delay to transport).
- Action plans should be agreed to improve ambulance response and reduce on-scene times.

Ambulance conveyance to hospital:

- All patients with suspected acute stroke, should be immediately transferred by ambulance to an Acute or Comprehensive Stroke Centre (ASC or CSC). There will be occasions when this is not appropriate but only following detailed discussions with an ACS or CSC.
- 999 call to hospital door time should be as short as possible, to minimise time to treatment.
- For patients with ischaemic stroke, systems should achieve a 90th centile call to needle time of 180 minutes.
- Pathways must be put in place to select the most appropriate ASC or CSC, supported via technology such as 'apps' or telemedicine where appropriate, to underpin agreed pathways, maintaining sustainable admission levels to ASC or CSC. Both low-cost technologies and more bespoke products may be used to provide this.
 - Clear local arrangements must be in place to enable pre-hospital clinicians to locate the closest available ASC or CSC, at any time.

A system of pre-alert must be available, with appropriate communication of patient characteristics, enabling all patients within intervention windows to be met by the stroke team on arrival at the ASC or CSC

Intra-hospital transfers:

- Intra-hospital transfer for thrombectomy should be at least treated as a category 2 call or time-critical transfer where a new ambulance is needed, via standing arrangement with ambulance providers.
- Systems should develop pathways, including pre-notification of arrival, such that urgent stroke imaging, interpretation and transfer decisions can be completed in a sufficient timescale, ideally within 20 mins of arrival to allow the possibility of the initial ambulance team continuing to transfer viable thrombectomy patients onward from an ASC to a CSC.

2 Hyper-acute stroke care

Hyper-acute stroke services provide expert specialist clinical assessment, rapid multi-modal brain imaging and the ability to deliver intravenous thrombolysis 24/7 transfer or treatment for thrombectomy. Hyper-acute care typically cover the first 72 hours after admission. These services must be provided in an ASC or CSC which provides hyperacute and acute care 24/7. ASC and CSC must care for a volume of patients as to make the service clinically sustainable, maintaining workforce expertise and ensuring good clinical outcomes. Every patient with acute stroke should gain rapid access to a stroke unit (<4hrs) and receive an early multidisciplinary assessment.

Service Outcomes

All service outcomes detailed under Acute Care are also applicable to Hyperacute Care unless stated below.

Clinical assessment:

All patients (including self/GP/ ambulance referrals) with suspected stroke are to be admitted to a hospital with an ASC or CSC service and seen by a stroke team to receive immediate, structured assessment by appropriately trained staff in a consultant-led team to determine diagnosis and suitability for thrombolysis, thrombectomy, rehabilitation and ongoing care needs.

- All patients with suspected acute stroke to receive the most appropriate brain imaging and interpretation as soon as possible and within 60 mins of arrival, with immediate networked arrangements for image sharing and review by relevant specialists.

On diagnosis of stroke:

All patients presenting with acute stroke should be treated as the highest priority of medical emergency with emergency protocols in place. To ensure optimised treatment, all patients must be admitted directly to a stroke unit and receive early multidisciplinary assessment to include at least stroke specialist nursing input, stroke specialist medical input, and swallow screening within 4 hours..

- All patients to be seen by a stroke specialist clinician within 60 mins of arrival
- Assessment by all specialist therapists (physiotherapist, occupational therapist, speech and language therapist) within 24 hours of admission

Thrombolysis

Intravenous thrombolysis should be provided 24/7 to stroke patients who are deemed suitable for thrombolysis with an appropriate protocol in place to screen patients against the medical criteria for thrombolysis:

- Appropriate stroke patients to be scanned, assessed by a stroke specialist and if appropriate receive thrombolysis, ideally within 20 mins and at least within 60 mins of admission (door to needle time).
- Access should be available 24/7 to perfusion brain imaging (CTP or MRP) with rapid interpretation to support decision making, supported by AI and off-site expertise where appropriate.
- Thrombolysis should be provided to all appropriate patients, with up to 20% of stroke admissions amenable across the ISDN. (z.2)

Thrombectomy:

Thrombectomy must be provided *as soon as possible* to all appropriate patients in line with NICE guidance to maximise benefit to patient outcomes. 24/7 emergency intra-hospital thrombectomy transfer pathways must be in place for all Acute Stroke Centres. Repatriation flows must also be established, agreed and supported by the whole system.

- All potential thrombectomy patients should have CT Angiogram included with

initial brain scan; with initial image interpretation for thrombectomy referral completed by the referring team, supported by AI and off-site expertise as required.

- Thrombectomy should be provided to all appropriate patients, with up to 10% of stroke admissions amenable across the ISDN.

Intracerebral Hemorrhage (ICH):

The rapid medical management of ICH must be available 24/7, with evidence-based interventions initiated within the first hour of reaching hospital:

- Reversal of anticoagulation therapy where appropriate
- Lowering of blood pressure in line with current guidance (ISDN annual review)
- Referral to neurosurgical centres for consideration of intervention, considering location and calculation of intracerebral volume - the routine referral of all patients should be avoided and clear protocols in line with current guidance (ISDN annual review) should be in place
- Consideration of referral to intensive therapy units to support cardiorespiratory and renal systems whilst definitive treatment plan is finalised.
- Consideration of end of life care where appropriate, for example, in the case of a catastrophic event.

Regular neurological observations and access to repeat brain imaging within an hour of any further deterioration delivered 24/7.

Monitoring & Mobilisation:

Protocols must be in place to ensure appropriate monitoring of all patients by stroke-trained staff in the entire hyper-acute phase, and for at least 24 hours. This includes daily senior stroke specialist medical ward rounds.

Early mobilisation must only be offered within 24 hours to patients who require only minimal support to mobilise³.

Exclusion criteria

While all patients should be offered emergency assessment and scanning, with due consideration of recurrent stroke risk and benefit of hyper acute stroke care, those > 24hrs post onset of symptoms may benefit less from some elements of hyper-acute care.

Access to and interdependence with other services/providers

Hyper-acute services must have onsite access to the following support services and clinical interpretation:

- Brain imaging (CT and MRI), with patients scanned urgently in the next scan slot (ideally within 20mins), and within a maximum of 60 minutes with skilled interpretation available 24/7, supported where necessary and appropriate by Artificial Intelligence (AI).
- Vessel imaging e.g CTA, should be considered in line with symptoms and ideally

³ Ref AVERT trail

as part of the first brain scan upon admission where thrombectomy is a potential intervention. All other patients where clinically appropriate should be able to access vessel imaging within 24hrs of admission, alternatives being ultrasound of the carotids or MRA.

Specialist neurosurgical and vascular procedures are sometimes necessary to prevent further damage following a stroke, or to prevent secondary stroke recurrence. Effective and timely referrals are necessary to ensure that patients suffering a stroke receive the most appropriate care. Networks must ensure that there is immediate availability of images, to relevant providers of these services.

Neurosurgical services must be provided as early as possible where appropriate, with rapid recognition of the need for surgical intervention. All patients with a suspected non-disabling stroke or TIA must have urgent access to neurovascular surgical services including:

Vascular surgical services:

- Carotid intervention (e.g. carotid endarterectomy) for recently symptomatic significant carotid stenosis, using validated criteria should be regarded as an urgent procedure and be performed within seven days of symptom onset, where neurologically stable and where clinically appropriate.
- Patients with a non-disabling stroke or TIA, that require carotid endarterectomy should be admitted for urgent investigation and surgery within 48 hours of diagnosis.
- Access to tertiary services on-site or off-site. For off-site services, clear protocols must be in place for a commissioned pathway of care.

Neuro surgical services:

There are relatively few indications for neurosurgical intervention in patients with stroke, however, some specific stroke patients may require urgent management. In particular, arrangements for the monitoring and transfer of patients with intracerebral haemorrhage and of those at risk of malignant middle cerebral artery syndrome should be in place across the ISDN and delivered in line with current national guidelines (ISDN annual review).

3 Acute stroke care

Acute stroke care immediately follows the hyper-acute phase, usually after the first 72 hours from admission. Acute stroke care services provide continuous specialist input, with daily multidisciplinary care, continued access to stroke trained consultant care, access to physiological monitoring and access to urgent imaging as required. These services should be provided by a Stroke Recovery Centre, or within an Acute or Comprehensive Stroke Centre.

Service Outcomes

All stroke patients should have access to high-quality stroke care and spend the majority of their time in hospital under specialist stroke care with access to:

- Early and regular communication with patients and their nominated relative or carer, to include diagnosis, interventions, prognosis and transfer of care plans.
- Stroke inpatient rehabilitation as per section 5a
- Stroke trained nursing at all times
- Daily senior decision making capable ward rounds at consultant or equivalent level at least five days a week, and within 24 hours of repatriation or admission to a new unit or team
- Protocols for timely receiving and discharging of patients seven days a week
- A stroke trained MDT available seven days a week
- A venous thrombo-embolism risk assessment with appropriate prescription and administration of Intermittent Pneumatic Compression where justified in accordance with NICE recommendations and regular review of vte risk and management based on changes in mobility and time since stroke event, using a stroke specific decision support aid
- Assessment or treatment by all appropriate specialist therapists (physiotherapist, occupational therapist, speech and language therapist) within 24hrs of admission and others (e.g. dietician, orthoptist) within 72 hrs
- Protocols for the promotion of bladder and bowel continence including a policy to avoid use of urinary catheters and a policy for prevention of pressure sores
- Stroke survivors with continued loss of bladder control two weeks after diagnosis are to be reassessed and to jointly agree an ongoing treatment plan by week three involving both patients and carers
- Comprehensive secondary prevention advice and treatment must be provided to all with interventions to improve adherence and persistence with medication and life style modification.
- A dysphagia management service must be available including best interest meetings where appropriate and access to services to insert a gastrostomy tube where indicated within 72 hrs of decision.
- A formal discharge summary report must be shared with the referrer, GP and stroke survivor, with named person to contact (if requested) on the day of transfer of care.
- Ensure a 6/52 follow up is arranged, which may for the majority of patients not need to be from a medically qualified individual, but must include the capability to confirm the diagnosis, interventions received, prognosis, secondary prevention investigations undertaken and measures instituted along with medication adherence and understanding of condition along with patient reported outcomes (PROMS).

Access to and interdependence with other services/providers

Acute stroke services must have agreed access (*not necessarily onsite) via clear protocols to the following support services and clinical interpretation:

- Brain imaging (MRI and CT, onsite)
- Carotid imaging (including ultrasound/MRA/ CTA)

- *Thrombectomy
- *Neuro surgery
- *Vascular surgery for carotid endarterectomy as per section 2.

4 TIA Services

TIA services should provide a full and rapid diagnostic assessment urgently, without risk stratification, and within 24hrs 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 1week or sign posted to more appropriate clinics.

Vessel and brain imaging should be on the same day as the assessment as required; using MRI preferentially for brain imaging, as per NICE guidance.

Service Outcomes

Referrers should discontinue the practice of triaging patients according to risk stratification tools e.g. ABCD2 and ensure that all patients with suspected TIA are assessed, diagnosed and treated urgently, and within 24 hours of initial contact, via a 365-day service.

- Patients with non-disabling stroke or TIA should receive treatment for secondary prevention in line with best practice (ISDN annual review), as soon as the diagnosis is confirmed.
- Some people who have had a TIA may have care and support needs beyond secondary prevention; it is the responsibility of a TIA service to support people to access any care/support/information/advice they require.

Acceptance and exclusion criteria and thresholds

- Patients with suspected TIA that occurred more than a week previously should be assessed by a specialist clinician as soon as possible and at least within seven days

Access to and interdependence with other services and providers:

- Blood tests & ECG
- Brain scan (if vascular territory or pathology uncertain) - MRI and not CT.
- Prompt provision of evidence-based secondary prevention treatments for all known risk factors that have an evidence based intervention
- Management of hypertension and atrial fibrillation
- Written information and advice regarding stroke risk, secondary prevention with driving / flying / activity preclusion advice
- Carotid imaging with access on same day as assessment where indicated, with carotid intervention undertaken within 48hrs of diagnosis and within seven days of symptom onset.

What do local stroke systems need to do?

- Ensure that ISDN development and STP/ICS strategic plans include maximisation of patient care and system sustainability via service transformation and establishment of optimal stroke pathways; drawing on the evidence base, health outcomes tool, GIRFT and [British Association of Stroke Physicians \(BASP\)](#) joint workforce tool, as well as local and national intelligence (2019-20)
- Engage closely with ambulance providers to ensure robust transfer pathways are developed and prioritised, including category 2 intra-hospital transfers for potential thrombectomy patients (2020-21)
- Ensure ambulance service training and operational capacity for stroke is prioritised with any proposed service transformations (2020-onward)
- Ensure TIA and stroke 'mimic' activity, including neurology patient flow, is considered within all service modelling, development and transformation (2020-onward)
- Consider the potential for STP capital funds to support service transformations at a system level (2020-onward)
- Ensure that technology and pricing are considered within short and medium-term service developments. (2020-onward)
- If system transformation is likely to require large-scale service change, consider the NHS '[Planning, assuring and delivering service change for patients](#)' guidance, which is designed to be used by those considering, and involved in, substantial service change to navigate a clear path from inception to implementation. It will support commissioners and providers to consider how to take forward their proposals, including effective public involvement, enabling them to reach robust decisions in the best interests of their patients
- The FutureNHS support site for [system transformation](#) features key contacts, learning from peers and national experts, tools and case studies, a discussion forum and links to further resources to help your local schemes achieve success
- A FutureNHS support site is also available for co-production and [public engagement](#)
- Where changes stretch across multiple local authority areas, as is likely for ISDNs covering multiple STP/ICS areas, and early work suggests there will be significant changes to service delivery, consider whether there is a need or benefit from establishing Joint Health Overview and Scrutiny arrangements at an appropriate time as plans are developed
- Ensure strategic planning and transformation takes due account of health inequalities including via [modelling](#), as appropriate.

5 Rehabilitation

Following a stroke, people should have timely access to high quality rehabilitation appropriate to their need and their desired outcomes. The multidisciplinary team must work 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. Inpatient, integrated ESD and community rehabilitation services should be fully joined up and should each include a wide range of expertise including:

- physiotherapy
- occupational therapy

- speech and language therapy
- vocational services
- psychological services
- access to any other specialist clinical services required, including orthoptics and dietetics
- life after stroke services (see 6).

These services should be provided consistently and to a high standard of specialist care throughout the stroke survivor's recovery, starting from the point of early initial assessment and seeking to achieve maximum gain for both clinical and personalised goal outcomes across the stroke pathway. The full patient pathway is to be actively performance monitored across all areas of rehabilitation provision, ensuring intensity of rehabilitation throughout each phase of care is appropriate, and at least in line with NICE, National Clinical Guideline, and SSNAP standards. The 'Service Outcomes' emphasised below for each element of rehabilitation each build on this core specialist provision and underline the key principles of a well integrated and networked service.

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 world class service to all patients, communities and backgrounds.

5a Inpatient rehabilitation

Inpatient rehabilitation is an essential bridge for many stroke survivors between acute stroke care and post discharge integrated community rehabilitation. The key outputs for this service overlap with the sections on Acute Stroke Care, Community Rehabilitation and Life After Stroke. These services should be provided by a Stroke Recovery Unit, or within an Acute/Comprehensive Stroke Centre and should be commissioned as part of an integrated whole pathway approach.

Service Outcomes

Rapid multidisciplinary assessment and personalised planning

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 seven-day service

High quality therapy should be offered seven days a week to all patients and by all required core clinical disciplines, at an appropriate intensity to meet each individual's rehabilitation goals.

Focus on patient and carer empowerment

Patients will receive patient centred care, empowerment and facilitation of supported self-management, enabling meaningful participation in daily life after stroke.

Seamless transfer of care

Pathways networked with community, social care and voluntary sector services will ensure safe, effective and efficient transfers, minimising inpatient length of stay and readmission rates.

Acceptance and exclusion criteria and thresholds

All patients with rehabilitation goals specifically related to their stroke which cannot be met within the community to the same intensity will be eligible for inpatient rehabilitation.

Patients receiving palliative and end of life care should also be considered eligible for inpatient rehabilitation, including access to therapy and specialist services where appropriate. This should be assessed and discussed on an individual basis and recorded in a personalised care and support plan.

Access to and interdependence with other services/providers

In addition to the core service provision and cross-sector seamless access outlined in section 5, protocols for access must be in place for: orthotics, podiatry and social work services.

5b Early Supported Discharge and Integrated Community Stroke Service Rehabilitation

Early Supported Discharge (ESD) must be provided to facilitate early transfer of care to a community setting, continuing rehabilitation at the same level of intensity and expertise that would have been received in the inpatient setting^{viii}.

ESD should be provided within an **Integrated Community Stroke Service (ICSS)** which joins up inpatient, ESD and community provision, coordinates transfers of care from hospital and provides all specialist stroke rehabilitation in the community, beginning with ESD.

The ICSS must be able to deliver all stroke specialist care at appropriate intensity across the pathway and have appropriate knowledge, competencies and experience of specialised stroke care. The ICSS will ensure that all stroke patients are seamlessly seen in a timely way by a single multi-disciplinary team, regardless of their disability or destination, and will ensure parity of provision for physical and psychological rehabilitation and goals.

Service Outcomes

Consistent provision and transitions

Through a stroke specialist, multidisciplinary team structure, the ICSS will ensure that all stroke patients receive effective post-acute rehabilitation, available 7 days a week based on their level of need.

Appropriate level of intensity for all patients

Patients with stroke who have mild to moderate disability and who have been identified as being eligible for ESD should be offered assessment and treatment in the community within 24 hours. Stroke rehabilitation should be offered at the same intensity as stroke unit care (typically daily sessions) and be based on clinical need tailored to personalised goals and outcomes.

Patients deemed not requiring ESD intensity should be assessed within 72 hours and provided treatment within 7 days of assessment or earlier, based on clinical judgement and patient choice. The intensity of intervention provided to non-ESD patients is typically less than is offered to ESD patients, however intensity of provision must be established between stroke specialist, survivor and carer, based on clinical need and tailored to personalised goals.

The duration of ESD/ICSS input should be needs related and not time limited.

Specialist rehabilitation meeting personalised goals

Therapy should be available to all patients for a minimum of 6 months from admission to the service, with extensions offered in line with clinical judgement, and the option of re-referral back into the service at the end of the period, or later, where required to achieve personalised goals.

- **Pathway 1:** Home with ICSS input. These are patients able to manage activities of daily living, independently or with a carer, and includes both ESD and non-ESD patients.
- **Pathway 2:** Home with ICSS combined with daily social care support. Patients discharged home with social care support of up to four times a day for six weeks (such as a re-enablement service) combined with ICSS to enable safe management and rehabilitation at home. A joint rehabilitation management plan with social care should be put in place following the initial assessment at home within 24 hours of discharge.
- **Pathway 3:** Discharged to a residential/nursing home. All people with stroke discharged to a care home should receive an assessment and treatment from stroke rehabilitation services in the same way as patients living in their own home. Patients discharged to a nursing or residential home will be visited by the ICSS for assessment within 72 hours of hospital discharge based on clinical reasoning and patient need/choice. Care home staff should have training on the physical, psychological and social effects of stroke and optimum management of common impairments/disabilities.
- **Other care facilities:** There may be a small number of patients who are transferred to other care facilities (such as intermediate or transitional care) with support from the ICSS.

Acceptance and exclusion criteria and thresholds

ESD / ICSS rehabilitation is suitable for stroke survivors with mild to moderate disabilities. The stroke inpatient team, in collaboration with members of the ICSS, will assess eligibility for community based rehabilitation informed by eligibility criteria together with clinical judgment, patient and carer input.

Referrals to ICSS will be accepted if the person is:

- Over 18 years old, with exceptions where the patient is 16 years or older whose needs have been identified as being best met by the ICSS.
- Primary diagnosis of stroke or presumed stroke (those awaiting diagnosis may be eligible)
- The patient must be medically stable with appropriate medical investigations completed or planned with future medical review in place.
- For patients discharged alone to a private address they must be able to maintain their own safety independently (including ability to mobilise independently).
- If a patient is readmitted to hospital, specialist stroke therapy should continue as clinically indicated and the patient should not be precluded from further timely and ongoing community based therapy as required.

Exclusion criteria

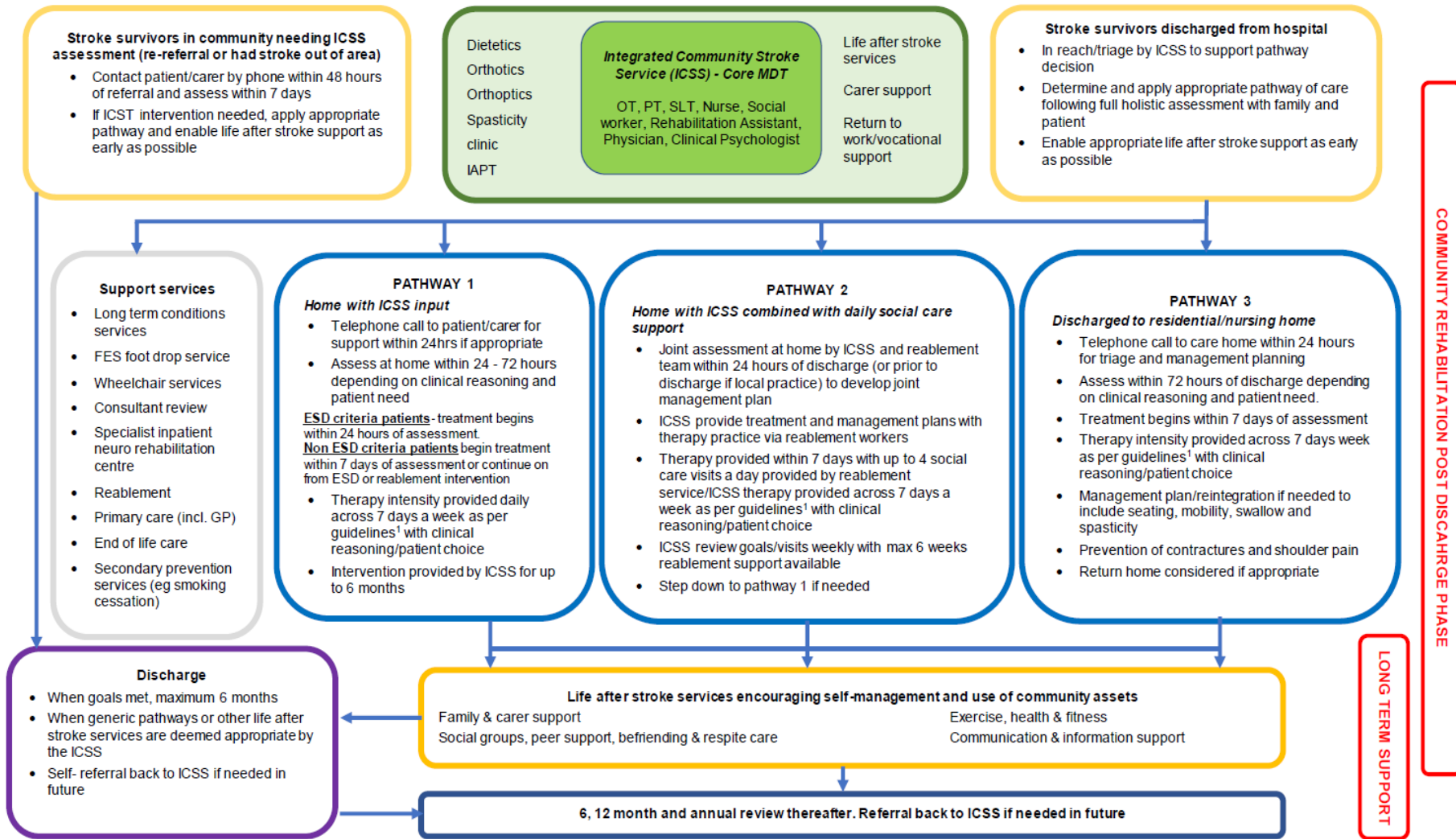
- Patients cannot be discharged to the ICSS until necessary care, equipment and transport are in place which should be organised collaboratively and with the patient and carer(s).
- If any patients are deemed not appropriate for intervention by the ICSS, the team will provide advice and support to sign post to the most appropriate service.
- When related to neuropsychological difficulties poor engagement is *not* an exclusion criteria.

Interdependence with other services/providers

The ICSS must work in partnership with hospital teams, GPs, primary, secondary, voluntary and social care services to provide holistic and seamlessly networked patient and carer support.

The service must develop appropriate referral pathways with other relevant statutory and non-statutory providers within the health local economy, especially those offering support for life after stroke e.g. voluntary sector.

Integrated Community Stroke Service (ICSS)



¹ Guidelines are for ESD criteria patients' therapy in line with NICE guideline. For all other patients, use community pathway requirements. Active therapy (OT, PT and SLT and access to other specialist as required) = measure of intensity of delivery at 3 x week; or 1 x week for input of each active therapy.

5c Psychological rehabilitation and support

Psychological and neuropsychological rehabilitation must be routinely available as part of core service provision throughout the patient journey, with all staff having an important role to play. The full multidisciplinary team must address the burden of psychological, emotional, cognitive and neuropsychological effects commonly experienced by stroke survivors, which can greatly impact rehabilitation engagement, function, return to work and ultimately quality of life.

An integrated and multidisciplinary care approach should be adopted – psychological approach and interventions should be integrated throughout care planning, with collaboration across clinicians and providers on the patient pathway. When required, specialist assessments should be sought from psychology services with appropriate interventions provided to meet needs and personalised goals, supporting the best possible patient experience and outcomes.

Service Outputs

Consistent consideration of psychological needs throughout rehabilitation

High quality psychological screening, assessment and personalised interventions will be offered and tailored appropriately for all levels of need throughout the full patient pathway. This applies to all staff and all patient contact and includes routinely monitoring changes in cognition, behavior and emotional state, mental health and associated mood disorders.

Specialist psychologists will be part of the stroke team

Establishing clinical psychologists or clinical neuropsychologists, with stroke expertise, as core members of the stroke team will enhance rehabilitation outcomes and patient experience. Access to senior decision maker support and guidance, as well as interventions, will empower the multi-disciplinary team (MDT) to provide seamless psychological support to patients throughout their rehabilitation.

Psychological interventions will be measured for success

When specialist intervention is required, standardised outcome measures should be used to measure the impact of interventions and patient experience across the pathway

Acceptance and exclusion criteria and thresholds

- Acceptance and exclusion criteria are as per 5b – provision must be accessible to all ICSS patients.
- Psychological support to partners and family members of stroke survivors should also be considered routinely; recognising both their needs and the support system that their social and familial relationships provide to support stroke recovery.

Access to and interdependence with other services/providers

Psychological care and rehabilitation will require:

- Accessible clinical psychology or clinical neuropsychology services, with stroke expertise, alongside wider, step-down emotional and psychological support pathways for all patients
- Clinical Psychologists/ clinical neuropsychologists (with stroke expertise) to provide training and clinical supervision to wider psychological and emotional support service providers (e.g IAPT therapist workforces, counsellors and peer support workers in the Third sector), who provide services to stroke patients

5d Vocational rehabilitation

Vocational rehabilitation (VR) is defined as “a process to overcome the barriers an individual faces as a result of injury, illness or impairment when accessing, remaining in or returning to purposeful activity, work and employment”^{ix}. Consistent provision is key both to improving patient experience and outcomes, and to confronting the linked socioeconomic inequalities. All clinicians and all services across the ISDN should collaborate to ensure best practice provision.

Service description/care pathway

Stroke vocational rehabilitation should be delivered as an ageless service and as an integral part of the pathway at all stages from acute to community, promoting awareness of the impact of meaningful work for health and wellbeing. This should be offered in a tiered model as follows:

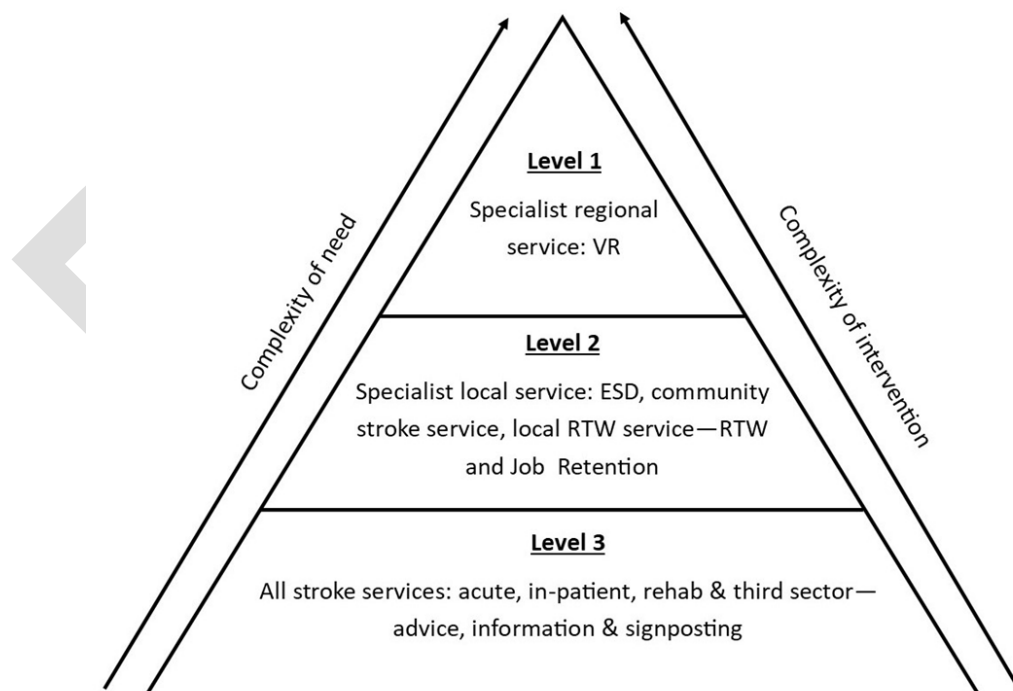


Figure 1.

This model represents a dynamic pathway: the stroke survivor may move across the levels in a non-linear way, dependent on their changing needs and circumstances. It

is important that services are sufficiently flexible to be able to respond to increasing/decreasing levels of need in a timely and responsive way.

Acceptance and exclusion criteria and thresholds

Level 3 (Advice and sign posting on return to work)

All stroke survivors, regardless of age, should be considered for and offered appropriate, advice, sign-posting and referral for more support to return to work.

Level 2 (Return to Work Service)

Stroke survivors who were working prior to their stroke, who have a job to return to and who want/need support to return to this work, or advice on alternative options (i.e. redeployment, medical retirement etc.) A return to work plan should be implemented within 6 months.

Level 1 (Specialist Vocational Rehabilitation)

Any stroke survivor with a disability that is preventing return to work and/or the return to work plan will take longer than 6 months to implement (e.g. current abilities do not meet the needs of their present position, need additional support/advice on looking for suitable alternative employment or patient was not in work prior to stroke and needs additional support to find work, employer is not supportive of return to work plans, environment cannot be adapted, etc)

Access to and interdependence with other services/providers

Vocational specific rehabilitation may, with consent, require support from services such as:

- Employer
- Occupational Health
- Access to work
- Job Centre
- Volunteer bureau
- Trade Union Representative/ACAS

What do local stroke systems need to do?

- Ensure that in-patient stroke rehabilitation meets national standards for all eligible patients.
- Ensure that all stroke survivors are appropriately offered a comprehensive holistic six-month post stroke review from 2020 onwards which is documented on SSNAP.
- Use data from six-month reviews to inform local needs mapping, workforce and service improvement planning for 2021 and subsequent years
- Develop robust systems for transfer of care, when needed, from stroke specialist services to generic rehabilitation when specialist rehabilitation no longer required, and care services including voluntary sector support.

- Ensure that generic services are provided with training about stroke care and how to access specialist support (April 2021)
- Develop a local knowledge offering for stroke patients supporting engagement and access to long term rehabilitation for stroke survivors including self-management, vocational support, psychological support, social prescribing – drawing on national tools such as [My Stroke Guide \(by April 2021\)](#)
- Ensure all commissioned services submit data via SSNAP for quality improvement
- If not already underway, a review of services leading to a service model that supports integrated community rehabilitation services for all stroke survivors covering the full geography (November 2020). A specification for an integrated community rehabilitation service including ESD and discharge to residential care or nursing care is available on FutureNHS
- Work with local partners across the health, social and voluntary sectors to ensure that the right support is available for stroke survivors for as long as is required

6 Life after Stroke

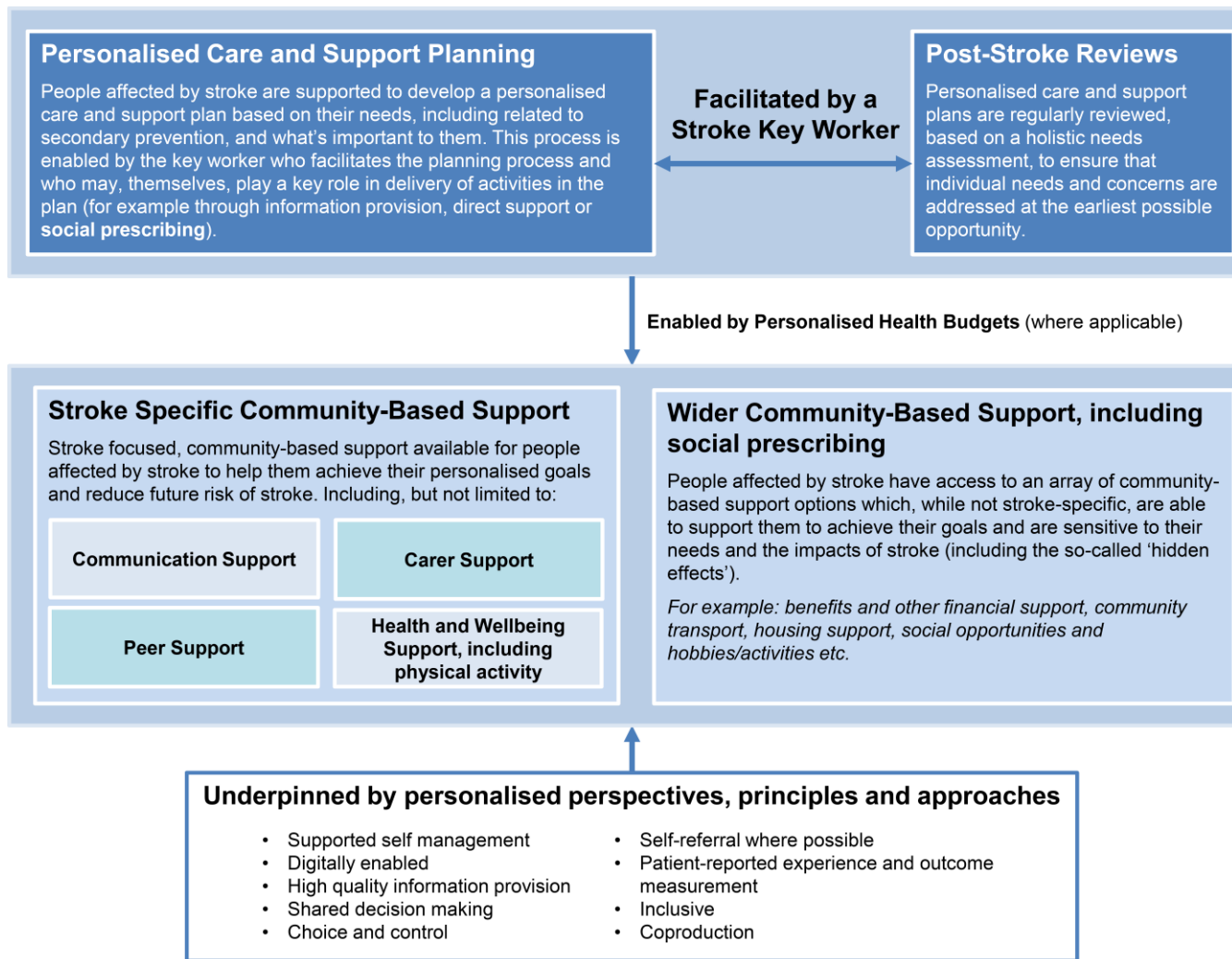
Life after stroke services provide the essential ongoing personalised care and support people need to rebuild their lives and minimise their risk of further cardiovascular events. They provide support for long-term needs through timely access to information and community-based support, and ensure people are enabled to manage their condition(s) as independently as possible and improve their health and wellbeing.

Service description/care pathway:

Life after Stroke (LaS) services should be made available and accessible to all people affected by stroke from the very acute phase onwards, and may continue to be accessed by people long after their stroke, acknowledging that their needs, circumstances and what is important to them can change significantly over time. LaS services should integrate with the ICSS to ensure optimal multidisciplinary coordination of an individual's care and support. The key components of LaS services are:

- Stroke key workers
- Personalised care and support planning
- Post-stroke reviews
- Stroke-specific, community-based support including:
 - Communication support
 - Carer support
 - Peer support
 - Health and wellbeing support
- Wider community-based support, including social prescribing.

People affected by stroke should be referred to a stroke Key Worker service by their discharging inpatient stroke team to ensure they can access appropriate personalised support. Key workers may support people, but more intensive, local face-to-face key worker support should always be available for those who need it, such as those with more complex needs or severe communication difficulties.



Acceptance and exclusion criteria and thresholds:

All people affected by stroke should have access to a key worker, with the mode and intensity of input provided being proportionate and responsive to their needs. This includes people who have not required / opted-out of access to rehabilitation services for any reason, as well as carers and family members.

The requirement for other LaS service components will be defined by a person's personalised care and support plan, but should be underpinned by the principle that it should be available to those who need it, when, where, how and for as long as they need it.

Interdependence with other services/providers:

Integration with other providers in the stroke pathway is critical to the success of LaS services. Key workers providing support locally should be considered core members of the ICSS, and relationships and care coordination should be supported through their attendance of MDT meetings.

In addition to the components listed above, key service relationships and partnerships for LaS services may include:

- Primary care networks, GPs and primary care staff
- Generic social prescribing services and link workers
- Therapy services including physiotherapy and speech and language therapy
- NHS community services, including: memory clinics, pain clinics, falls services, continence services, IAPT services, health promotion services.
- Social care providers
- Leisure providers
- Care and residential homes
- Independent, voluntary and charitable sector organisations, providing community-based support.
- Equipment (aids and adaptations) providers
- Clinical Commissioning Groups.

What do local stroke systems need to do?

- Review local service provision against the key components of a quality life after stroke service, and the upcoming 'life after stroke' full service specification, identifying gaps in provision and making recommendations for service planning and investment across the geography.
- Ensure that all inpatient stroke teams refer stroke survivors (and their carers/family members as needed) to Life after Stroke support services.
- Ensure that all stroke survivors are appropriately offered a comprehensive holistic and person centred six-month post stroke review from 2019 onwards which is documented on SSNAP, (in line with the 2019-20 Commissioning for Quality and Innovation (CQUIN): Six month reviews for stroke survivors)
- Use data from six-month reviews to inform local needs mapping, workforce and service improvement planning for 2020 and subsequent years
- Ensure that generic services, including community-based support options, are provided with training about stroke care and support, and how to access specialist input (April 2021)
- Develop a local knowledge offering for stroke patients supporting engagement and access to long term rehabilitation for stroke survivors including self-management, vocational support, psychological support, social prescribing – drawing on national tools such as My Stroke Guide (by April 2021)

7 Workforce

Workforce planning should account for the skills and competencies required to provide services as outlined and in line with patient need. Allocation of professional roles for some aspects of this specification is indicative, based on the skills typically required. A local skills analysis should be conducted to assess the skills of 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.

Workforce planning and transformation tools, such as HEE's STAR tool should be used where necessary to support this. The GIRFT and British Association of Stroke Physicians (BASP) joint document on stroke medicine consultant workforce and the national Stroke Specific Education Framework ([SSEF](#)) also include staff planning and training tools. Further information relating to workforce modeling undertaken nationally will be available on FutureNHS.

As healthcare technologies advance and new technologies are introduced, the healthcare workforce will also evolve to support developments in patient care. This may mean the addition of new roles to support this specification, or variation in the staffing numbers required to deliver this service. Skills in relation to early diagnosis and management of high risk conditions for stroke (primarily atrial fibrillation, high blood pressure and cholesterol) should be promoted for all healthcare staff.

All staff will play an integral role in educating and training patients, carers and family members on the nature, implications and management of problems due to stroke, enabling them to effectively prepare for discharge from in-patient services.

It is expected that ISDNs will engage actively in workforce planning, with the needs of the local stroke services, contribute to regional plans and initiatives, including the development of novel, interdisciplinary and non-traditional roles, using a capability based model, to meet the needs of people with stroke.

What do local stroke systems need to do?

- Cross reference the local workforce mapping, making use of [the HEE STAR tool](#).
- Move to a capability based model of stroke delivered care.
- Apply the GIRFT and BASP Consultant Workforce model and apply to system planning in conjunction with SSEF workforce modelling, to optimise provision. Look to develop nursing and therapy advanced practitioner and consultant posts
- Use the Leadership Academy⁴ development offer to embed leadership from bottom up across the ISDN footprint to support service transformation
- Ensure inpatient and community multi-disciplinary teams include access to psychological, wellbeing and vocational rehabilitation/re-enablement support (November 2020)
- Consider opportunities for shared or co-located staffing across teams and specialisms to support ISDN systems development
- Ensure the local workforce plan incorporates specific stroke skills provision for registered and non-registered staff, both within specialist teams and supporting upskilling for non-specialist workforce, across both health and social care workforce
- Ensure all commissioned services submit data via SSNAP, including organisational audit data, capturing workforce snapshots

8 Data and Evaluation

- All ISDNs should contribute actively to the monitoring of service quality and performance along the entire stroke pathway, including the interpretation and dissemination of data from the national stroke audit SSNAP.
- All ISDNs should support their constituent services, both statutory and voluntary, in the process of quality improvement in response to national comparative audit.
- All ISDNs should report regularly to all stakeholders and the wider public on the quality and performance (both process and outcomes) of their stroke services.

Each ISDN should work with SSNAP to ensure effective oversight of the footprint. Regional and ISDN teams should currently use [SSNAP quarterly dashboards](#) to assure system performance, with a view to all elements of each service becoming 'A' rated. A colligate move to a more rapid reporting cycle with SSANP should be encouraged. Process scores within SSNAP should not be viewed in isolation but should be linked to outcomes, including recurrence rates, system cost and PROMs/PREMs.

[CVDPREVENT](#) should also be monitored to ensure an aligned focus on reducing incidence of stroke.

Within each ISDN footprint, thrombolysis and thrombectomy rates should [increase](#). Early Supported Discharge / ICSS rehabilitation should progress towards at least 40% of patients receiving this, and six month post-stroke reviews should be delivered to at least 60% of patients. Six month post-stroke review patient feedback, including patient outcomes and unmet needs, should then be harnessed to inform systems transformation and quality improvement.

2019-20 SSNAP data should be used for baselining all metrics.

To support the headline metrics shown here, a more detailed blueprint for development of further ISDN-level metrics (data dashboard) and trajectories will be co-designed with the new ISDN's. Local trajectories should be adjusted to local baselines, and in anticipation of step-change improvements following any networked service transformation. ISDN trajectories should be developed, in line with STP/ICS plans, by April 2021. This also includes the need to collect patient experience data across the whole pathway, with a focus on the role of the voluntary sector in helping to do so.

9 Delivering the NHS Long Term Plan

NHS Long Term Plan stroke milestones

We will prevent up to **150,000** heart attacks, stroke and dementia cases over the next 10 years

In 2019 we will work with the Royal Colleges to pilot a new credentialing programme for hospital consultants to be trained to offer **Mechanical Thrombectomy**

By 2020 we will begin improved integrated community **stroke rehabilitation models**, with full roll-out over the period of the Long Term Plan

By 2022 we will deliver a **ten-fold increase** in the proportion of patients who receive a thrombectomy after stroke so that 1,600 more people will be independent after their stroke each year

By 2025 we will have amongst the **best performance in Europe** for delivering thrombolysis to all patients who could benefit

Establishment of an ISDN and phased implementation of the pathways and quality standards will allow a well-integrated health and care system to demonstrate exemplary 21st century personalised care and deliver on a wide range of NHS Long Term Plan priorities including:

- People will get more control over their own health and more personalised care when they need it. (Chapter 3)
- Digitally-enabled care will go mainstream across the NHS (Empowering people, section 5.9)/
- Carers will benefit from greater recognition and support.(section 1.19)
- Grow investment in mental health services faster than the NHS budget overall for each of the next five years. (introduction and Chapter 3)
- Better care for major health conditions (Stroke).
- Social prescribing (section 1.40)
- LTP goal 1.8 in relation to the urgent community response and recovery support goals, specifically the element in relation to the delivery of reablement care within two days of referral to those patients who are judged to need it

Applicable NHS Long Term Plan goals

1- Areas that have centralised **hyper-acute stroke care** into a smaller number of well-equipped and staffed hospitals have seen significant benefit. This may mean a reduction in the number of stroke-receiving units, and an increase in the number of patients receiving high-quality specialist care. (LTP, p64)

2-ISDNs will support STPs and ICSs to optimize stroke pathways to enable sustainable and consistent delivery of specialist stroke centre care, improve the use of thrombolysis and further roll out mechanical thrombectomy. This will ensure 90 percent of **stroke patients receive care on a specialist stroke unit** and that all patients who could benefit from thrombolysis (possibly 20 percent) receive it, up from just over half of eligible patients now. (LTP, section 3.73 – 3.77)

Milestones for stroke care (LTP section 3.73 – 3.77)

- By 2022 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.
- By 2025 we will have amongst the best performance in Europe for delivering thrombolysis to all patients who could benefit.

3- LTP goal 3.77 regarding implementation and further development of higher intensity care models for stroke rehabilitation, with a commitment to more integrated and higher intensity rehabilitation for people recovering from stroke to six months and beyond.

4-The Life after Stroke services support delivery of the following elements of the NHS Long Term Plan, amongst others:

5-The NHS LTP states a commitment to more integrated and higher intensity rehabilitation for people recovering from stroke to six months *and beyond*.

Resources

Available supporting resources

- The [2019-20 Commissioning for Quality and Innovation \(CQUIN\): Six month reviews for stroke survivors](#). It incentivises increased delivery of six-month post-stroke reviews, supporting personalised pathways.
- The FutureNHS online stroke community of best practice – request to join via strokecommunity-manager@future.nhs.uk The site includes the ISDN structure and governance specification
- BASP/GIRFT [Consultant Workforce Guidance](#) published July 2019

- [NHS England- Stroke](#)
- [NHS Long Term Plan – Stroke](#)
- [NHS England. Practical guidance supporting the 2019-20 Commissioning for Quality and Innovation \(CQUIN\): Six month reviews for stroke \(April 2019\)](#)
- [Kings College London. Sentinel Stroke National Audit Programme \(SSNAP\) results portal](#)
- [NHS RightCare. RightCare Pathway: Stroke](#)
- [Royal College of Physicians. National Clinical Guideline for Stroke 2016 \(October 2016\)](#)
- [NICE. Stroke Rehabilitation in Adults 2013](#)
- [NHS Improvement. Psychological care after stroke \(November 2017\)](#)
- [Getting It Right First Time \(GIRFT\) - Stroke](#)
- [The Stroke Association. Current, future and avoidable costs of stroke in the UK](#)
- [The Stroke Association. State of the Nation 2018. \(February 2018\)](#)
- [Greater Manchester Stroke Operational Delivery Network](#)
- [The HEE workforce development STAR tool](#)
- [National Clinical Guideline for Stroke 2016](#)
- [NHS RightCare Stroke Pathway](#) October 2017 to support local commissioners responsible for stroke to improve services for patients in their area
- Webinar: Transforming stroke services across the whole patient pathway, September 2018. A recording of this webinar is available by request. Please email england.clinicalpolicy@nhs.net
- [Long Term Plan case studies](#) demonstrating how partnership work with the Stroke Association is improving care and support for stroke survivors
- The [Stroke Specific Education Framework](#) outlines core competencies for a range of professionals working with stroke survivors
- 7 day rehabilitation service [case study](#) from Torbay and Southern Devon Health and Care NHS Trust
- NHS Improvement's [Guidance on Psychological Support after Stroke](#) provides guidance to support the establishment and development of services for psychological care of people following stroke
- See an example of using [computer modelling](#) to improve acute stroke care in the South West.
- Achieving successful system change – [Lessons from stroke reconfiguration in London and Greater Manchester](#).
- An [overview of mechanical thrombectomy services](#)
- The [Stroke Association website](#) supporting the Long Term Plan
- [Royal College of Paediatrics and Child Health \(RCPCH\) guideline: Stroke in childhood](#) – clinical guideline for diagnosis, management and rehabilitation
- Royal College of Physicians Sentinel Stroke National Audit Programme (SSNAP). [Stroke health economics: Cost and Cost-effectiveness analysis 2016](#)

Applicable national standards:

2-

- NICE NG128 Stroke and Transient Ischaemic Attack in over 16s: Diagnosis and Initial Management
- NICE Quality Standard QS2 (Stroke in Adults; 2016)

- RCP National Clinical Guideline for Stroke 5th Edition, 2016 (<https://www.strokeaudit.org/Guideline/Guideline-Home.aspx>)
 - see also RCPCH NICE accredited guidance for stroke in under-16s.
- 3-
- NICE NG128 Stroke and Transient Ischaemic Attack in over 16s: Diagnosis and Initial Management
 - NICE Quality Standard QS2 (Stroke in Adults; 2016)
 - see also RCPCH NICE accredited guidance for stroke in under-16s.
- 5-
- These standards apply across all rehabilitation services
- NICE NG128 Stroke and Transient Ischaemic Attack in over 16s: Diagnosis and Initial Management
 - NICE Quality Standard QS2 (Stroke in Adults; 2016)
 - RCP National Clinical Guideline for Stroke 5th Edition, 2016 (<https://www.strokeaudit.org/Guideline/Guideline-Home.aspx>)
 - see also RCPCH NICE accredited guidance for stroke in under-16s.
 - NICE Quality Standard QS2 (2016) with particular reference to specialist therapy assessment time and frequency including Physiotherapy, Occupational Therapy, Speech and Language Therapy and psychology
- 6-
- NICE Stroke rehabilitation in adults (2013)
 - NICE Stroke in Adults Quality Standard (Stroke in Adults; 2016)
 - NHS RightCare Pathway: Stroke

Applicable standards set out in Guidance

- RCP National Clinical Guideline for Stroke 5th Edition, 2016 (<https://www.strokeaudit.org/Guideline/Guideline-Home.aspx>)
- RightCare: Stroke <https://www.england.nhs.uk/rightcare/products/pathways/stroke-pathway/>
- NHS England Commissioning Guidance for Rehabilitation. <https://www.england.nhs.uk/wp-content/uploads/2016/04/rehabilitation-comms-guid-16-17.pdf>
- NHSI Stroke Rehabilitation in the Community Commissioning for Improvement. https://www.visionuk.org.uk/download/archive_1/pdf/Stroke_Rehab.pdf
- Further information regarding childhood stroke is available from the [RCPCH](#))

Evidence

An Evidence Review by Kings College London for NHS England and NHS Improvement

Full access to evidence the evidence overview is available on the NHS England and NHS Improvement webpage once published, it summarises what we currently know and what we don't know across the stroke care pathway. Key points are listed below;

Stroke prevention in primary care

- Up to 90% of stroke cases are preventable, through improving key risk factor management including hypertension, poor diet, overweight, smoking, inactivity, dyslipidemia, and atrial fibrillation
- Primary care is the ideal place to tackle these risk factors in the general population
- Key priorities for stroke prevention include better detection and treatment of atrial fibrillation, and continuing improvements in control of vascular risk factors
- Programmes such as the NHS Health Check programme have succeeded in realising reductions in smoking, and increased statin prescription; but so far there is no evidence of clinically meaningful reductions in other risk factors, for example hypertension, in participants

Pre-hospital admission management of stroke

- Acute stroke treatments are time sensitive. Increasing stroke awareness, enabling people to recognise and respond to stroke symptoms by calling 999, would likely increase the proportion of ischemic stroke patients eligible for acute stroke treatment.
- Determining the optimal approach to increasing and sustaining stroke awareness of symptoms and appropriate response could decrease post-stroke disability.

Acute management of stroke

- Stroke care has undergone significant changes with the establishment of dedicated stroke units across England. Re-organisation into a smaller number of highly specialised hyper-acute stroke units occurred in the densely populated metropolitan areas of London and Greater Manchester. These reconfigurations have proved cost-effective and have led to improvements in patients' outcomes.
- There are workforce shortages. Re-organisation of services in urban areas might improve the efficient use of scarce resources. The increase in travelling times may limit this in rural areas.
- The seven-day service standard for acute stroke services requires an increase

in the stroke workforce. Focus on cross-speciality or cross-profession accreditation of particular competencies, as set out in the NHS Long Term Plan, might help to address this.

- The risk of stroke after a Transient Ischaemic Attacks (TIA) is approximately 10% during the first few months. Furthermore, 5% will die due to a subsequent stroke within the first 6 months.
- Assessment and treatment within 24 hours after a TIA is critical. Timely initiation of secondary prevention post-TIA can reduce the relative risk of recurrence by 80%.
- Intravenous thrombolysis (IVT) is one of the few approved acute treatments for ischaemic stroke. It improves long-term outcomes, and is cost-effective.
- The benefits of IVT are highly time dependent. Although the current treatment window is 4.5 hours, treatment is more effective the earlier it is given.
- There is overwhelming evidence for the effectiveness of mechanical thrombectomy in improving functional outcomes in patients treated within 6 hours of the onset of a proximal large vessel occlusion in the anterior circulation. One in 2.6 patients undergoing mechanical thrombectomy experience reduced disability and one in five achieve functional independence.
- Urgent management of intracerebral haemorrhage by tight blood pressure control and reversal of anticoagulation improves outcomes

Acute care in the stroke unit (after immediate interventions)

- People who have had a recent stroke are likely to have a number of acute care needs relating to the need to maintain physiological homeostasis in the face of their co-morbidities, the stroke itself, its treatments and its complications.
- Adequate medical and nursing staffing and the ability to monitor physiological and neurological parameters are required to optimise patients' clinical conditions.
- Allied health professionals have an important role in early determination of levels of physical function and to enhance mobilisation, positioning and swallow care.

- A multidisciplinary team based approach is required to determine the correct pathway for onward care.

Rehabilitation in Hospital

- There is strong evidence that a coordinated multidisciplinary team approach including rehabilitation results in a reduction in death, institutionalisation, and dependency.
- Current UK guidelines recommends that patients should 'accumulate at least 45 minutes of each appropriate therapy every day at a frequency that enables them to meet their rehabilitation goals'. National audit data have shown improvements towards this target particularly via seven day working.
- Despite the advances, stroke survivors and their families still perceive services fall short of their needs. Further work is required to identify the optimal timing, dose and content of hospital delivered rehabilitation.

Rehabilitation in the community

- There is no single optimal rehabilitation pathway for stroke survivors, given the wide range of symptoms, levels of disability and individual circumstances that are experienced. The National Stroke Programme supports the implementation of Integrated ESD and community stroke /neuro rehabilitation services to provide appropriate therapies for as long as required to meet rehabilitation goals. This will be achieved, through integrated working between the NHS, social care and the voluntary sector. Resource is also required to provide much needed psychological support and vocational rehabilitation.

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