

National Stroke Service Model

Integrated Stroke Delivery Networks

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Equality and Health Inequalities Statement:

Promoting equality and addressing health inequalities are at the heart of NHS England's values. Throughout the development of the policies and processes cited in this document, we have:

- Given due regard to the need to eliminate discrimination, harassment and victimisation, to advance equality of opportunity, and to foster good relations between people who share a relevant protected characteristic (as cited under the Equality Act 2010) and those who do not share it; and
- Given regard to the need to reduce inequalities between patients in access to, and outcomes from healthcare services and to ensure services are provided in an integrated way where this might reduce health inequalities.

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Foreword

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, they will prevent thousands of patients suffering a stroke, through improved diagnosis and access to treatment in 24/7 specialist stroke units, and increase the availability of high quality rehabilitation and ongoing community care to rebuild patients' lives after a stroke.

By driving improvements, 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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Part 1: ISDN composition and core functions

Overview

[The NHS Long Term Plan](#) (LTP, 2019) set outs the ambitions for the NHS over the next 10 years, identifying [stroke as a clinical priority](#) for the next 10 years. It outlines how we will work with partners to improve stroke care along the entire pathway, from prevention to rehabilitation.

A networked approach based on patient flows will be essential to delivering the NHS Long Term Plan commitments for stroke: reducing stroke mortality and disability, as well as the burden stroke places on families and carers, on the health and social care system and on wider society. For this, integrated stroke delivery networks (ISDNs) in all areas of England will bring services together to design optimal stroke pathways, from pre-hospital to early supported discharge (ESD), community specialist stroke-skilled rehabilitation and life after stroke support. They will support the delivery of the NHS's seven-day standards for stroke care;¹ and optimise the delivery of safe and effective treatments and rehabilitation to those who have a stroke.

There is strong evidence that investigations and interventions for stroke, such as brain scanning and thrombolysis, are best delivered as part of a 24/7 networked service that includes comprehensive and acute stroke centres (CSC, ASC) of a sufficient size to ensure expertise, efficiency and a sustainable workforce.² Networked configurations with hyper-acute stroke units (HASUs) have led to better patient outcomes, including a 5% relative reduction in mortality at 90 days and reduced length of stay.^{3,4} An evaluation in Northumbria demonstrates the value of networked provision in rural areas.⁵

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.

The current evidence from network optimisation was captured before 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.

¹ The Keogh Urgent and Emergency Care Review (2013)

² Access to and delivery of acute ischaemic stroke treatments: A survey of national scientific societies and stroke experts in 44 European countries (2018)

³ Hunter RM (2013) Impact on clinical and cost outcomes of a centralized approach to acute stroke care in London: A comparative effectiveness before and after model.

⁴ Morris S, Hunter RM, Ramsay A, Boaden R, McKevitt C, Perry C, Pursani N, et al (2014) Impact of centralising acute stroke services in English metropolitan areas on mortality and length of hospital stay: difference-in-differences analysis. *BMJ* 349: 4757.

⁵ Elameer M, Price C, Flynn C, Rodgers H (2018) The impact of acute stroke service centralisation: a time series evaluation.

Thrombectomy has been demonstrated to significantly reduce disability. Stroke networks, with full national coverage, will be essential to enable the delivery of thrombectomy to all patients amenable to this intervention.

ISDN objectives

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

Key ambitions

- Best practice personalised stroke pathways configured and managed from pre-hospital care onward, including ambulance, thrombectomy, ESD and six-month reviews, and then building to cover the entire 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 that meets the needs of clinicians, commissioners and patients in capturing care quality and outcomes.

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

OBJECTIVES

1: Leadership

- Provide robust clinical and stroke programme leadership. This should include medical, nursing and therapy senior leadership to ensure the acute and community pathways are given equal focus.
- Develop and agree with system leaders a co-ordinated approach to network resourcing, to secure the best outcomes for patients.

2: Strategic approach

- Support integrated care systems (ICSs) to develop a strategic approach to improving local stroke pathways, in line with the ISDN pathway specification (see Part 2 of this document).
- Ensure collaborative working with ICS and provider workforce leads to manage system capacity and demand. Key actions may be to:
 - ensure collaborative activity monitoring and demand forecasting
 - support/lead strategic capacity planning and development as appropriate
 - develop robust, creative and sustainable workforce plans for delivery of the stroke service specification, based on individual capabilities and development for all staff.
- Horizon scanning – participate in national forums to ensure that as healthcare technologies advance and new intelligence is introduced, the local workforce will be supported to develop and deliver innovations in patient care.

3: Optimal configuration and collaboration

- Support the implementation of the 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.
- Lead collaboration with all relevant stakeholders and partners.
- Deliver specialist stroke-skilled integrated community rehabilitation pathways against a national standard needs-based service model.
- Identify and manage cross-boundary issues and patient flows with neighbouring ISDNs, ICSs, NHS regions, voluntary care sector, local authorities, Wales and Scotland as appropriate.
- Work collegiately with organisations and programmes that support stroke care.
- Ensure effective patient flows and care pathways across the ISDN with clinical collaboration and co-ordination between all stakeholders including the voluntary sector.

4: Data, monitoring and reporting

- Ensure full engagement with the Sentinel Stroke National Audit Programme (SSNAP), monitoring network performance and recommending or instigating appropriate improvement support. This includes supporting the delivery of the NHS England and NHS Improvement and GIRFT Stroke Programme regional recommendations.
- Support the monitoring and reporting of consistent, high quality stroke care by ICSs through the delivery of the national clinical standards for stroke.

ISDN governance

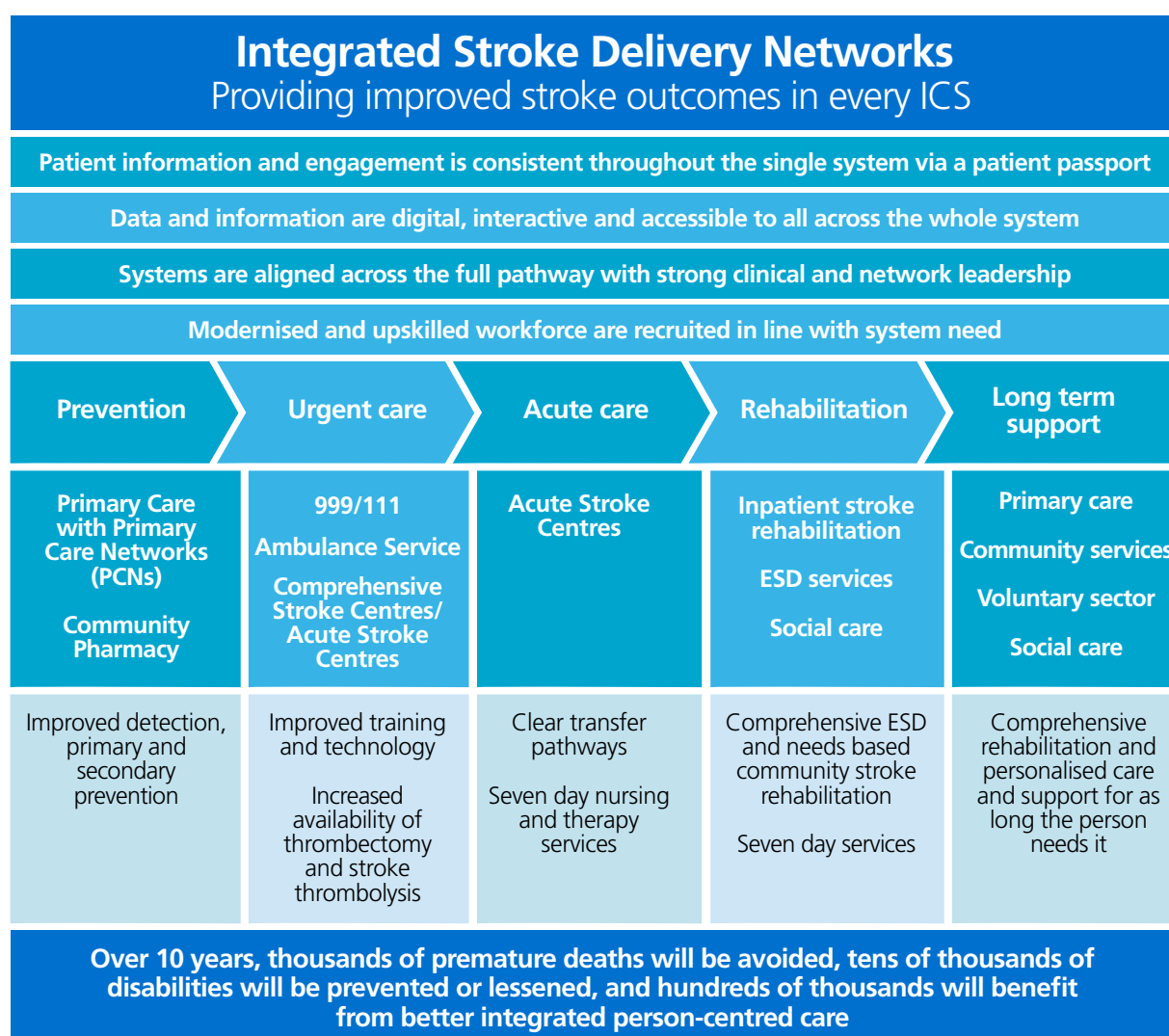
- The NHS England and NHS Improvement Stroke Programme Delivery Board will nationally oversee ISDN performance. The board reports to the overarching Cardiovascular Disease (CVD) and Respiratory Programme Board; including by tracking the key performance metrics reported by SSNAP.
- The regional CVD and Respiratory Programme senior responsible owner (SRO) will regionally oversee ISDNs. This regional oversight and support should ensure that plans for optimal service configuration, which may cross ICS and existing network boundaries, address the current variation in pre-hospital, acute and post-acute stroke provision.
- ISDNs will provide assurance on behalf of their ICSs on the quality of stroke services to the regional CVD and 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 ICSs
 - 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. This will develop recommendations and plans to send to the steering group/board for approval.
- A governance framework clarifying accountability and including 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 delegated responsibility for stroke care across the population they serve.
- ISDNs will co-ordinate improvement in line with linked programmes reflecting national and local priorities, including diagnostic network 'lean imaging' pathways.

ISDNs 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

- While thrombectomy is likely to be delivered in up to 30 centres nationally (based on geographical and population modelling, 22 or 23 neurosciences centres and five to seven non-neuroscience thrombectomy centres), all stroke receiving centres will require effective and well-managed referral and repatriation pathways to ensure all patients have access to thrombectomy 24/7. ISDNs should be aware of draft service specification timelines to achieve this objective within the specialised commissioning specification, and support the thrombectomy centres to deliver against these targets; for some this may require cross-regional solutions.
- Flexible and innovative models of service delivery may be needed in rural areas, and should be supported by each ISDN.
- Each ISDN should be based on between one and four ICSs, to achieve the most appropriate patient pathways, flows and operational geographies.
- ISDN footprints should be co-designed by ICSs and stakeholders, and overseen through the regional CVD and Respiratory Programme structure, supported by national modelling where appropriate, and consider existing networks, patient flows, thrombectomy centres and service configuration proposals.
- ICSs should adopt a partnership approach to the development of ISDNs, and ensure multidisciplinary team (MDT) clinical, primary, secondary, tertiary, community, social care and voluntary sector perspectives are involved.
- ISDNs should avoid duplication by making use of existing expertise and drawing on strategic clinical networks (SCNs), as appropriate, in line with regional planning. We anticipate ISDNs will become the single network for stroke in each area, which may for instance mean pump-priming them 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 structure will present an opportunity for validation of ICS strategic governance, footprints and appropriate patient flow, including for thrombectomy, and change as appropriate.
- ISDNs will include all relevant stakeholders, including patients and the public, in pre-hospital care through to community rehabilitation and life after stroke support.
- While most ISDNs will include a thrombectomy centre, all ISDNs must identify access to one or more.

Figure 1: ISDN infographic



Patient and Public Voice in ISDNs

- Stroke survivors must be involved in discussions and decisions about stroke care to ensure stroke services 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 two patient representatives are on its delivery board.

- Local systems should ensure that decisions about stroke services involve 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 for [co-production and public engagement](#) is available from the FutureNHS website.

ISDN establishment

Progress so far: Completed - August 2020 to March 2021

1. Agreement

Signed off terms of reference (see ISDN structure and governance above) and confirmed ISDN boundaries and mitigating actions for identified cross-boundary issues.

2. Funding

Confirmed funding and hosting arrangements for employment of relevant staff.

3. Mobilising

Operationalising teams, which includes agreeing hosting arrangements for core ISDN staff in line with an agreed network management structure, and includes at least:

- clinical leadership that encompasses the entire stroke pathway from prevention through to life after stroke. We expect that this will be delivered by practising clinicians with designated sessions for clinical leadership (this leadership may be shared between medical, nursing, therapy leads)
- an ISDN manager and administration support.

Have access to a support team including data analytics and administration.

4. Governance

Embedded robust governance at a regional level. With 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

Established links with neighbouring ISDNs to manage any cross-boundary flows.

Agreeing 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 voluntary sector support; building on current service provision.

6. Links

Established links to all other relevant networks including regional GIRFT Implementation hubs, primary care networks, academic health science networks, strategic clinical Nnetworks and senates and into voluntary sector links.

In progress: April 2021

7. Priorities

Agree priorities that focus on delivery of the stroke components of the NHS Long Term Plan to improve outcomes for stroke patients across all aspects of care, from prevention through to life after stroke and end of life care.

8. Operation

Have an operational plan to develop clear patient pathways including pre-hospital assessment, thrombectomy, stroke unit care, and early supported discharge and community stroke/neuro rehabilitation into community and social care and voluntary sector support building on current service provisions.

Part 2: ISDN Pathway Specification

Introduction

This part outlines what we understand to be best practice for the NHS in caring for adult (over 16 years of age) stroke patients, reflecting a recently commissioned evidence review from King's College London and examples of excellence witnessed by the GIRFT stroke programme. It presents clear ambitions for every area of the country to develop and implement as part of its strategic delivery of the NHS Long Term Plan.

Many ISDNs will already be achieving much of the network specification below. This 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 increase access to thrombolysis and thrombectomy.

Following extensive consultation with stroke survivors and stroke specialists we propose renaming the stroke units to:

- comprehensive stroke centre (CSC) – hyper-acute, acute and inpatient rehabilitation including thrombectomy and neurosurgery
- acute stroke centre (ASC) – hyper-acute, acute and inpatient rehabilitation, but **excluding** thrombectomy and neurosurgery
- stroke recovery unit (SRU) – acute and inpatient rehabilitation only.

1: Prevention

Stroke prevention is achieved primarily in the community: targeting both the high-risk general population (primary prevention) including those specifically at higher risk through social inequalities, and those discharged following a stroke or transient ischaemic attack (TIA) (secondary prevention). It is however the responsibility of the ISDN and all healthcare 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 focus on communication with patients, their relatives or carers, GPs, and others involved in their care, to ensure patient ownership of decisions relating to them. Patients' differing health beliefs and needs should be clearly acknowledged, with particular attention paid to seldom heard groups and those with communication difficulties. Patient understanding of, and adherence to, prevention should be everyone's responsibility.

As much as 90% of stroke disease may be preventable through treating and addressing key risk factors for stroke, including hypertension, hypercholesterolaemia, atrial fibrillation (AF), poor diet, obesity, smoking and lack of physical exercise. The use of innovative strategies and technologies should be encouraged to detect and address physical and social economic risk factors for stroke, and the impact of health inequalities and digital inequalities recognised when managing high risk groups.

What do local stroke systems need to do?

Working with local primary care networks (PCNs), ISDNs should:

- support the introduction of the National Primary Care Audit, and respond to SSNAP indicator F6 (unmedicated known AF);
- support the implementation of the community pharmacy contract and involve local voluntary sector partners to provide the public with readily accessible screening for hypertension, particularly those from deprived and disadvantaged groups;
- ensure that primary and secondary care teams are adhering to the 140/90 blood pressure NICE guidance⁶;
- 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, eg smoking, weight and alcohol services, and;
- support delivery of the [NHS Long Term Plan](#) and [Public Health England CVD ambitions](#) around the three high-risk conditions – AF, high blood pressure and high cholesterol.

2: 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 use of communication technologies. Refreshing public awareness around common stroke symptoms can drive earlier and better-informed 999 calls.

⁶ <https://www.nice.org.uk/guidance/ng136/chapter/recommendations>

Service outcomes

Clinical assessment by pre-hospital staff:

- Most patients will receive a category 2 999 response and meet category 2 ambulance service standards. National work is ongoing to examine the evidence base for recommending any changes to 999 call categorisation.
- Patients with suspected acute stroke must be screened using a validated tool, and transferred if appropriate (including patients whose ambulance service staff suspected to have had a stroke despite a negative screening result) to a CSC or ASC.
 - Pre-hospital triage supported by telemedicine linked to a senior stroke clinician should be considered to allow early identification of patients for possible thrombolysis or thrombectomy, with the option to convey them directly to a CSC 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.
- All suspected stroke patients should be assessed and managed in accordance with best clinical practice and monitored for AF 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 a CSC or ASC. There will be occasions when this is not appropriate, but only following detailed discussions with an ASC 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 by technology such as 'apps' or telemedicine where appropriate, to underpin agreed clinical pathways and maintain sustainable admission levels to ASC or CSC. Both low cost off-the-shelf technologies and more bespoke products may be used.
- Clear local arrangements must be in place to enable pre-hospital clinicians to locate the closest available ASC or CSC at any time.

A pre-alert system is needed to communicate patient characteristics and ensure all patients are met by the stroke team on arrival at the ASC or CSC.

Intra-hospital transfers:

- Intra-hospital transfer for thrombectomy should be treated at least 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 minutes of arrival to make it possible for the initial ambulance team to be the one to transfer viable thrombectomy patients onward from an ASC to a CSC.

3: Hyper-acute stroke care

Hyper-acute care typically covers the first 72 hours after admission. Every patient with acute stroke should gain rapid access to a stroke unit (<4 hours) and receive an early multidisciplinary assessment.

Hyper-acute stroke services provide expert specialist clinical assessment and rapid multi-modal brain imaging, and the ability to deliver intravenous thrombolysis 24/7 transfer or treatment for thrombectomy. These services must be delivered in an ASC or CSC that provides hyper-acute and acute care 24/7, and each centre must care for a volume of patients that makes the service clinically sustainable, maintains workforce expertise and ensures good clinical outcomes.

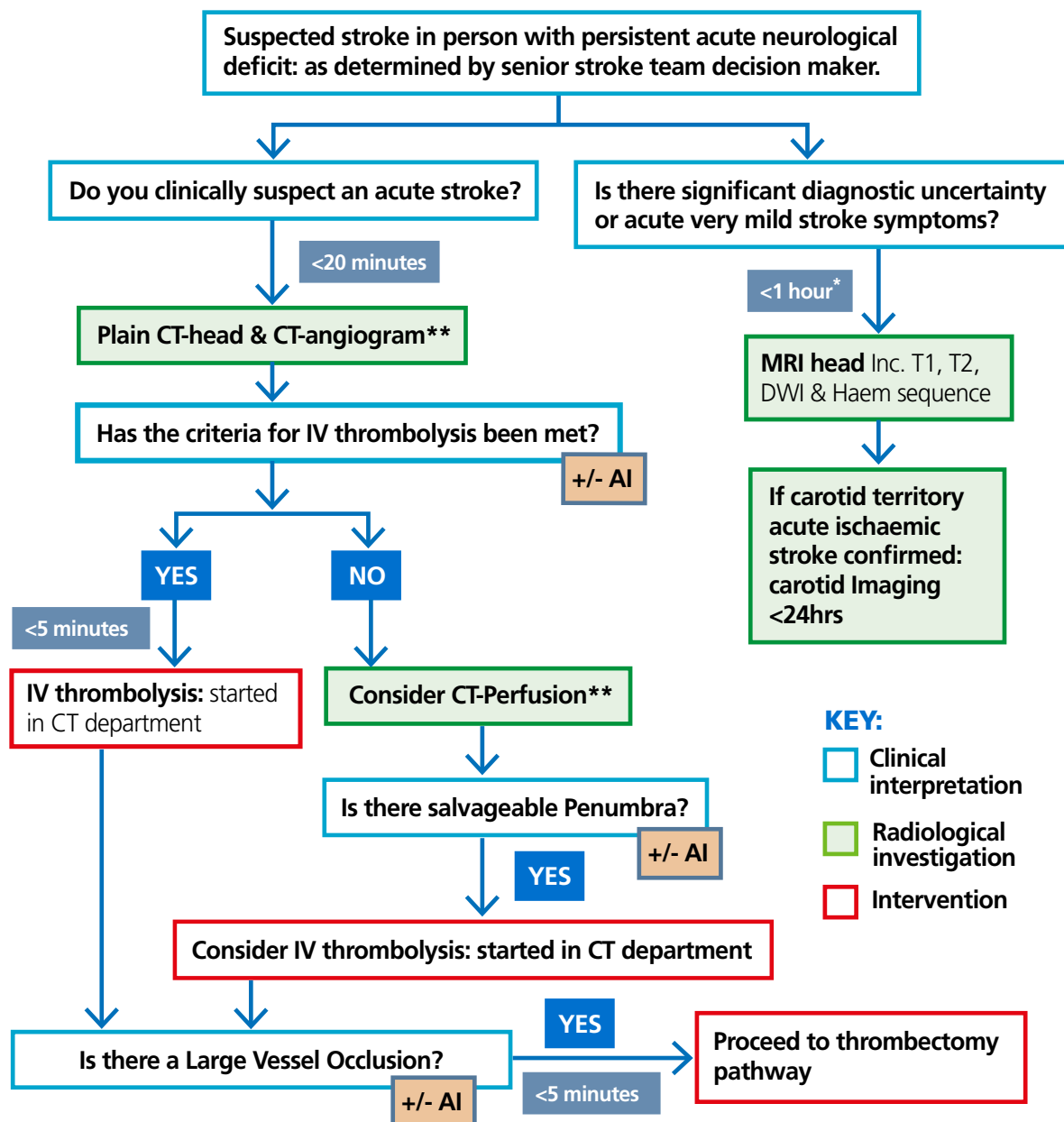
As part of the National Medical Director's Clinically-led Review of NHS Access Standards, critical time standards are being developed in partnership with expert clinicians and patient groups, which will set out a package of tests and interventions expected to be delivered within a given time period for patients presenting at EDs with suspected stroke, against which services will be measured. Services should also implement pathways which seek to meet these standards, if they are different to those set out above

Neurovascular imaging

Neurovascular imaging of the brain and vessels supplying it underpins the diagnosis and management decisions for the modern treatment of stroke. ISDNs should ensure that there is a networked agreement to the pivotal role of rapid imaging using the most appropriate modality; and that this aligns with up-to-date evidence and national guidance. This will ensure effective use of limited imaging resources while enabling stroke teams to deliver cost-efficient, time-dependent interventions to reduce disability and/or extended hospital admissions. The use of artificial intelligence (AI) in stroke care should be encouraged and deployed in line with its certified and pre-specified use or within a research environment. Image sharing between centres within and external to each ISDN should be optimised to provide timely patient-centred decisions and to align with the ICS imaging networks.

A national optimal stroke imaging pathway has been developed based on the best evidence and extensive expert consensus, including the NHS National Imaging Optimisation Delivery Board and the Intercollegiate Stroke Working Party (Figure 2).

Figure 2: National Optimal Stroke Imaging Pathway



Service outcomes

All service outcomes detailed in “Section 4: Acute stroke care” also apply to hyper-acute care unless stated otherwise 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. There appropriately trained staff in a consultant-led stroke team will provide immediate, structured assessment to determine diagnosis, suitability for thrombolysis or 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 minutes 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 optimise treatment, all patients must be admitted directly to a stroke unit and receive early multidisciplinary assessment that involves as a minimum stroke specialist nursing input, stroke specialist medical input and swallow screening within four hours.

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

Patients presenting with stroke may be under specialist medical care for other significant co-morbidities, eg haematological disorders, significant cardiac disease and neurological conditions. It is not uncommon for adults and children with a haemoglobinopathy to present with stroke, and their stroke treatment plan can be more complex. Management will need careful and early collaboration between the hyper-acute stroke team and specialist teams to determine the correct treatment plan, eg exchange transfusion, thrombolysis or both, and to ensure this can be enacted in a timely fashion. The stroke pathway should make it clear that the appropriate haemoglobinopathy co-ordinating centre or specialist haemoglobinopathy team are contacted if a patient with a haemoglobinopathy, such as sickle cell disease, presents with a stroke⁷.

⁷ <https://www.england.nhs.uk/commissioning/spec-services/npc-crg/blood-and-infection-group-f/f05/specialised-haemoglobinopathy-services/#sickle-cell-disease>

Thrombolysis

Intravenous thrombolysis should be provided 24/7 to stroke patients deemed suitable for this, with an appropriate protocol in place to screen patients against the medical criteria for thrombolysis⁸.

- Stroke patients to be scanned, assessed by a stroke specialist and, if appropriate, receive thrombolysis within 60 minutes and ideally within 20 minutes of admission (door to needle time).
- 24/7 access to perfusion brain imaging (CTP or MRP) should be available, with rapid interpretation to support decision-making. AI and off-site expertise can support this where appropriate.
- Thrombolysis should be provided to all appropriate patients. Up to 20% of stroke admissions across the ISDN may be amenable to this.

Thrombectomy

Thrombectomy must be provided as soon as possible to all appropriate patients in line with NICE guidance¹⁰ to maximise patient benefit. 24/7 emergency intra-hospital thrombectomy transfer pathways must be in place for all ACS. Repatriation flows must also be established, agreed and supported by the whole system.

- All potential thrombectomy patients should have a CT angiogram as part of their initial brain scan; with 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. Up to 10% of stroke admissions across the ISDN may be amenable to this.

Intracerebral Haemorrhage (ICH)

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

- reversal of anticoagulation therapy where appropriate
- lowering of blood pressure in line with current guidance (ISDN annual review)
- referral to a neurosurgical centre for consideration of intervention, considering location and calculation of intracerebral volume. Clear referral protocols in line with current guidance (ISDN annual review) should be in place, and routine referral avoided
- consideration of referral to intensive therapy units to support cardiorespiratory and renal systems while the definitive treatment plan is finalised
- consideration of end-of-life care where appropriate, eg for catastrophic events.

Regular neurological observation is needed with 24/7 access to repeat brain imaging within an hour of any further deterioration.

⁸ <https://journals.sagepub.com/doi/full/10.1177/2396987321989865>

⁹ <https://www.nice.org.uk/guidance/ng128/chapter/recommendations#pharmacological-treatments-and-thrombectomy-for-people-with-acute-stroke>

Monitoring and mobilisation

Protocols must be in place to ensure appropriate monitoring of all patients by stroke-trained staff during the entire hyper-acute phase. This includes daily senior stroke specialist medical ward rounds.

Early mobilisation must only be offered, if at all, within 24 hours to patients who require minimal support to mobilise¹⁰.

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, patients who are >24 hours 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 on-site access to the following support services and clinical interpretation:

- Urgent brain imaging, with patients scanned in the next scan slot (ideally within 20 minutes and a maximum of 60 minutes) and skilled interpretation available 24/7, supported where necessary and appropriate by AI.
- Vessel imaging and assessment of salvageable penumbra, eg CTA/CTP, should be considered in line with symptoms and ideally as part of the first brain scan on admission (see Figure 2). All other patients should be able where clinically appropriate to access extracranial vessel imaging within 24 hours of admission, alternatives being ultrasound of the carotids or MRA.

Effective and timely referrals to specialist neurosurgical and vascular procedures are sometimes necessary to prevent further damage following a stroke or a second stroke. Networks must ensure that images are immediately available to these services.

Where appropriate, neurosurgical services must be provided as early as possible, with rapid recognition of the need for surgical intervention.

Neurovascular surgical services

All patients with a suspected non-disabling stroke or TIA must have urgent access to neurovascular surgical services, including carotid intervention (eg carotid endarterectomy):

- For recently symptomatic significant carotid stenosis (according to validated criteria), carotid intervention should be regarded as an urgent procedure and performed within seven days of symptom onset, where the patient is neurologically stable and it is clinically appropriate.

⁷ https://www.stroke.org.uk/sites/default/files/tsa_2009-09_langhorne_final_report_summary.pdf

- Patients with a non-disabling stroke or TIA who require carotid endarterectomy should be admitted for urgent investigation and, if appropriate, carotid surgery should be available within 48 hours and at least 7 days of radiological confirmed 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.

Neurosurgical 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 ICH and 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).

4: Acute stroke care

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

Service outcomes

All stroke patients should have access to high quality stroke care and for most of their time in hospital should be under specialist stroke care, with access to:

- early and regular communication with them and their nominated relative or carer about diagnosis, interventions, prognosis and transfer of care plans
- stroke inpatient rehabilitation as per Section 6.1
- 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 receipt and discharge of patients seven days a week
- a stroke trained MDT available seven days a week
- a venous thromboembolism (VTE) risk assessment with appropriate prescription and administration of intermittent pneumatic compression where justified in accordance with NICE recommendations¹¹, and regular review of VTE risk and management based on changes in mobility and time since the stroke event, using a stroke-specific decision

³ <https://pathways.nice.org.uk/pathways/venous-thromboembolism/reducing-venous-thromboembolism-risk-medical-patients.pdf>; p4

support aid

- assessment or treatment by all appropriate specialist therapists (physiotherapist, occupational therapist, speech and language therapist) within 24 hours of admission, and others (eg dietitian, orthoptist) within 72 hours
- 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
- reassessment if loss of bladder control continues two weeks after diagnosis, and by week 3 for an ongoing treatment plan that has involved patients and carers to be jointly agreed
- comprehensive secondary prevention advice and treatment must be provided to all with interventions to improve adherence and persistence with medication and lifestyle 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 hours of decision
- a formal discharge summary report must be shared with the referrer, GP and patient, with a named contact (if requested) for the day of transfer of care
- 6/52 follow-up; for most patients this need not 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, and medication adherence, along with an understanding of the condition and patient reported outcomes (PROMS).

Access to and interdependence with other services/providers

Acute stroke services must have on-site access to brain imaging (MRI and CT).

Furthermore, acute stroke services must have agreed access (not necessarily on-site) via clear protocols to the following support services and clinical interpretation:

- carotid imaging (including ultrasound/MRA/CTA)
- thrombectomy
- neurosurgery
- vascular surgery for carotid endarterectomy as per Section 3.

5: TIA services

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 who through triage are deemed likely to have had a TIA; other patients who require review should be seen within one week or signposted to more appropriate clinics. After specialist assessment in the TIA clinic, consider MRI (including diffusion-weighted and blood-sensitive sequences) to determine the territory of ischaemia, or to detect haemorrhage or alternative pathologies. If MRI is done, perform it on the same day as the assessment.

Do not offer CT brain scanning to people with a suspected TIA unless there is clinical suspicion of an alternative diagnosis that CT could detect¹².

Service outcomes

Referrers should discontinue the use of risk stratification tools, eg ABCD2, to triage patients. All patients with suspected TIA must be 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 who have had a TIA may have care and support needs beyond secondary prevention; it is the TIA service's responsibility to help them access any care/support/information/advice they require.

Acceptance and exclusion criteria and thresholds

- Patients whose suspected TIA occurred more than a week ago 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 and ECG.
- Brain scan (if vascular territory or pathology uncertain) – MRI and not CT.
- Prompt provision of evidence-based secondary prevention treatments for all risk factors that have an evidence-based intervention.
- Management of hypertension and AF.
- Written information and advice regarding stroke risk, secondary prevention with driving/flying/activity preclusion advice.
- Access to carotid imaging on the same day as assessment where indicated, with carotid intervention undertaken within 48 hours 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 \(BASP\)](https://biasp.org/wp-content/uploads/2022/03/BASP-Stroke-Medicine-Workforce-Requirements-Report-FINAL.pdf) joint workforce tool, as well as local and national intelligence (2019-20).

³ <https://biasp.org/wp-content/uploads/2022/03/BASP-Stroke-Medicine-Workforce-Requirements-Report-FINAL.pdf>

- Engage closely with ambulance providers to ensure robust transfer pathways are developed and prioritised, including category 2 intra-hospital transfers for potential thrombectomy patients.
- Ensure ambulance service training and operational capacity for stroke is prioritised with any proposed service transformations.
- Ensure TIA and stroke 'mimic' activity, including neurology patient flow, is considered within all service modelling, development and transformation.
- Consider the potential for ICS capital funds to support service transformations at a system level.
- Ensure that technology and pricing are considered within short and medium-term service developments.
- If system transformation is likely to require large-scale service change, '[Planning, assuring and delivering service change for patients](#)' offers guidance on navigating a clear path from inception to implementation for those considering and involved in substantial service change, including effective public engagement.
- The FutureNHS 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. It is also available for co-production and [public engagement](#).
- Where changes cross multiple local authority areas, as is likely for ISDNs covering multiple ICS areas, and early work suggests service delivery will change significantly, consider whether it would be helpful to establish joint health overview and scrutiny arrangements at an appropriate time during development of the plans.
- Ensure strategic planning and transformation takes due account of health inequalities including via [modelling](#), as appropriate.

6: Rehabilitation

People who have had a stroke should have timely access to high quality rehabilitation appropriate to their need and desired outcomes. The MDT must work in partnership with the stroke survivor and those important to them, so they can maximise their recovery, independence and overall quality of life.

Inpatient rehabilitation services, ESD and community stroke/neuro rehabilitation services should work very closely together. They must ensure that their patients receive physiotherapy, occupational therapy, speech and language therapy, vocational rehabilitation, psychological rehabilitation and life after stroke support (see Section 7). They must also ensure that their patients can promptly access other specialist clinical services as needed, such as orthoptics and dietetics.

6.1: Inpatient rehabilitation

Inpatient rehabilitation is an essential bridge for many stroke survivors between acute stroke care and post-discharge integrated community rehabilitation. Its key outcomes overlap with those for acute stroke care, community rehabilitation and life after stroke.

Inpatient rehabilitation services should be provided by a SRU or within an ASC/CSC, and 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 a personalised rehabilitation plan, which must then be started 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, and be enabled and empowered to meaningfully participate in their rehabilitation.

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 stroke-related rehabilitation goals that can be met with greater intensity in an inpatient rehabilitation setting than in a community setting are eligible for inpatient rehabilitation.

This includes patients who are receiving palliative and end-of-life care (including access to therapy and specialist services where appropriate). When deciding whether such a patient would benefit from being offered inpatient stroke rehabilitation, 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.

6.2: Integrated community stroke service rehabilitation

Early Supported Discharge (ESD) must be available in all areas. ESD facilitates early transfer of care to a community setting, where rehabilitation continues at the same intensity and with the same expertise as in the inpatient setting.

In each area, community stroke rehabilitation should now be provided by an integrated community stroke service (ICSS). This is a multidisciplinary team that offers stroke rehabilitation at a range of intensities – from ESD, which tends to be a course of high-intensity rehabilitation that a patient receives over a relatively short period of time, to less-intensive rehabilitation courses that typically span longer periods of time.

We will publish the ICSS model in full in due course. This will give more detail about how the model should work and how community stroke services can begin to implement it. Until that point, the following should be regarded as the foundation principles for each ICSS:

- All stroke survivors who need community rehabilitation should be offered it by their ICSS.
- Goal-setting: all survivors (and carers where appropriate) should regularly review their rehabilitation goals with their ICSS (every four to six weeks). Goals should not be dictated to patients without their involvement, and should be incorporated into a personalised plan that allows the patient to take ownership of their rehabilitation.
- Intensity: national clinical guidelines state that on a day a stroke survivor receives therapy, they should accumulate at least 45 minutes. This is a minimum standard: the amount each patient actually receives each day, and the number of days on which they receive therapy, should be tailored to their rehabilitation goals.
- Length of treatment: national clinical guidelines state that the course of rehabilitation should last as long as the patient is willing and capable of participating, and showing measurable benefit from treatment. For service planning, this equates, on average, to six months. However, this is neither a target nor a ceiling – in many cases, the patient will require rehabilitation for a longer or shorter period of time.
- Carers: carers' needs should be assessed and they should be given appropriate training, such as moving, handling and dressing. Carers should also be given written information on the management plan and point of contact for stroke information.

- Hours of service: an ICSS should operate seven days a week. Weekend discharges from inpatient care should be planned in collaboration with ICSS staff to ensure that the ICSS can visit and assess the patient within 24 hours, if that is the most appropriate course of action for the patient. An ICSS's weekend priorities should be to support hospital discharges or transfers to reablement, and to preserve continuity of rehabilitation for high priority rehabilitation patients and newly-discharged patients.

Patients identified as eligible for ESD should be offered assessment and treatment in the community within 24 hours, at the same intensity as would be offered in the stroke unit (typically daily sessions) and based on clinical need tailored to personalised goals. For other patients, the intensity of provision must be established between stroke specialist, patient and carer, based on clinical need and tailored to personalised goals.

6.3: Psychological rehabilitation and support

Psychological and neuropsychological rehabilitation must be routinely available as part of the core service provision throughout the patient journey. The entire MDT must address the psychological, emotional, cognitive and neuropsychological effects commonly experienced by stroke survivors; these can greatly impact a person's engagement with rehabilitation, function, ability to return to work and ultimately quality of life.

Throughout care planning, clinicians and providers on the patient pathway should collaborate to address the patient's psychological needs. When required, specialist assessments and appropriate interventions should be sought from psychology services to meet needs and personalised goals, supporting the best possible patient experience and outcomes.

Service outcomes

Consistent provision and transitions

High quality psychological screening, assessment and personalised interventions will be offered and tailored appropriately for all levels of need throughout the entire patient pathway. This includes all staff at every patient contact routinely monitoring changes in cognition, behaviour 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 MDT to provide seamless psychological support to patients throughout their rehabilitation.

Success of psychological interventions will be measured

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

Access to and interdependence with other services/providers

ESD ICSS rehabilitation is suitable for stroke survivors with mild to moderate disabilities.

Interdependence with other services/providers

Psychological care and rehabilitation will require:

- accessible clinical psychology/neuropsychology services with stroke expertise, alongside wider, step-down emotional and psychological support pathways for all patients
- clinical psychologists/neuropsychologists with stroke expertise to train and clinically supervise the relevant wider psychological and emotional support service providers (eg IAPT therapists, counsellors and peer support workers in the third sector).

6.4: Vocational rehabilitation

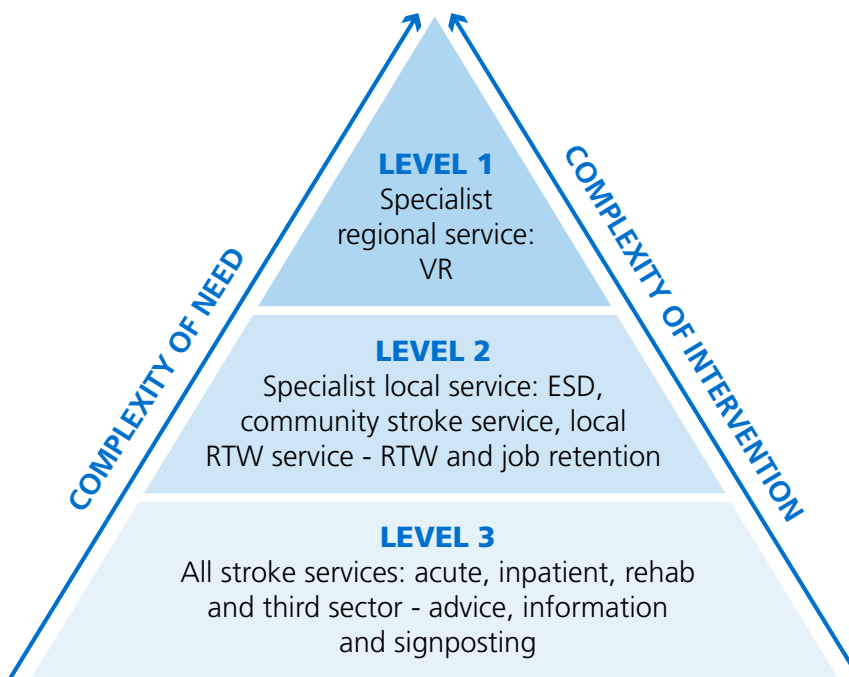
Vocational rehabilitation is ‘whatever helps someone with a health problem to stay at, return to and remain in work: it is an idea and an approach as much as an intervention or a service’¹³. Consistent provision is key to both improving patient experience and outcomes, and confronting the linked socioeconomic inequalities. All clinicians and 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 that is an integral part of all stages of the pathway 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 shown in Figure 3.

¹³https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/209474/hwwb-vocational-rehabilitation.pdf

Figure 3: Model for stroke vocational rehabilitation. The model pathway is dynamic, with the stroke survivor able to move non-linearly between its levels, depending on their changing needs and circumstances. Services must be 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 offered appropriate, advice, signposting and referral for more support to return to work.

Level 2 (Return to work service)

Stroke survivors who have a job to return to and want/need support to do so; or require advice on alternative options (ie redeployment, medical retirement, etc). A return to work plan should be implemented within six months.

Level 1 (Specialist vocational rehabilitation)

Any stroke survivor with a disability that prevents their return to work and/or for whom the return to work plan will take longer than six months to implement (eg they are currently unable to fulfil their present position; need additional support/advice on looking for suitable alternative employment; were not in work before their stroke and need additional support to find work; employer is not supportive of return to work plans; work environment cannot be adapted, etc).

Access to and interdependence with other services/providers

Vocational stroke rehabilitation may, with the person's 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 inpatient 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 and this is documented on SSNAP.
- Use data from six-month reviews to inform local needs mapping, workforce and service improvement planning.
- Develop robust systems for transfer of care when appropriate from stroke specialist services to generic rehabilitation and care services including voluntary sector support.
- Ensure that generic services are provided by those trained in stroke care and how to access specialist support.
- Develop information for stroke patients to support their engagement with and access to long-term rehabilitation, including self-management, vocational support, psychological support, social prescribing – drawing on national tools such as [My Stroke Guide](#).
- Ensure all commissioned rehabilitation services submit data via SSNAP for quality improvement.
- Review services to develop a service model that supports integrated community rehabilitation services for all stroke survivors across the geography covered by the ICSS.
- 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 they require it.

7: Life after stroke

Life after stroke (LAS) services provide the ongoing personalised care and support that people need to rebuild their lives and minimise risk of future 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

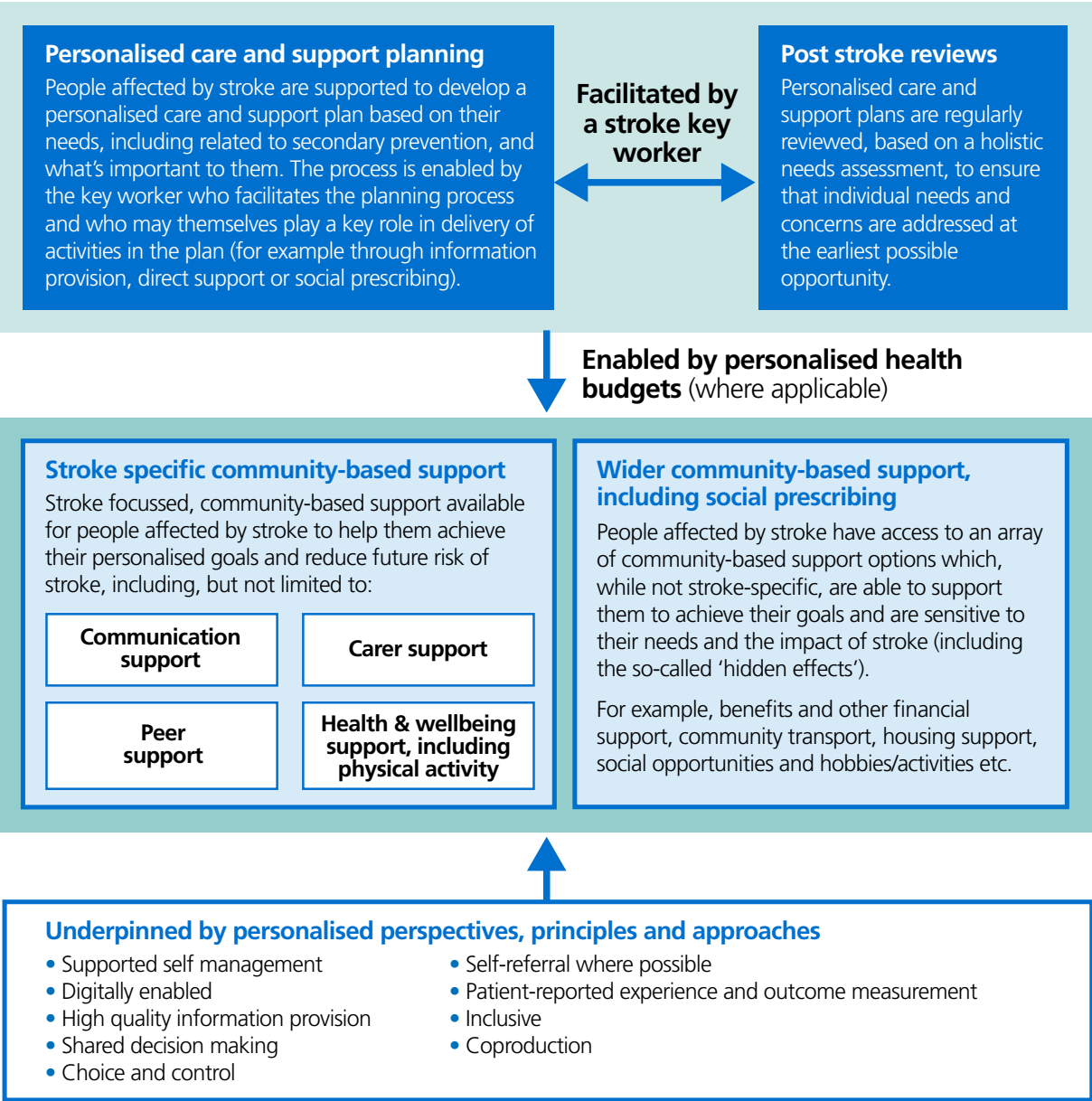
LAS services should be accessible to all people affected by stroke from the very acute phase onwards. People's needs, circumstances and what is important to them can change significantly over time, so they may need to continue to access these services long after their stroke.

LAS services should be integrated with the local ICSS (see Section 6) to ensure optimal multidisciplinary co-ordination of an individual's care and support. Their key components 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.

The discharging inpatient stroke team should refer their patient to a stroke key worker to ensure they can access appropriate personalised support. Key workers will 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 (Figure 4).

Figure 4: A guide to personalised life after stroke care-planning



Acceptance and exclusion criteria and thresholds

All people affected by stroke should have access to a key worker, and the mode and intensity of input provided should be 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.

Which LAS service components are required will be defined by a person's personalised care and support plan: the underpinning principle is that these services should be available to those who need them, when, where, how and for as long as they need them.

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 local ICSS, and relationships and care co-ordination should be supported through their attendance at MDT meetings.

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 LAS services.

- Ensure that all stroke survivors are appropriately offered a comprehensive holistic and person-centred six-month post-stroke review and that this 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.
- Ensure that generic services, including community-based support options, are trained in stroke care and support and how to access specialist input.
- Develop information for stroke patients to support their engagement with and access to long-term rehabilitation, including self-management, vocational support, psychological support, social prescribing – drawing on national tools such as [My Stroke Guide](#).

8: Workforce

ISDNs will engage in local stroke service workforce planning to support the needs of people with stroke, and contribute to regional plans and initiatives, including the development of novel, interdisciplinary and non-traditional roles using a capability-based model.

Workforce planning should consider the skills and competencies required to provide services as outlined and in line with patient need. The allocation of professional roles to some aspects of this specification is indicative, based on the skills typically required. A local skills analysis should be conducted to assess what skills are currently available to providers across the existing workforce. Depending on this, variation of the workforce model outlined may be appropriate. Workforce planning and transformation tools, such as Health Education England's (HEE's) [STAR tool](#), should be used where necessary to support this. The GIRFT and British Association of Stroke Physicians (BASP) stroke medicine consultant workforce model and the national Stroke Specific Education Framework ([SSEF](#)) should also be used for staff planning and training. Further information relating to workforce modelling 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 new roles are introduced to support this specification, or the numbers required to deliver this service change. Skills for early diagnosis and management of high risk conditions for stroke (primarily AF, high blood pressure and cholesterol) should be developed for all healthcare staff.

All staff will play a 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 inpatient services.

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](#) in conjunction with SSEF workforce modelling to optimise provision. Look to develop nursing and therapy advanced practitioner and consultant posts in conjunction with SSEF workforce modelling to optimise provision. Look to develop nursing and therapy advanced practitioner and consultant posts.
- Use the Leadership Academy¹⁴ development offer to embed leadership from bottom up across the ISDN footprint to support service transformation.
- Ensure inpatient and community MDTs include access to psychological, wellbeing and vocational rehabilitation/re-enablement support.
- Consider opportunities for shared or co-located staffing across teams and specialisms to support ISDN development.
- Ensure the local workforce plan equips the health and social care workforce with specific stroke skills, both for registered and non-registered staff in specialist teams and to upskill the non-specialist workforce.
- Ensure all commissioned services submit data via SSNAP, including organisational audit data, to capture workforce snapshots.

9: Data and evaluation

All ISDNs should:

- contribute 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);
- support their constituent services, both statutory and voluntary, to improve the response to national comparative audit; and
- report regularly to all stakeholders and the 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 their footprint. Regional and ISDN teams should currently use [SSNAP quarterly dashboards](#) to assure system performance, with a view to all elements of each service achieving an 'A' rating. A collegiate move to a faster reporting cycle with SSANP should be encouraged. Process scores within SSNAP should not be viewed in isolation but linked to outcomes, including recurrence rates, system cost and PROMs and PREMs.

³ <https://www.leadershipacademy.nhs.uk>

The National Primary Care Audit should be monitored to align focus on reducing incidence of stroke.

Each ISDN should increase thrombolysis and thrombectomy for the population it serves.

Feedback from the latter, including patient outcomes and unmet needs, should then be harnessed to inform systems transformation and quality improvement.

2019/20 SSNAP data should be used to baseline all metrics.

To support the headline metrics, a more detailed blueprint for development of further ISDN-level metrics (KPI dashboard) and trajectories will be co-designed with the new ISDNs. Local trajectories should be developed from local baselines and anticipate step-change improvements following network service transformation. ISDN trajectories should be developed in line with ICS plans. This will require patient experience data to be collected across the whole pathway, with the voluntary sector helping to do so.

10: Delivering the NHS Long Term Plan

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.

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.

Resources

Available supporting resources

National stroke resources

- [NHS England website – Stroke](#)
- 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
- [NHS Long Term Plan – Stroke](#)
- [Getting It Right First Time \(GIRFT\) – Stroke](#)
- [NHS RightCare Stroke Pathway](#) (October 2017) to support local commissioners responsible for stroke to improve services for patients in their area
- [An overview of mechanical thrombectomy services](#)

Rehabilitation

- [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
- [NICE. Stroke rehabilitation in adults](#) (2013)
- NHS Improvement. [Psychological care after stroke \(November 2017\) provides guidance to support the establishment and development of services for psychological care of people following stroke](#)
- Transforming stroke services across the whole patient pathway (September 2018). A recording of this webinar is available on request. Please email england.clinicalpolicy@nhs.net

Workforce

- BASP/GIRFT [Consultant workforce guidance](#) (July 2019)
- The [Stroke Specific Education Framework](#) outlines core competencies for a range of professionals working with stroke survivors
- [The HEE workforce development STAR tool](#)

Data

- [King's College London. Sentinel Stroke National Audit Programme \(SSNAP\) results portal](#)
- Royal College of Physicians Sentinel Stroke National Audit Programme (SSNAP). [Stroke health economics: Cost and cost-effectiveness analysis](#) (2016)

Guidelines

- Royal College of Physicians. [National clinical guideline for stroke](#) (October 2016)
- Royal College of Paediatrics and Child Health (RCPCH) guideline: [Stroke in childhood – clinical guideline for diagnosis, management and rehabilitation](#)

Case studies

- [Long Term Plan case studies](#) demonstrating how partnership work with the Stroke Association is improving care and support for stroke survivors
- [7 day rehabilitation service case study](#) from Torbay and Southern Devon Health and Care NHS Trust
- [Achieving successful system change](#) – Lessons from stroke reconfiguration in London and Greater Manchester
- [Greater Manchester Stroke Operational Delivery Network](#)

The Stroke Association

- The Stroke Association. [Current, future and avoidable costs of stroke in the UK](#)
- The Stroke Association. [State of the Nation 2018](#) (February 2018)
- [The Stroke Association website supporting the Long Term Plan](#)

Evidence across the stroke pathway

An evidence review was completed by King's College London for NHS England and NHS Improvement. Its findings are summarised 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, dyslipidaemia and AF.
- 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 AF, and continuing improvements in control of vascular risk factors.
- Programmes such as the NHS Health Check Programme have succeeded in reducing smoking and increasing statin prescription, but as yet there is no evidence of clinically meaningful reductions in other risk factors, eg hypertension, in participants.

Pre-hospital admission management of stroke

- Acute stroke treatments are time sensitive. Increasing stroke awareness so that people are better informed to recognise and respond to stroke symptoms by calling 999 would likely increase the proportion of ischaemic 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. Their reorganisation into a smaller number of highly specialised hyper-acute stroke units in the densely populated metropolitan areas of London and Greater Manchester has proved cost-effective and improved patient outcomes.
- There are workforce shortages. Reorganisation of services in urban areas might improve the efficiency of 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 stroke workforce to increase. Focus on cross-specialty 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 in the first few months after a TIA is about 10%. Furthermore, 5% will die due to a subsequent stroke within the first six 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 six hours of the onset of a proximal large vessel occlusion in the anterior circulation. Disability is reduced in one in 2.6 patients undergoing mechanical thrombectomy and one in five achieve functional independence.
- Urgent management of ICH by tight blood pressure control and reversal of anticoagulation improves outcomes.

Acute care in the stroke unit (after immediate interventions)

- People who have recently had a stroke are likely to have acute care needs 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.
- An MDT-based approach is required to determine the correct pathway for onward care.

Rehabilitation in hospital

- There is strong evidence that a co-ordinated MDT approach including rehabilitation reduces death, institutionalisation and dependency.
- Current UK guidelines recommend 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 shows improvements towards this target, particularly via seven-day working.
- Despite the advances, stroke survivors and their families still perceive services as falling 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 their symptoms, levels of disability and individual circumstances. The National Stroke Programme supports the implementation of integrated ESD and community stroke neurorehabilitation 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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This publication can be made available in a number of other formats on request.

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The bottom half of the page features a large, abstract graphic composed of several overlapping triangular and quadrilateral shapes in various shades of blue, ranging from a deep navy blue to a bright sky blue.