



Unlocking potential: a bold vision for stroke care in England

Stroke
Association

Finding **strength** through **support**



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Foreword

By 2035, the number of stroke survivors in England is expected to double.

Many will be living with long-term disability, unable to live independently and to return to work, whilst incurring long-term healthcare costs. The majority will also be experiencing additional complex long-term conditions. Without urgent action on stroke, the Government's 2035 goal, which is to reduce deaths from heart attacks and strokes by 25%, will not be met. Therefore, over the next decade, we have a collective and powerful mandate to act decisively and ambitiously.

Change is not only possible – it is imperative. The rising number of first-time strokes, the increasing prevalence of recurrent strokes, and the alarming surge among younger people of working age demands urgent action. Yet as daunting as these challenges appear, the path to a better future for stroke care is within our grasp. Based on our consultation with healthcare professionals and stroke survivors, this report showcases the existing foundations that can be developed into a care pathway which will allow stroke survivors to make the best possible recovery and reduce their chance of having another stroke, by 2035, and beyond.

Stroke incidence is climbing, driven by factors including an ageing population, modifiable lifestyle risks such as smoking, and related conditions such as high blood pressure, atrial fibrillation, and diabetes. Even with huge improvements in lifestyle and management of risks, prevention alone will not be enough as an ageing population will for the foreseeable future mean more strokes.

The future stroke pathway must be robust, person-centred, and designed to manage the increasing burden of the condition effectively. It must go beyond addressing immediate health crises to ensuring equitable recovery and long-term support for every stroke survivor.

Major advances in stroke care have already taken place. Integrated Stroke Delivery Networks (stroke clinical networks) drive care delivery, quality improvement and reduce health inequalities. We have a diverse and talented multi-professional workforce complemented by the Voluntary, Community, and Social Enterprise (VCSE) sector which presents unparalleled opportunities. But these assets must be utilised consistently across all regions. Today's unwarranted variations – whether geographical or demographic – leave too many stroke survivors without access to the care they need. This cannot continue.

When governments invest in stroke prevention, treatment, and rehabilitation, we save lives, improve quality of life, enable people to return to work, and enhance the efficiency of the healthcare system. The well-evidenced solutions are already delivering results in many regions. But to reverse the last decade's decline in standards of care, experiences and outcomes, we must ensure these solutions become the standard for every stroke patient throughout the country.

A fully resourced stroke pathway brings benefits beyond stroke care. Primary and secondary prevention reduce the risk of associated conditions such as dementia and heart disease. Investments in person-centred care ripple across the healthcare system, improving outcomes for countless individuals and improving the lives of families and caregivers. This is not merely an investment in stroke – it is an investment in a healthier future for all, with many of the innovative pathways already being delivered across stroke care being directly transferrable to other conditions.

To achieve this, strong government leadership is essential. Policies must prioritise prevention, leverage digital advancements, and build capacity for community-based care. At the core of this transformation lies the unwavering commitment of our stroke community – a coalition of healthcare professionals, voluntary organisations, and stroke survivors – whose voices have shaped this vision and its proposals. Now is the time for bold action.

With courage and commitment, we can emulate the success of earlier reforms that improved delivery of clot busting drugs (thrombolysis) rates, drastically reduced stroke deaths by 50% in only two decades, and improved care for stroke survivors with massive reductions in the reliance on social care.

As the Government shapes its 10-Year Health Plan for England, we have a once-in-a-generation opportunity to set stroke care on a trajectory toward equity, innovation, and excellence.

Stroke is preventable, treatable, and recoverable. Together, we can ensure a future where every stroke survivor receives the care and support they need to recover and thrive.

Let us act now to build a stroke pathway that truly transforms lives.



Professor Deb Lowe
Medical Director,
Stroke Association

Juliet Bouverie OBE
Chief Executive,
Stroke Association

Introduction

Stroke remains one of the greatest health challenges in England today, with increasing rates of stroke incidence and the associated impact on individuals, their loved ones, and the healthcare system. The UK's population is ageing and there is a growing prevalence of modifiable risk factors for stroke such as obesity and type 2 diabetes.^{1,2} These factors may be linked to a rise in both first-time and recurrent strokes. Alarmingly, strokes are becoming more prevalent among adults under 55, further amplifying the need for urgent action.³

Despite these growing challenges, some areas of stroke care have seen a deterioration over the last decade. The decline is evident in longer waits for emergency care, delayed imaging and diagnosis, and inconsistent access to specialist stroke units. For example, in 2023/24, only 47% of stroke patients were admitted to a stroke unit within four hours of hospital arrival, down from 58% a decade ago.⁴ This reduction in timely care dramatically increases the risk of long-term disability and poor outcomes.

The root causes include the ongoing crisis in accident and emergency (A&E) services and social care, and workforce shortages limiting the establishment of the multidisciplinary teams needed to deliver effective care. These systemic issues are further compounded by a lack of alignment between health and social care, often most severely affecting areas that already have persistent health inequalities.

However, the path forward is not without hope. The early 2000s showed that targeted interventions could substantially reduce stroke deaths. The National Stroke Strategy (2007) provided national leadership and ring-fenced funding for stroke care, which allowed local systems to deliver stroke priorities. The number of people dying from stroke was almost halved (46%) between 1990 to 2010.⁵ By using this as a blueprint and leveraging innovations in prevention, acute care, and rehabilitation, we can continue to transform stroke care in England.

This report sets out a comprehensive, evidence-based approach to addressing the challenges and inequities in stroke care. It outlines opportunities for improvement across the entire stroke pathway, from prevention and early intervention to stroke rehabilitation and life-after-stroke support. The urgency is clear, but so is the potential for transformative change. Now is the time to act.



Report recommendations

Making stroke a priority

To meet the Government's 2035 commitment to reduce stroke and cardiovascular disease (CVD) deaths by 25%, stroke survivors, healthcare professionals, researchers and leaders within the stroke community want to see stroke care prioritised in the 10-Year Health Plan and beyond.

This means:



Delivering the essentials for high-quality stroke care, including raising standards in urgent and emergency care, acute care and community-based stroke rehabilitation across England.



Developing a clear and actionable road map for stroke, setting out how Government will deliver its health mission goal to cut stroke and CVD deaths by 25% by 2035. This goal should be expanded to include a 25% reduction in disability, which will benefit stroke survivors, the NHS and the wider economy.



Putting in place a dedicated team to lead on Stroke within the Department of Health and Social Care.



Continued funding for Integrated Stroke Delivery Networks (ISDNs) to enable them to deliver national stroke guidelines and build the workforce needed to transform stroke care.

The following recommendations from the stroke community are grouped under the Government's three strategic shifts: **from sickness to prevention, from analogue to digital care** and **from hospital to community**. Many of these interventions require upfront investment, but they will generate savings for the NHS and the wider economy while reducing the impact of stroke on individuals.



Shift 1: from sickness to prevention

Recommendations:

1. As part of the roadmap for stroke, the Department of Health and Social Care (DHSC) should publish a funded prevention plan, covering shared risk factors for stroke, heart attack and dementia, that would:
 - **Optimise the detection and management of conditions which carry a high risk of stroke**, including high blood pressure, atrial fibrillation (AF), cholesterol and support the reduction of other modifiable risk factors, such as smoking, alcohol and obesity.
 - **Expand detection and management of high blood pressure:** The single largest risk factor for stroke, high blood pressure contributes to 50% of strokes.⁶
 - **Optimise the management of the heart condition AF** to improve compliance with direct oral anticoagulants (DOACs) to reduce the risk of stroke.
 - **Increase uptake of NHS Health Checks:** Transform NHS Health Checks to improve screening for high-risk individuals and provide lifestyle support.
 - **Targeted support for underserved communities:** Reduce health inequalities and the number of strokes in the most deprived areas of the country through targeted stroke prevention activity.



Impact:

Early management prevents future strokes and related health complications, allowing people to live well. **Every stroke that is prevented saves £46,000 in healthcare costs over five years.**⁷



Shift 2: from analogue to digital

Recommendations:

1. The Government must support the delivery of universal 24/7 access to acute stroke treatments, such as thrombectomy and thrombolysis by:
 - **Ensuring pre-hospital video triage is adopted universally:** to speed up diagnosis, access to a stroke unit, alleviate A&E and acute pressures and maximise the benefits of stroke treatments.
 - **Ensuring all stroke patients have access to stroke specialist units and are scanned according to the National Optimal Stroke Imaging Pathway (NOSIP)** to deliver better outcomes.



Impact:

Reduces unnecessary hospital visits and improves access to thrombolysis and thrombectomy. **Thrombectomy saves £47,000 per patient over five years.⁸ For every 2,000 eligible patients who do not receive thrombolysis each year, £8.2 million is incurred in avoidable costs to the NHS over five years.⁹**

2. **Expanding the use of virtual rehabilitation**, a proven intervention within the rehabilitation pathway and digitally enhanced life after stroke pathways, where evidence suggests scalability.



Impact:

Programmes like NeuroRehabilitation OnLine (NROL) have demonstrated positive outcomes for stroke survivors. Less than a third of community-based rehabilitation teams meet recommended staffing levels therefore investment in rehabilitation programmes is essential for stroke survivors' recovery and regaining independence.



Shift 3: from hospital to community

Recommendations:

1. The Government must prioritise and invest in support for survivors after their stroke in line with national guidelines, recognising that the impact of stroke is different for every person. This includes:
 - **Universal adoption of Early Supported Discharge**, through delivery of the Integrated Community Stroke Service (ICSS) model, supporting ongoing needs-based stroke rehabilitation in peoples' own homes.
 - **Every stroke survivor being offered a six-month review and given access to a stroke key worker.** Reviews must provide holistic assessments of stroke survivors' physical, emotional, and social needs. The voluntary sector are well-placed to partner with the NHS to deliver high-quality life after stroke support.



Impact:

Around two-thirds of stroke survivors leave hospital with some form of disability.^{10,11} Not only does good rehabilitation lead to a healthier and a happier population, but it also reduces pressure on the social care system and increases the number of working age stroke survivors and their carers who can re-enter meaningful employment.^{12,13} Good quality rehabilitation and life after stroke support, would help to boost the labour force, at a time when record numbers of people are out of work due to long-term illness.



Part 1: the problem

While advances in stroke treatment and care over the last two decades have improved outcomes for many stroke survivors, critical gaps and inequity of access are jeopardising lives and long-term recoveries.

The growing burden of stroke

The UK population is ageing rapidly, with the number of people aged 80 and over projected to grow significantly over the next 40 years.¹⁴ By 2035, two-thirds of adults over 65 are expected to live with multiple health conditions, including stroke.¹⁵ Smoking, poor diet, harmful alcohol use and sedentary lifestyles are associated with this rise, placing additional pressure on an already overstretched health and care system.¹⁶ Without concerted focus and investment in stroke the impact and burden of the condition will continue to grow, largely driven by an ageing population.

Stroke is the fourth biggest killer in the UK and a leading cause of adult disability.^{17,18} Currently, there are 1.3 million stroke survivors in the UK, and this number is projected to rise by 60% to 2.1 million by 2035.^{19,20}

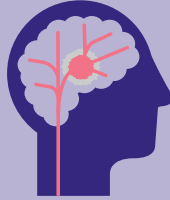
Every stroke is unique, and the impacts are wide and varied; from physical disability to speech and communication difficulties, to struggling with everyday tasks.²¹ Stroke has many hidden effects too; many stroke survivors experience problems with thinking, fatigue and depression.²²

Beyond the devastating impact to stroke survivors and their families, stroke places immense pressure on the economy and the health and social care system, with one in four strokes occurring in working age people.²³ The fastest-growing group for stroke incidence is people under 55, and the loss of productivity associated with stroke costs the UK economy £1.6 billion annually.²⁴ In 2035, the societal costs of stroke to the Government will be £75 billion; an increase of 194% over 20 years.²⁵

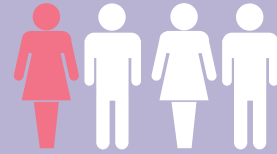
Key statistics



Stroke strikes every **five** minutes.



100,000 people have strokes each year.



1 in **4** stroke survivors will have another stroke within five years.



One third

of survivors have **aphasia**, a language and communication disability that can affect someone's ability to speak, read, write and understand language.



1 in **4** strokes occur in people of working age.



Approximately

60%

of stroke patients leave hospital with a **disability**.



1 in **7** stroke patients die in hospital.



42%

of stroke survivors struggle with **day-to-day activities**, significantly impacting their **independence**.



9 in 10

stroke survivors experience at least **one cognitive impact**. **Three quarters** of stroke survivors experience a change in their **mental health**.

Stroke does not affect everyone equally. Research shows that stroke patients from the **lowest socioeconomic groups** have their first stroke a median of **7 years** earlier than those from the highest.



The fastest rising group for stroke incidence is people **under 55**.



In 2035, the societal costs of stroke to the Government will be **£75 billion**, an increase of **194%** over **20 years**.

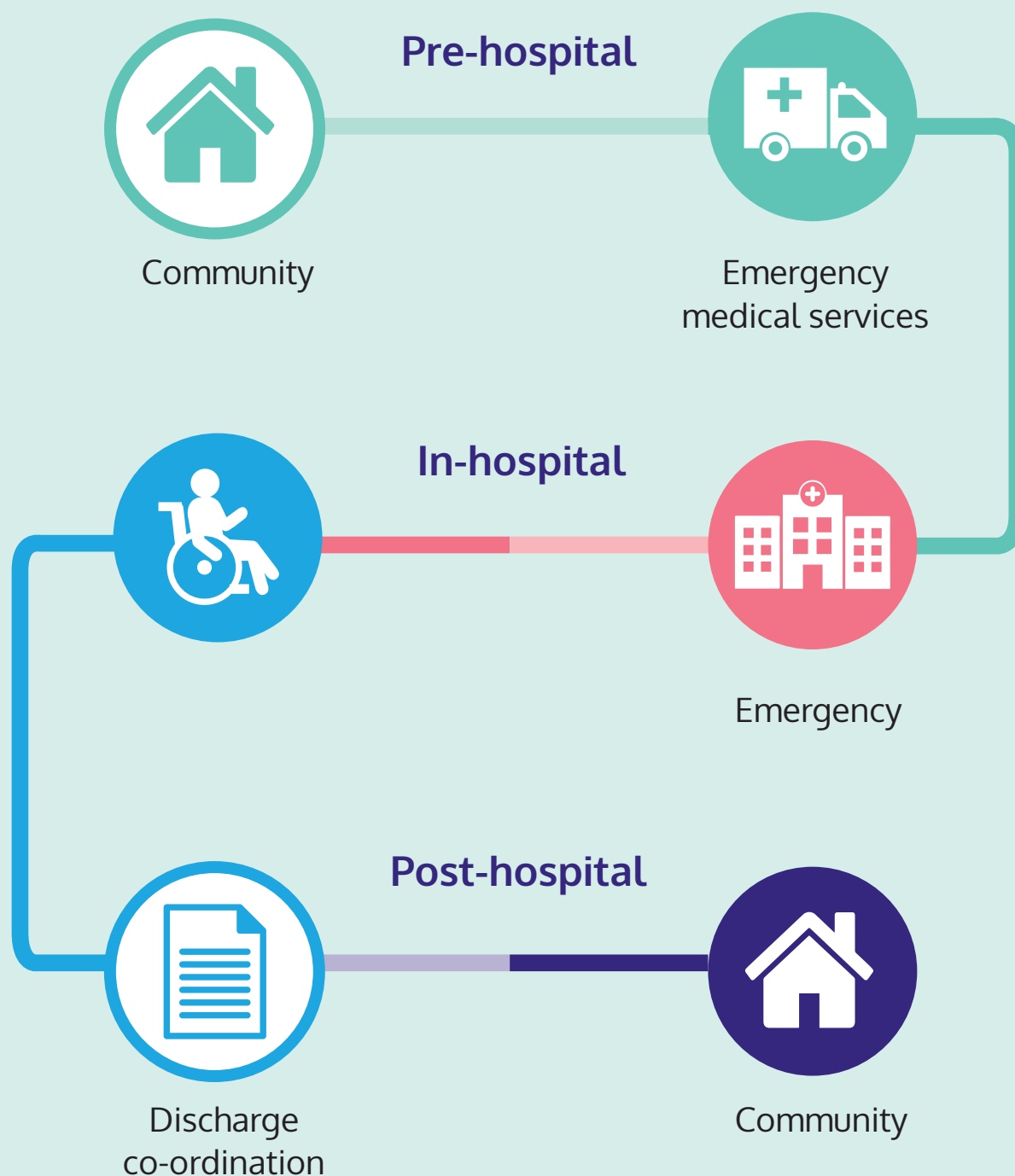


By 2035, two-thirds of adults **over 65** are expected to live with multiple health conditions, including **stroke**.

'The UK population is ageing – which means that stroke is a demographic time-bomb.'

Professor Martin James, Clinical Director of National Stroke Audit (SSNAP),
Stroke Physician, Royal Devon & Exeter Hospital University

The stroke pathway: critical challenges





While every stroke survivor's needs differ, typically, they will use services across the entire health and care system: from **primary care** management of high-risk conditions, to **ambulance and emergency services** after they experience stroke symptoms, to acute care where they can be diagnosed, treated and receive initial rehabilitation and support. However, a stroke survivors' recovery doesn't end when discharged from hospital.

Many will need **community rehabilitation** to help them to regain their movement, speech and ability to carry out everyday tasks. As well as **life after stroke support**, to prevent another stroke, and to support them to thrive and live independently.



Long waits for care and declining standards

Long ambulance waits, handover delays and a lack of imaging capability for diagnostic testing delay patients' access to specialist stroke units and time-sensitive treatments.

In **2023-24**, **only 47%** of patients were directly admitted to a specialist stroke unit within the **target** of four hours arrival at hospital, compared with **58%** in **2013-14**.³¹ Extra time spent waiting for specialist care dramatically increases the risk of long-term poor health and disabilities.³²

During 2021-22 the percentage of 'first class' and 'good or excellent' (A and B) services fell substantially.³³

Postcode lottery in access to treatment and rehabilitation

Where you live should not impact your quality of life after a stroke, yet this is the reality for too many people in England today.

Access to thrombolysis and thrombectomy

Thrombolysis is a brain saving drug that breaks down the clot and returns the blood supply to your brain. In most cases, it needs to be administered within four and a half hours of a stroke.³⁴

Twenty percent of stroke patients could benefit from thrombolysis, however in 2023/24, a national average of 11.6% of stroke patients received it.^{35,36} There is wide variation in rates of thrombolysis across the country – in the East of England thrombolysis rates were 13.82% and in the Midlands were 10.09% in 2023/24.³⁷

Thrombectomy is a surgical procedure typically performed by an interventional neuroradiologist (INR), to remove the blood clot and is often done after thrombolysis.³⁸

It is highly effective and, in some patients, can change the course of recovery from stroke in an instant, significantly reducing the chance of disabilities like paralysis, visual impairment and communication difficulties.³⁹ Thrombectomy is most effective the sooner it's performed following a stroke. It is normally most effective up to six hours after symptoms start.⁴⁰

Whilst improvements have been made, the current thrombectomy rate is still only 4.2%, less than half the existing 2019 NHS Long Term Plan target and significant regional variation means there are inequalities in outcomes for stroke patients. In London for example, 10.3% of patients received a thrombectomy whilst in the East of England, only 1.1% of stroke patients underwent this potentially life-saving treatment.⁴¹



For every **10** minutes of delay, thrombectomy has a **1%** reduction in chance of patient benefit.⁴²

'Thrombectomy is the most effective acute intervention post stroke – you see immediate improvements. It has the potential to offset years of disability. The challenge is to get the whole pathway right to deliver thrombectomy optimally.'

Matthew Fagg, Director of Prevention and Long-Term Conditions, NHS England

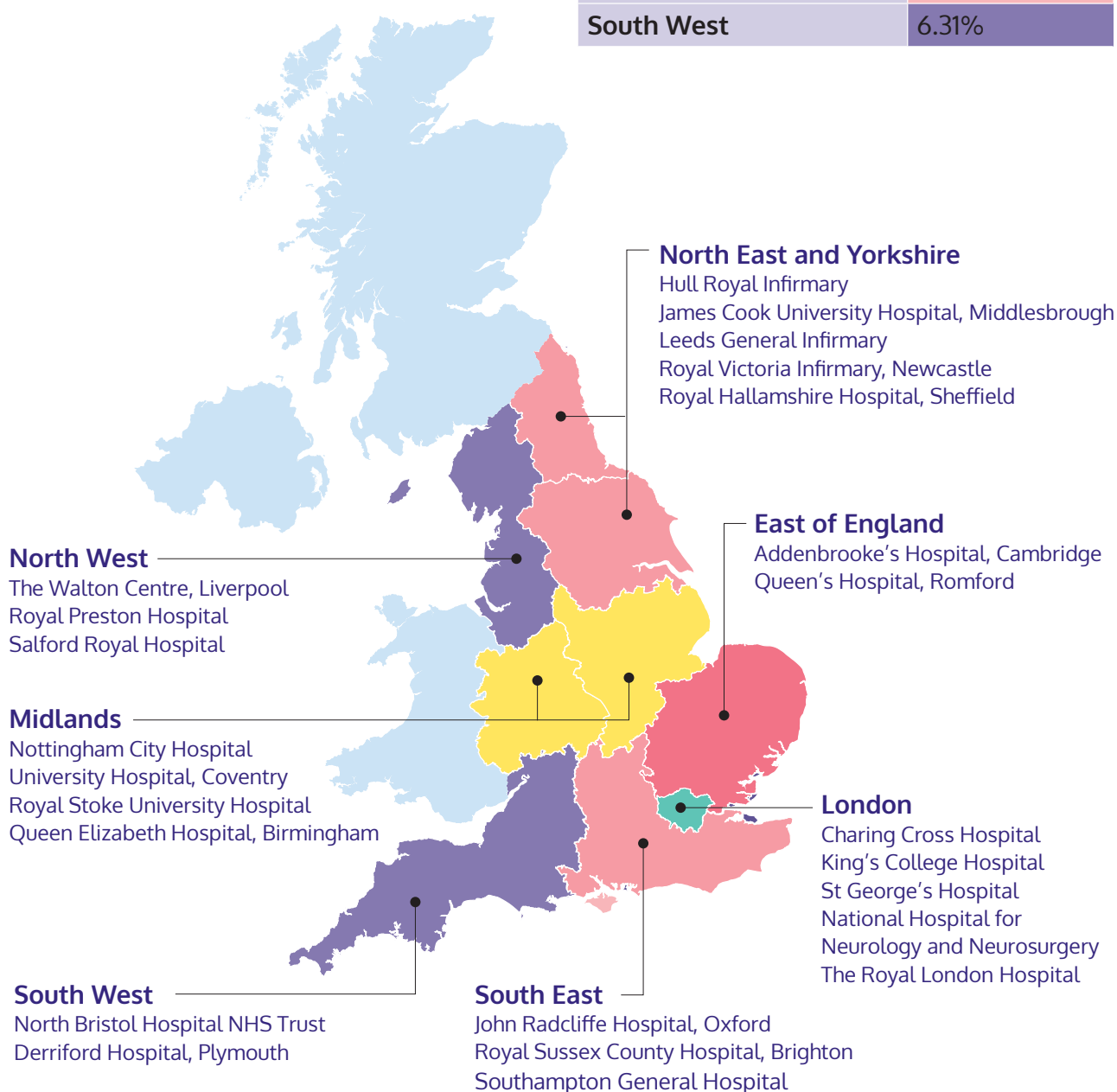


Map of thrombectomy rates

Thrombectomy rates across England April 2023 - March 2024

Some stroke units have agreed pathway arrangements so that patients may receive a thrombectomy in a different region. For example, the East of England regularly transfers patients to London. These patients would be included in London's percentage.

Locality	Treatment rate
East of England	1.11%
London	10.31%
Midlands	3.45%
North East and Yorkshire	2.28%
North West	4.80%
South East	3.55%
South West	6.31%





Community rehabilitation and life after stroke provision

Recovery does not end when someone is discharged from hospital; for many stroke survivors, it really starts when they return home. Stroke survivors may need support to re-learn to walk, regain their speech and to carry out everyday tasks. This will require physiotherapy, occupational therapy, speech and language therapy and psychological support. However, far too many stroke survivors are missing out on community-based rehabilitation, which can stall their recoveries and leave many with long-term disabilities. **Only 17% of community-based services have appropriate access to each core therapy: physiotherapy, speech and language therapy and occupational therapy.**⁴³

The needs of stroke survivors and their families are often complex and constantly change during their recovery. Therefore, it's vital they receive regular reviews, including at six weeks, six months and annually following their stroke. Six-month reviews offer a holistic assessment of a stroke survivor's needs and are critical for tailoring recovery plans and reducing the risk of recurrent stroke. Importantly they can be delivered by non-medical trained experts in the community. **However, just 39% of eligible stroke survivors, received a six-month review in 2023-24, meaning over 42,000 individuals missed out on the support they need to continue their recovery that year.**⁴⁴



Part 2: the vision

The stroke pathway of 2035

Imagine a future where every stroke survivor and their family receive world-class, seamlessly coordinated care – where every step, from prevention to rehabilitation, is designed to maximise recovery and quality of life. This is the stroke pathway of 2035: a bold, innovative system that ensures no one is left behind.

We know this future is within reach because it is already taking shape in pioneering pockets across the country. With decisive Government action – through sustained investment, commitment to cutting-edge research, and the scaling up of proven innovations – we can transform these isolated successes into a national standard.

Stroke care has the potential to be not just effective, but extraordinary. With the right leadership and ambition, we can create a system where every survivor thrives, not just survives.

A patient-centred journey: what care could look like by 2035

Some of the latest innovations in stroke care are showcased below. If these were accessible across England, we could radically reduce stroke and the impact of stroke.

1. Preventing the preventable

By 2035, proactive primary prevention will be the foundation of stroke care. Technology-enabled GP practices will provide comprehensive management of stroke risk factors like AF, high blood pressure, and high cholesterol, combined with tools and technology including wearable devices, to help people make lifestyle changes. Community health initiatives will empower individuals to take charge of their health, going some way towards a 25% reduction in stroke incidence. These efforts will not only save lives but also enhance quality of life, adding years of good health for countless people.

Using tech solutions to screen for stroke risk factors



Supermarket/hypermarket opportunistic screening for AF (SHOPS-AF) using sensors embedded in supermarket trolleys.

In the north west of England, shopping trolleys were fitted single-lead electrocardiogram sensors in four supermarkets to detect an irregular pulse. If an irregular pulse was found, the participant had a follow-up with a pharmacist who would check their pulse and carry out another test. All the participants received their results and if AF was confirmed they had a cardiologist appointment within two weeks for further treatment.⁴⁵

This study is an example of using technology to assist with screening the general public for stroke risk factors in a non-health setting, trying to make it part of their daily routine.

2. Rapid, precise acute care

The stroke pathway of 2035 imagines a system where every second counts. Pre-hospital video triage will connect all ambulance teams with stroke specialists to ensure that patients are directed to the right place at the right time. State-of-the-art point-of-care testing and improved paramedic triage in ambulances will support more immediate diagnosis, this will ensure that stroke patients get interventions even faster and are transported to the most appropriate health setting.

Rapid assessments will take place within minutes of arrival, with specialist immediate assessment, advanced imaging and AI-assisted diagnostics. Multidisciplinary stroke teams will deliver evidence-based treatments like thrombectomy and thrombolysis within the critical treatment window, dramatically improving outcomes and reducing disability. Those elements are already present in many stroke services but need to be sustainably funded and staffed.



Spotlight on Stroke Association research: **GHoSt: developing a lateral flow test for strokes**

The symptoms of stroke could also be caused by many other conditions like seizures, migraines and sepsis. At least a third of emergency ambulance calls for suspected stroke turn out not to be strokes at all, but can only be determined with expert clinical review. A brain scan is often needed to diagnose and treat stroke, which is why there is considerable research focus on quickly identifying strokes. The team have already created a test which can tell with 95% accuracy within 10 minutes whether a patient is concussed and now hope to have the same success in developing a test for stroke.

The GHoSt team want to create a lateral flow test that can rapidly tell paramedics and other healthcare professionals if a patient is having a stroke before a brain scan has taken place. Stroke units could be notified ahead of time that a patient is on the way. Therefore, giving them advanced warning and reducing time for brain saving treatment to be given. The GHoSt team hope that their test will be able to tell the difference between a stroke caused by a clot and one caused by a bleed.⁴⁶ If successful, GHoSt could dramatically alter hyperacute care by making it possible to tell, without the need for a brain scan, whether a patient is having a stroke and potentially enabling them to start treatment before they arrive at hospital.

GHoSt is led by Tony Belli, Professor of Trauma Neurosurgery at the University of Birmingham and an Honorary Consultant Neurosurgeon at Queen Elizabeth Hospital in Birmingham.

3. World-class rehabilitation in the community

Rehabilitation is recognised as a critical component of stroke recovery. Community rehabilitation will integrate with social care and the VCSE sector, delivering personalised rehabilitation and life after stroke support in the comfort of stroke survivors' own homes.

Integrated teams of professionals and volunteers will ensure survivors regain mobility, independence in tasks of daily living, psychological health, improved communication and swallowing, and ultimately wellness, wellbeing and confidence to return to living well post stroke. They will also support with improved psychological health, well-being and confidence, so stroke survivors return to living well. These services are already being delivered successfully in some parts of the country, with teams working together across boundaries, organisations and becoming greater than the sum of their parts.



4. Long-term holistic support care

By 2035, stroke survivors will no longer feel abandoned after hospital discharge. Universal holistic reviews will address not only physical recovery but also psychological and social needs, including support for anxiety, depression, pain management, and return to work. Community hubs, digital rehabilitation platforms, and peer support networks will create a safety net, empowering survivors to lead fulfilling lives.



Spotlight on Stroke Association research

WATERs-2: Making mental health support accessible and inclusive for more stroke survivors.

Up to three quarters of stroke survivors experience challenges with their mental health, ranging from anxiety to suicidal thoughts.⁴⁷ At the moment, options for support with mental health after stroke are limited.⁴⁸

However, there are lots of promising new therapies which could help, including Acceptance and Commitment Therapy (ACT), which focuses on accepting and adjusting to your feelings and committing to doing things that align with your personal goals. The WATERs-2 team are looking at how to make ACT more inclusive and useful for people belonging to ethnic minorities and people with aphasia, both groups who are often excluded from mental health research.

ACT is one of a number of promising new therapies that could help support mental health after stroke, but these therapies are not yet widely available. The WATERs-2 team hope to create a network of ACT experts across the UK who can train and support other stroke professionals to deliver ACT. This would mean that more people affected by stroke are able to access genuinely helpful mental health support.

WATERs-2 is co-led by Dr Emma Patchwood, Postdoctoral Research Associate, and Audrey Bowen, Professor of Neurological Rehabilitation, both at the University of Manchester.



Part 3: the journey to 2035

How we reached our findings

In Autumn 2024, the Stroke Association asked stroke survivors, professionals, researchers, and senior NHS leaders across England to name their top priorities for improving stroke prevention, treatment and care, and to outline the main barriers to progress in these areas. (See **appendix** for more details).

Our engagement activities consisted of five roundtables, including a stroke survivor focus group as well as a survey of stroke professionals. In total we reached over 350 members of the stroke community.

The **three areas** that the engagement exercises covered were designed to mirror DHSC's approach to the 10-Year Health Plan.



1. Sickness to prevention

How can we move from treating illness to preventing strokes altogether?



2. Analogue to digital

How can technology and digital solutions improve stroke care quality and speed?



3. Hospital to community care

What investments are needed to strengthen community-based, person-centred recovery?

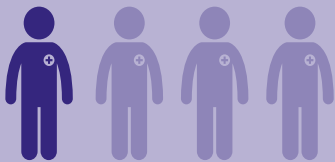
Stroke is **preventable**



Shift 1: **moving from sickness to prevention**

The stroke community consistently emphasised the need for preventing strokes, and conditions which increase stroke risks, to play a much more prominent part in national and local programmes.

With nearly 90% of strokes linked to modifiable risk factors, participants highlighted the potential for comprehensive screening programmes, public awareness campaigns, and targeted interventions to address these factors.



1 in 4 healthcare professionals said **targeted screening programmes** are the single most effective intervention that would cut stroke death and disability.⁴⁹

‘The best thing for a patient is to prevent them having a stroke in the first place.’

Matthew Fagg, Director of Prevention and Long-Term Conditions,
NHS England



Priorities from the stroke community

- **Public and professional awareness of stroke** and its prevention remains low, despite the success of the Act FAST (Face, Arms, Speech, Time) campaign.
- Many prevention activities lack a **joined-up, person-centred approach**. Screening checks are carried out by multiple primary care professionals, with no-one having an overview of the 'whole person'.
- **High-risk groups are frequently overlooked**, exacerbating health inequalities due to limited outreach and inadequate community prevention services, such as smoking cessation and exercise programmes.
- **Infrastructure challenges**, including poor data systems and insufficient funding, further hinder the delivery of comprehensive prevention programmes. These systemic gaps leave many individuals who are at high-risk of stroke, undiagnosed or poorly managed.

A stroke survivor reflected the urgency of these challenges, stating: 'Stroke isn't taken seriously enough. It changes your life.'

What needs to change

To enhance stroke prevention efforts, the stroke community identified the following priority actions:

- 1. Investment in targeted screening programmes:** Nearly all healthcare professionals (98%) emphasised the importance of enhanced screening to prevent strokes or recurrent strokes, with one in four identifying it as the top intervention to reduce stroke-related death and disability. Screening for AF, blood pressure, and cholesterol should be expanded and integrated with other risk factor assessments. This is key to preventing strokes, as well as other health conditions.
- 2. Holistic, integrated approaches:** Current management of high-risk conditions is often siloed, requiring better collaboration across services. Integrated, person-centred care, with support from social prescribers and link workers is essential to improve outcomes and ensure that prevention efforts are effective and accessible to all.
- 3. Innovative ways to engage people in managing their health:** Increasing the uptake of NHS Health Checks and training healthcare professionals to "make every contact count" would significantly improve early diagnosis, patient adherence to treatment, and risk factor management. Screening programmes should be designed to engage with high-risk and hardly reached communities in a meaningful way. Strategies including locating clinics in areas of high deprivation and screening people in non-clinical settings e.g. supermarkets, community hubs, or the workplace.
- 4. Infrastructure and funding support:** Enhanced data systems between community services, such as pharmacy and general practice. For example, allowing data from community pharmacy services to be integrated and automatically updated into the GP patient record to allow for a more cohesive approach and the better management of conditions such as high blood pressure.
- 5. Sustained long-term funding and staffing:** are also vital to scaling up stroke prevention programmes and addressing current gaps in outreach and service delivery.



Adopting a population health approach could identify those most at risk of stroke more rapidly and effectively. People who have a high risk of stroke should routinely receive support and information, so they understand the importance of adhering to medication or adopting life-style changes that help them manage their stroke risk for example, managing their blood pressure, stopping smoking, exercising regularly, eating healthily and managing their weight. It's also vital, that stroke survivors receive ongoing support and information, to prevent them having future strokes.⁵⁰

AF can also increase your risk of a second ischemic stroke by around eight times.⁵¹ According to the Stroke Association's Patient Reported Experience Measures Survey (PREMS), 25% of respondents weren't offered advice and support to monitor their blood pressure independently but would have liked to have been.⁵²

'Promoting life-style management and preventative measures such as reducing smoking, alcohol and leading healthy lives need more investment.'

Stroke survivor

The Cardiovascular Disease Prevention Audit (CVDPREVENT)

CVDPREVENT is a national audit to support prevention of conditions such as strokes.⁵³ The data, extracted from GP systems, helps local and national systems understand if people are being undiagnosed or under treated for risk factors such as atrial fibrillation, high blood pressure and high cholesterol. The annual audit reports can be used to support quality improvement, reduce health inequalities and to improve health outcomes for populations at practice, system and national level. One of the key findings from the 2024 audit highlighted that the national ambition to treat 77% of patients in line with the national hypertension target wasn't being met.⁵⁴ ICSs can drill down into the data to compare their performance to national targets, to improve the detection and management of stroke risk factors.

Recently, CVDPREVENT audit data has looked at stroke deaths in patients with CVD, finding that stroke deaths in the black ethnic group was higher than all other ethnic groups.⁵⁵ This sophisticated data enables local systems to investigate and design targeted support programmes to enable people to better manage their health.

Charities like the Stroke Association are uniquely positioned to complement NHS efforts, delivering targeted interventions in communities. By providing tailored support and information, our sector bridges gaps in healthcare delivery, empowering individuals to take proactive steps to reduce their stroke risk while addressing health inequalities. Through investment, integration, and partnerships with the VCSE sector, the healthcare system can significantly reduce the incidence and impact of stroke, saving lives and improving outcomes for those at risk.

The Stroke Association has several services to support stroke survivors and their families and carers.



Stroke Support Co-ordinators are based in local communities and provide one-to-one tailored support to stroke survivors, carers and their families throughout their recovery journey. They also provide guidance to help prevent stroke survivors having another stroke.



Stroke Support Helpline is a national helpline providing guidance, emotional support and practical information for anyone affected by stroke. It's backed up by our website information and peer support forums.

Coventry and Warwickshire:

Rapid access community atrial fibrillation (AF) one-stop clinic



In Coventry and Warwickshire, a pioneering one-year AF project led by **Dr. Sandeep Panikker**, Consultant Cardiologist and Electrophysiologist, is revolutionising care for patients with AF by improving stroke prevention and dramatically reducing waiting times for cardiology appointments from four to six months to under two weeks. The project features a one-stop clinic where patients have a heart ultrasound (echocardiogram) and are then reviewed by a specialist AF nurse.

This service is in North Warwickshire, an area with significant deprivation, and prioritises engagement with underserved groups, including those for whom English is not their first language. The project demonstrates how targeted screening and community-centred care can address health inequalities and improve stroke prevention.

'The project features a one-stop clinic where patients have an echocardiogram and are then reviewed by a specialist AF nurse. We assess multiple risk factors for stroke, at the same time, and look at ways to manage them. Patients are subsequently supported through a dedicated helpline to assist with medication compliance and to improve their experience of care. Medication compliance is the cornerstone of stroke prevention and can help to avoid hospital admissions and reduce the burden on primary care services.'



Baz Singh (52) a father of five, from Solihull, Birmingham, had a stroke in November 2023.

'In the South Asian community, stroke and heart attacks are unfortunately common. I've had both. The average lifespan of my parent's generation was mid-60s and it's getting worse now. I lost my first cousin, who was like a brother to me, at 56.'

'I think lifestyle factors play a part in this. Growing up I was encouraged to eat salt and 'energy-rich' foods like butter. We didn't know about the risks of drinking alcohol. We also work long hours and have a lot of family responsibilities which can cause stress. All of these factors increase your blood pressure, which can increase the risk of stroke. I think, if you can change one small thing in your life to reduce your risk of stroke, why not try?'

Stroke is **treatable**



Shift 2: **making better use of technology in stroke**

Every minute a stroke remains undiagnosed and untreated results in the death of 1.9 million brain cells, significantly increasing the risk of long-term disability. Digital transformation offers enormous potential to improve the speed, accuracy, and equity of stroke care.



Priorities from the stroke community

- The stroke community emphasised **the critical need for speed in the stroke pathway, as delays at any stage can result in poorer outcomes**. Participants highlighted that the faster these treatments are delivered, the better the chances of survival and recovery.
- **Access to thrombolysis and thrombectomy**
More stroke patients having access to thrombectomy and thrombolysis is the top intervention for 1 in 3 healthcare professionals, to cut stroke death/disability. However, availability is inconsistent across regions, with thrombectomy rates in England continuing to lag behind comparable international healthcare systems.

**'Speed and access equals outcome.
I'm proof of the difference an hour can make.'**

Stroke survivor

The stroke community spoke about the following barriers that are currently getting in the way of delivering thrombolysis and thrombectomy:



Ambulance pressures and delays in getting to hospital and inter-hospital transfers.



Delays diagnosis of stroke.

Increases likelihood of delayed access to specialist stroke unit and thrombectomy centres.



Lack of imaging equipment including scanners that are needed for diagnosis and treatment decisions.



Workforce shortages across the pathway, including nurses and radiographers.



Lack of doctors trained to perform thrombectomy.

Lack of wide-ranging specialist staff who support the delivery of thrombectomy.



Need for better education for workforce, including paramedics.



Problems with patient flow across stroke pathway – e.g. delayed discharges from stroke units, due to lack of social care.



Lack of funding to support improvements in the pathway and delivery of evidence based care.

Greater Manchester:

Stroke awareness in South Asian and Muslim communities



Farheen Akhtar, an Orthoptist and Network Facilitator in the Greater Manchester Neurorehabilitation and ISDN, has worked collaboratively with multiple community-based organisations, including the Diabetic Network, Manchester Metropolitan University, and the British Muslim Heritage Centre to develop an innovative approach to raising stroke awareness in South Asian and Muslim communities.

Recognising the cultural importance of faith in health behaviours and the impact of working with religious leaders to reach underserved communities, the project adapted the FAST (Face, Arms, Speech, Time) test and stroke prevention resources, such as leaflets, to align with verses from religious texts and practices including: the Quran, Hadith and Sunnah.

A stroke survivor from the community talked publicly about stroke to help inform people and inspire them to recognise the risks and change their behaviours. Through collaboration with trusted community leaders, including Imams, the team delivered culturally relevant health messages in the native language in mosques and community centres where people regularly gather.

'The programme resonated deeply with the community, raising awareness of stroke and its risks. Using personal stories showcased the reality of stroke but gave real changes they could make, that aligned with their faith and reminded them of their responsibility. By working collaboratively, we've been able to reach even people in the community, locally and regionally. This model acts as a blueprint for similar culturally driven health interventions in other communities.'



Chloe Hodgkisson (37) had a stroke suddenly when she was away for the Bank holiday with her family and friends in 2024. Chloe was blue-lighted to the John Radcliffe Hospital in Oxford, where she received a thrombectomy. Chloe feels incredibly lucky and has no permanent effects.

'I was in the right place at the right time. I had my stroke at 8.00am on a Sunday. I didn't realise, but I was told if I had been in my home town of Cambridge, the treatment wouldn't have been available out of hours.'

Chloe was in her hotel room when she started to experience stroke symptoms. Within just two hours of her husband calling 999, she was transferred to hospital, diagnosed and had received a life-saving thrombectomy.

'When I woke up from the surgery, I felt instantly better. I remember thinking they've fixed me.'

I could speak, I could see, I could move my arms and legs again, and I could think. I was so relieved to have a conversation with my family and parents again.'

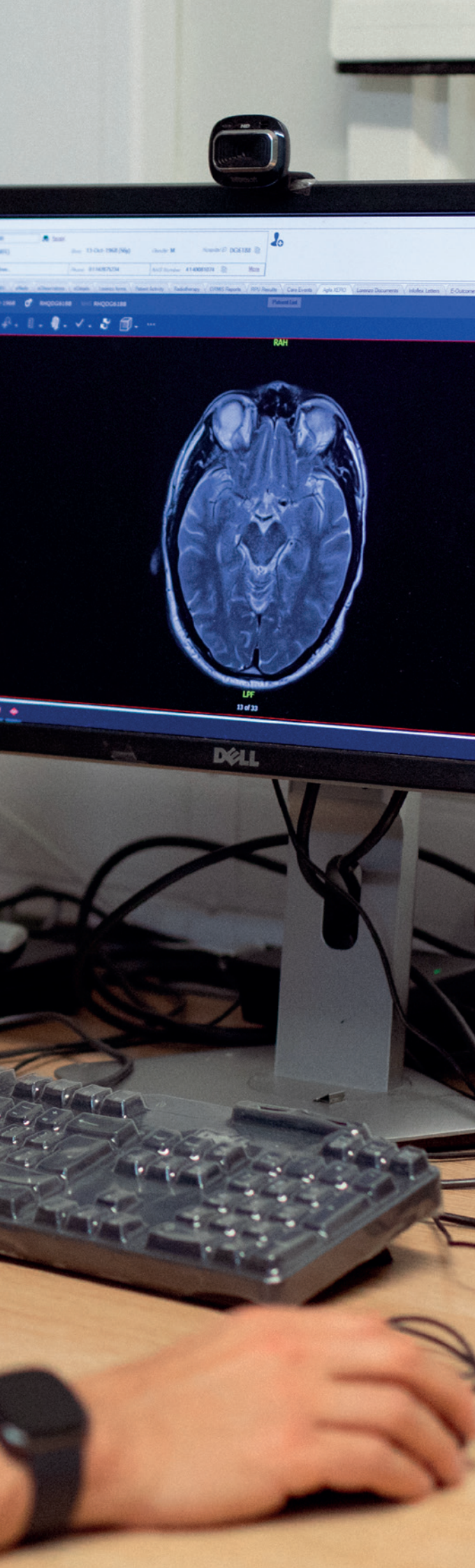
Chloe had her stroke in May 2024, but, thanks to her thrombectomy, is back to her old self. 'I'm back to how I was before my stroke and it hasn't even been a year. I'm a mum of two boys and I'm on the school run and back to family life and work. I'm playing netball, and running again, and in October I completed 100 miles running and walking for the Stroke Association. All of this was only possible because of the success of the thrombectomy and how quickly I got to hospital.'

'A stroke is life-changing. It can happen to anyone and then your life stops. Yet I know so many people are missing out – a thrombectomy is so tremendous and non-invasive. I think everyone should have a fair opportunity to receive one, no matter where they live.'

What needs to change

Participants outlined several changes necessary to improve access to life-saving treatments:

- 1. Pre-hospital video triage:** paramedics are equipped with digital devices to communicate with stroke specialists and triage stroke patients more effectively through shared decision making, ensuring stroke patients can be taken directly to a stroke unit for treatment and care.
- 2. Quick access to brain imaging and a specialist stroke unit:** making sure suspected stroke patients quickly receive a brain scan, means that diagnosis and treatment can happen within the relevant timescales.
- 3. Workforce expansion:** key to patients being able to access treatments like thrombolysis and thrombectomy is having the appropriate specialists and equipment within stroke units available. **96% of healthcare professionals said that the recruitment and retention of additional staff, including Interventional Neuroradiologists (INRs) would improve thrombectomy delivery.**
- 4. Integrated and collaborative leadership:** strong political and clinical leadership is needed to address regional disparities and enhance access to thrombolysis and thrombectomy. ISDNs must be supported and funded to enable coordinated care, workforce planning and development, and patient identification. **Nine in 10 professionals told us more integrated care would improve access to thrombectomy and thrombolysis.**



Pre-hospital video triage

In early 2020 during the first months of the Covid-19 pandemic North Central London and East Kent introduced pre-hospital video triage. Ambulance clinicians communicated with stroke clinicians through smartphones and iPads, allowing doctors and nurses to remotely assess the patient and recommend referral to a stroke unit, A&E or treatment in the community. A rapid review found that services were 'safe, effective and usable.'⁵⁶ Reported benefits have included improved access to stroke units and thrombolysis and thrombectomy.⁵⁷

PHOTONIC: (PreHOspital Triage for potential stroke patients: lessons from systems Implemented in response to Covid-19) includes a focus on the experience of pre-hospital video triage for patients, carers and staff in North Central London, East Kent, Maidstone and Darent Valley. Emerging findings have been mostly positive so far and stroke patients who were transferred directly to a stroke unit felt that services were well prepared for them.⁵⁸



Artificial Intelligence (AI) in stroke care

AI is revolutionising stroke care by enabling faster diagnosis and treatment. AI technology allows brain images to be shared between hospitals in real-time, speeding up decision-making for treatments like thrombectomy.

Studies show that AI integration in stroke care can triple the number of patients recovering well enough to perform daily activities, in one hospital this resulted in increasing from 16% to 48%. AI is now in use across all stroke networks in England.⁵⁹

Stroke is **recoverable**



Shift 3: **moving stroke care into the community**

For most stroke survivors, the bulk of their recovery begins once they leave hospital. However, all too often, support suddenly ends when a stroke survivor leaves hospital, jeopardising their physical and mental recovery.



Priorities from the stroke community

- The stroke community highlighted a critical need to shift care into the community to ensure that survivors have access to ongoing stroke rehabilitation and tailored support. While acute care rightly receives attention and resources, parity of esteem is lacking for rehabilitation and life after stroke support. This imbalance leaves many stroke survivors struggling to recover fully, with long-term impacts on their independence, well-being, and quality of life.



Four out of five stroke survivors reported that they had to pay for their own rehabilitation.

- Many survivors expressed frustration with the lack of tailored support after hospital discharge. One survivor said, **'My aftercare has been non-existent. Each patient needs a personal rehabilitation plan.'** highlighting the abrupt end to support after leaving acute care. The gaps in NHS provided rehabilitation is forcing people to self-fund.



Four out of five stroke survivors said having more rehabilitation is the most important intervention, that would improve recovery after stroke.

- Six-month reviews are another vital support tool after discharge. However, **only 1 in 5 survivors reported having received a review.** The current provision of six-month reviews needs improving because those who did get a review often found the process inadequate. One survivor described it as **‘a tick-box exercise,’** emphasising the need for these reviews to serve as meaningful opportunities to identify and address rehabilitation needs.



Early Supported Discharge (ESD)

This model of delivering high-quality, home-based rehabilitation recommended by national guidance (ICSS model), plays a vital role in joining up care and supporting stroke survivors to recover after stroke. Approximately, 40% of stroke patients are eligible for ESD but support is patchy around England and varies in quality.⁶⁰

In England, in 2023/24, just over half (55%) of stroke patients received ESD, but this varies significantly across the country – whilst in Greater Manchester 83% of patients received ESD, in Kent and Medway just 36% did.

ESD can reduce disability as well as length of stay at hospital. The best results were seen in trials where the ESD team were well co-ordinated. Stroke survivors are also more likely to be independent in daily activities and living at home six months after their stroke.⁶¹



Stroke Association Connect

Stroke Association Connect was set up during the coronavirus (Covid-19) pandemic to help make sure stroke survivors and their families received quicker support after hospital discharge. Newly diagnosed stroke survivors receive an initial call within six weeks of leaving hospital, followed by two additional calls.

In 2024, we made more than 6,200 calls to stroke survivors, providing follow-ups and long-term support after they left hospital. Its popularity with stroke survivors and success has led to us continuing the service, which is regularly reviewed and developed to ensure it meets stroke survivors’ needs.

What needs to **change**

The stroke community highlighted key changes to unlock the potential of services already in place and ensure stroke survivors get the support they need to thrive after stroke:

1. Investing in rehabilitation services

Community services need to be sufficiently resourced to ensure that every stroke survivor receives the right level of specialist rehabilitation, tailored to their individual needs. This includes both face to face stroke specific rehabilitation and also a technology and digital offer including online support, rehabilitation and more generalised digital or virtual support, such as NeuroRehabilitation OnLine (NROL). Workforce gaps also need to be addressed through increased recruitment, retention, and upskilling.

2. Integrating community pathways

Pathway integration is vital for improving post-stroke care. ESD, delivered as part of the national ICSS model, ensures that stroke survivors can access high-quality, multidisciplinary rehabilitation in their homes, while six-month reviews of individual's physical, psychological and social needs, must be standardised and seen as actionable plans for continued recovery.

3. Supporting the VCSE sector

Charities like the Stroke Association play a critical role in delivering community-based services, from group support to six-month reviews. Greater collaboration between local stroke services and community organisations is essential to ensure that survivors do not miss out on support. The value of these services must be recognised and properly funded.

'Six-month reviews need to be a launchpad to help stroke survivors in their recovery.'

Professor Avril Drummond

Professor of Healthcare Research and an occupational therapist, University of Nottingham



Stroke Support Co-ordinators

Kate Rowlson had a stroke, in August 2023 when she was 23. Kate received weekly calls from her support coordinator, which were a 'lifeline' for Kate.

Kate, who is originally from Nottingham, but now lives in Manchester said, 'People think strokes only affect older people. My stroke happened out of the blue and I was in and out of hospital for a year and a half. Some impacts of my stroke are more visible, whilst others are hidden. I had double vision for about a year and half as a result of having third nerve palsy, meaning I had to wear glasses. I have problems with my short-term memory and have really struggled to cope mentally.'

'Ava called me every week to see how I was. I felt so connected to her, she really understood, she listened to my story, she asked questions about stroke. She was the middle ground between my family and friends and doctors, and provided the empathy, support and understanding I needed.'

She also reached out to my parents who were struggling to deal with it all and supported me in meeting other young survivors. She put me in contact with a girl who was 27, who understands what I am going through, we go for dinner every three weeks now, she's about six months ahead of me in her journey and gives me hope. The Stroke Association has been a huge support to me and my family – at a real time of need.'



VCSE support

The Stroke Association provides universal and local support for stroke survivors, as well as funding research projects and people, dedicated leadership support to ISDNs, expertise on pathway redesign and quality improvement and advocating for policy and systems change.

With such limited NHS and social care capacity, thinking differently about long-term support provision is essential. The voluntary sector has decades of experience in delivering care and support based on what matters to people affected by stroke. Long-term support is a vital, yet often overlooked, part of the stroke care pathway.

The VCSE sector provides the information and support that many stroke survivors need through their recovery journey, to reduce their risk of further strokes, help them to regain their independence, and improve their physical and mental wellbeing. With a proper funding package, the sector can be commissioned more widely to provide these services.



Sue McAlpine (61) a fitness instructor from Brentford, collapsed after having a stroke, in March 2023. Sue was rushed to Charing Cross Hospital where she spent 10 days unconscious in a coma. With the support of a physiotherapist, Sue was able to regain her strength and learn how to walk again with right-sided weakness.

'It wasn't until after my recovery, when I spoke to other stroke survivors, I realised that rehab like the physiotherapy I had, depends on where you live. I thought all stroke survivors would get the same level of support that I got. I hear so many stories of people struggling with their recoveries. Your recovery takes a positive mindset – it's really tough, but every stroke survivor should get as much as they need to be able to live their life.'



NeuroRehabilitation Online (NROL)

NeuroRehabilitation Online (NROL) provides online (cognitive, communication, and physical therapy) therapy through video calls to stroke survivors and people living with a neurological condition.

Recommended in National Guidelines, it offers additional rehabilitation, particularly for those who can't attend in-person therapy sessions. Groups are delivered over a six-week programme and people can access up to eight different groups a week to support their ongoing rehabilitation. Technical support is available to make sure that stroke survivors can access the sessions.

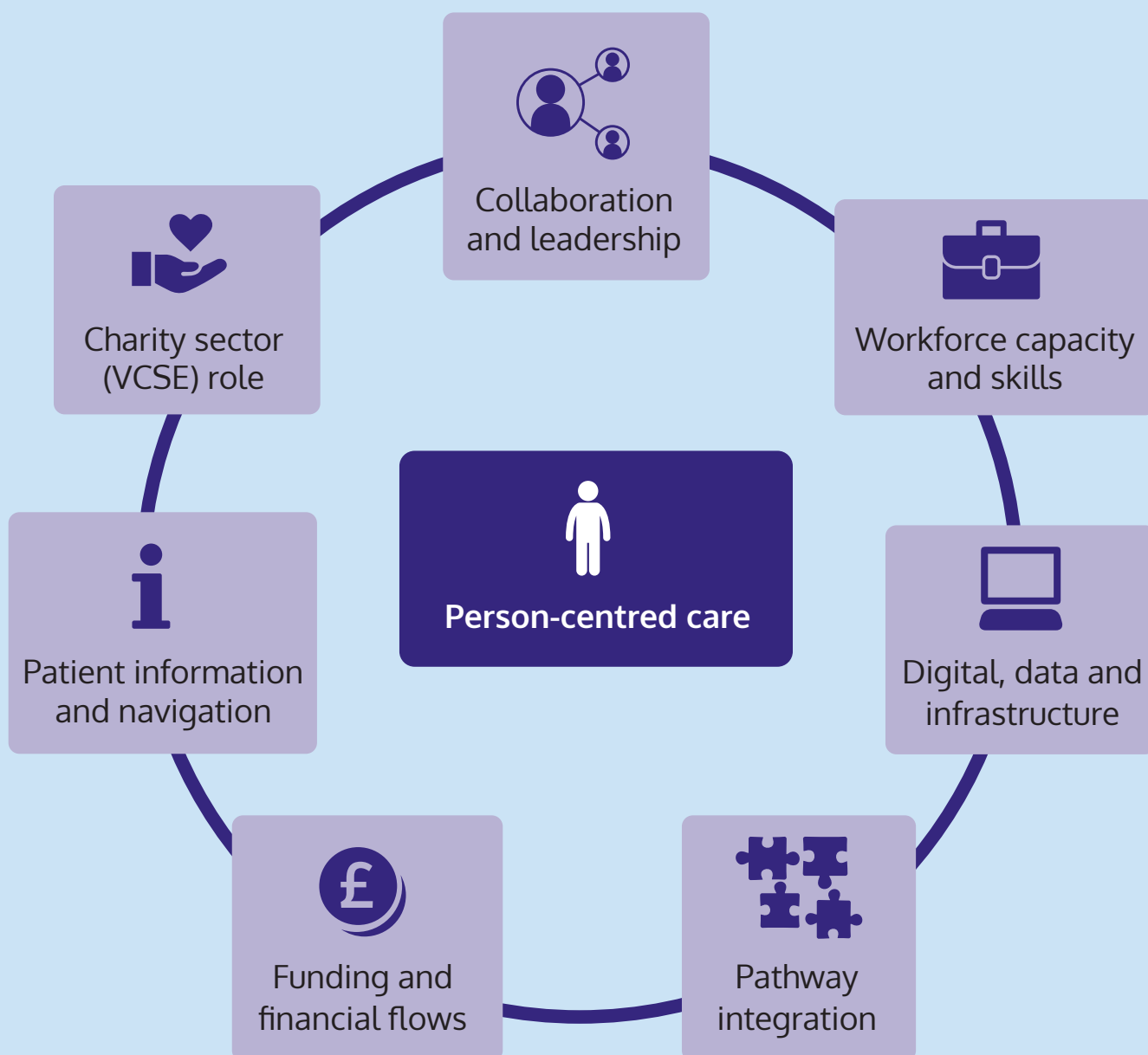
NROL is being delivered in partnership with Integrated Community Stroke teams (including Assistant Practitioners), across Lancashire and South Cumbria.

The programme has been very successful with stroke survivors reporting improved outcomes, including improved physical recovery and better wellbeing. They value having access to rehabilitation from their own home and appreciate the expert advice. Stroke survivors feel a strong sense of peer-support which they've said hugely helps their recovery.



Key enablers for stroke reform

These recommendations rely on enablers to high quality stroke care that cut across all three shifts. The stroke community repeatedly emphasised the following fundamentals to unlock the potential within the pathway. These enablers not only ensure person-centred care but also capitalise on existing successes in the stroke pathway to improve outcomes for stroke survivors nationwide. The foundations for stroke system reform are in place, but progress hinges on Government commitment to addressing these enablers.



Collaboration and leadership

Strong partnership between NHS England, Integrated Care Boards (ICBs), and ISDNs, which connect teams of healthcare professionals and voluntary organisations. Government leadership can ensure consistent funding, expand ISDN capacity and address inequalities.

Workforce capacity and skills

The stroke workforce, including specialised roles in diagnostics, treatment, rehabilitation, and community care, must be expanded and supported to widen access to life-saving stroke treatments and follow-up support.

Digital, data and infrastructure

Expanding technologies like pre-hospital video triage and AI-based imaging in an integrated way across all regions can improve diagnosis and treatment times. Technology that patients use must remain accessible. Stroke's national audit data (SSNAP) is vital to understanding care quality in stroke. It must continue to be funded as a vital tool to improve stroke survivors' experience and outcomes.

Pathway integration

Joining up services across the pathway, in line with national models, is key to delivering person-centred stroke care and achieving universal rollout of innovations, including Early Supported Discharge and six-month post-stroke reviews.

Funding and financial flows

Scaling up stroke innovations such as 24/7 thrombectomy services, and NROL requires sustained, targeted investment but this will generate cost savings and improved patient outcomes. Rethinking financial flows can help incentivise the NHS to engage in more preventative work.

Patient information and health navigation

Empowering stroke survivors and their carers with accessible information and navigation support enhances self-management and recovery outcomes. Community-based staff and volunteers, as well as digital patient portals, can improve engagement and reduce the burden on acute services.

Maximising the use of the VCSE and community organisations

A vibrant and strong VCSE sector is a huge asset to the NHS and local communities and must be supported as partners in the commissioning and delivery of stroke care. Community outreach programmes in many areas are successfully targeting underserved populations and need further Government support.

Appendix: our methodology

Co-design with the stroke community

This report was coproduced with the community. Below we describe the process that we followed to reach our recommendations.

What is the stroke community?

The stroke community is a vibrant and diverse network encompassing individuals and organisations across the stroke pathway.

- At its heart are **stroke survivors and their families**, whose lived experiences and needs shape the priorities for stroke care.
- Surrounding them is a **multidisciplinary network of health professionals and researchers**: stroke physicians, nurses, therapists, rehabilitation specialists and researchers working together to deliver high quality person-centred care.
- **Integrated stroke delivery networks (ISDNs)** are the 'key vehicle for transforming stroke care across the country' and delivering NHS England's National Stroke Service Model – the blueprint for evidence-based stroke care across the pathway.
- The **voluntary and charity sectors**, led by organisations like the Stroke Association, offer life-after-stroke services, advocacy, fund a successful research programme and deliver innovative, evidence-based solutions to improve outcomes.

Engagement process

The recommendations in this report are built on an extensive engagement process designed to bring together voices from across the stroke pathway. Over 350 stakeholders participated, representing all the elements of the stroke community described above.

The engagement process prioritised inclusivity and a comprehensive understanding of community priorities, employing multiple methods:

1. **Healthcare professional survey:** nearly 300 responses identified barriers and opportunities across prevention, acute care, and recovery.
2. **Four virtual roundtables:** sessions addressed prevention, acute care, and recovery, including one dedicated to stroke survivors' experiences.
3. **In-person roundtable:** stakeholders shared insights to guide actionable recommendations.
4. **Feedback:** feedback was reviewed and categorised to ensure alignment with the stroke community's diverse needs.

Participants were encouraged to envision transformative stroke services through the lens of the Government's three strategic shifts, capturing the opportunities that the stroke community thought possible to support better health beyond stroke while still capturing stroke-specific recommendations.



Prevention: how can we move from treating illness to preventing strokes altogether?



Acute care: how can technology and digital solutions improve stroke care quality and speed?



Recovery and support: what investments are needed to strengthen community-based, person-centred recovery?

By prioritising inclusion, evidence, and the lived experiences of stroke survivors, this report aims to deliver a roadmap for equitable, high-quality stroke care across England. The collective efforts of the stroke community will help build a future where every stroke survivor receives the support they need, no matter where they live. We are hugely grateful for the time and contributions all participants gave to this report.

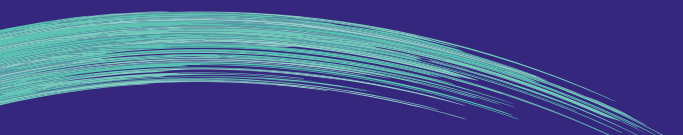
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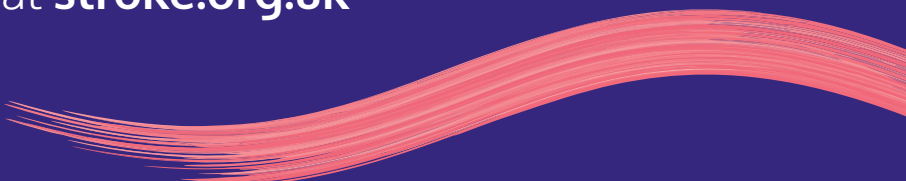
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The Stroke Association is the only charity in the UK providing lifelong support for all stroke survivors and their families. We provide tailored support to tens of thousands of stroke survivors each year, fund vital stroke research, and campaign to secure the best care and support for everyone affected by stroke.

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