

Evidence Brief: Stroke workforce

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Produced by the Knowledge Management team Evidence Briefs offer an overview of the published reports, research, and evidence on a workforce-related topic.

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- [Complete Evidence Brief list – link for External staff](#)

Key publications – the big picture

[National Clinical Guideline for Stroke for the UK and Ireland](#)

2023, Intercollegiate Stroke Working Party

This guideline relates to those aspects of clinical management that are specific to stroke; it does not seek to address areas of routine clinical practice and good governance such as courtesy and respect for the individual, shared decision making and supporting patient choice, accurate record keeping etc.

[Sentinel Stroke National Audit Programme \(SSNAP\)](#)

2023, King's College London

The Sentinel Stroke National Audit Programme (SSNAP) is a major national healthcare quality improvement programme. We measure how well stroke care is being delivered in the NHS in England, Wales and Northern Ireland. We provide timely information to clinicians, commissioners, patients and the public so it can be used to improve the quality of care that is provided to patients.

SSNAP's [clinical audit](#) collects a minimum dataset for stroke patients in every acute hospital in England, Wales and Northern Ireland, and follows the pathway through recovery, rehabilitation, and outcomes at the point of their 6 month assessment. SSNAP is the only national stroke register in the world to collect longitudinal data on the processes and outcomes of stroke care up to 6 months after stroke.

[National Stroke Service Model: Integrated Stroke Delivery](#)

[Networks](#) September 2022, NHS England

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.

[Stroke: GIRFT Programme National Specialty Report](#) April 2022, GIRFT

[p. 134 Workforce] The workforce engaged in providing care for patients with stroke must provide a comprehensive and integrated service wherever possible that encompasses prevention, recognition of stroke and its mimics, early management during hyperacute and acute phases, post-acute stroke management, early inpatient rehabilitation and community-based services, including life after stroke support, secondary prevention and end of life care.

The care pathway must also address the challenge of long-term rehabilitation, re-enablement and helping stroke survivors manage the impacts of their stroke, whilst maximising their quality of life and participation in normal activities. These latter

phases present an ongoing and often poorly realised workforce challenge, which stretches beyond the normal confines of trained and registered health and social care professionals and includes relatives, carers and third sector groups in providing interventions. This informal workforce, which rarely has professional registration or qualification, would nevertheless benefit from a shared set of skills and understanding to meet the needs of stroke survivors.

[We are the NHS: People Plan for 2020/2021 – action for us all](#) July 2020, NHS

We are the NHS: People Plan 2020/21 – action for us all, along with [Our People Promise](#), sets out what our NHS people can expect from their leaders and from each other. It focuses on how we must all continue to look after each other and foster a culture of inclusion and belonging, as well as take action to grow our workforce, train our people, and work together differently to deliver patient care.

[Stroke](#) n.d., Health Education England

Lack of access to post-acute rehabilitation is where the least progress has been made over the last 10 years. Less than a third of stroke survivors receive a review of their progress and unmet needs at six months post stroke. A whole system workforce approach is needed to address the skills and capability for stroke prevention and detection; hyper-acute stroke services; specialist assessment and rehabilitation; and life after stroke.

[Stroke: A training resources guide](#) June 2021, Health Education England

[...] the need for embedding virtual education into stroke services has been highlighted and the delivery of education using digital and virtual solutions enable staff to maximise time-saving opportunities ([Ford et al. 2020](#)). The importance of looking at

ways to both cross skill and up skill the available workforce is critical, particularly where there have been highlighted deficiencies in training ([Natarajan et al. 2019](#)). This includes the entire workforce, from staff in the emergency departments through to the community and voluntary sector. The aim of this guide is to provide learners with a comprehensive list of available resources that can be used simultaneously with the [SSEF](#) to support workforce upskilling, training and development.

[Restoration and recovery of stroke services during the COVID-19 pandemic](#) July 2020, Oxford Academic Health Science Network

[See section 3.2: Workforce]

In normal times, quality improvement in stroke care for the most part happens incrementally. Planned changes are considered, agreed and implemented, and the impact of changes is monitored in the regular Sentinel Stroke National Audit Programme. This approach leads to slow, continuous improvement. Occasionally services have to deal with challenges that suddenly disrupt quality of care, such as staff departures, but these tend to be timelimited, affecting individual units rather than entire networks

[NHS Long Term Plan](#) January 2019, NHS

The NHS Long Term Plan set out the ambitions for the NHS over the next 10 years, [identifying stroke as a clinical priority](#). It outlines how improvements along the full pathway from symptom onset to ongoing care, including prevention, treatment and rehabilitation, would result in the NHS having the best performance in Europe for people with stroke.

Case Studies

[Learning from stroke reconfiguration in London and Greater Manchester: a case study of a new form of research dissemination](#) n.d, UCL and Kaleidoscope, funding by NIHR
From March to May 2018 UCL and Kaleidoscope sought to start fresh conversations on how to achieve successful system change in the NHS. The events were underpinned by a mixed methods evaluation of changes to acute stroke services in London and Greater Manchester; both the research and the events series were funded by the National Institute for Health Research. The events included over 110 people joining live, with 85% of attendees coming from outside academia. There were also 7,200 visitors to the series' website. The methods used provide a new way to disseminate and share knowledge between research, practice and policy. All referenced blogs and materials are available at learningfromstroke.com.

[New emotional support service, Liverpool](#) January 2019, NHS Long Term Plan
The Stroke Association has worked jointly with the Liverpool Clinical Commissioning Group and stroke clinicians to design a new emotional support service to fill a gap that meant support was only offered to patients after clinical care finished. The results are positive. 95% of people said they felt much better at coping with their problems and 90% said they felt better at keeping themselves well as they understood their problems better.

[Joint care from the Community Stroke Team and Stroke Association's Reablement Services promotes the health and wellbeing of stroke survivors](#) January 2019, NHS Long Term Plan
Partnership working between the NHS and the Stroke Association's Reablement Service is ensuring that people

receive timely community based holistic care and support after a stroke, boosting both their health and wellbeing.

[Productive workforce utilisation at Whittington Health NHS Trust](#) n.d., Skills for Health
Improved workforce utilisation and enhanced patient care by using competence-based roles to modernise services and develop staff skills.

The Star for workforce redesign

More resources and tools are available in [the Star](#)

Statistics

You can find relevant statistics on the [Health and Care Statistics Landscape](#); search for “**stroke**”

National Data Programme

Workforce, Training and Education staff can look at the [National Data Warehouse \(NDL\)](#) SharePoint site to find out more about datasets and Tableau products.

Published Peer Reviewed Research

COVID-19

[Was COVID-19 Associated With Worsening Inequities in Stroke Treatment and Outcomes? September 2023, Stroke](#)

Stroke care during the pandemic could have been impacted by disruptions to usual processes of care, or by delay and deferral of care among patients experiencing stroke symptoms. Based on data from the GWTG (Get With The Guidelines) Stroke national registry, previous studies reported increases in mortality rates and stroke severity during the pandemic and no differences in the use of reperfusion therapy.^{23, 24} In contrast, although we also found increases in mortality, we found increases in the use of reperfusion therapy and no increase in stroke severity. The discrepancies in the findings may be due in part to differences in patient samples. Although the GWTG Stroke registry is a convenience sample that includes patients of all ages at a subset of hospitals participating in the GWTG quality improvement initiatives, our study is based on a larger population-based sample of elderly Medicare patients and includes patients at a much broader range of hospitals. Additionally, our study examined the effect of the pandemic as a function of the weekly hospital COVID-19 burden, whereas previous studies compared the prepandemic to the pandemic period by combining all of the patients in the pandemic period into 1 group, regardless of the inpatient COVID-19 burden. Although these earlier studies examined the impact of COVID-19 on the overall treatment and outcomes of patients with ischemic strokes, to our knowledge, no other study has examined the effects of COVID-19 on disparities in stroke outcomes and treatment.

[Nursing's Contributions to Stroke Care During COVID-19 March 2022, Stroke](#)

Within the past 2 years during the COVID-19 pandemic, nursing has made many valuable contributions that address the needs of stroke survivors and their family caregivers. Despite the advances, more work needs to be performed in the following areas: comparing the use of telephone, iPad, Zoom, and Facetime for educational interventions and how this affects outcomes (e.g., knowledge, satisfaction, skill training); exploring how the cultivation of resourcefulness affects the physical and mental health of stroke survivors and family caregivers; and examining the feasibility and care outcomes associated with cross training stroke nurses to function in the emergency department, floor, and intensive care units during crisis situations. Through continued targeted nursing research, evidence-based practice will continue to be refined and provide important insights to move us forward.

[Global impact of COVID-19 on stroke care January 2021, International Journal of Stroke](#)

There was a significant global decline in mechanical thrombectomy and stroke admissions over the three months studied during the pandemic. These decreases were seen regardless of COVID-19 admission burden, individual prepandemic stroke, and MT volumes. Thus, it is critical to expeditiously raise public awareness to prevent the additional healthcare consequences associated with the lack of stroke treatment. These findings can inform regional stroke networks preparedness²⁹ in the face of a future pandemic or anticipated surge of COVID-19 cases in order to ensure that the access and quality of stroke care remains preserved despite the crises imposed by the continuous spread of the virus.

[Integrating New Staff into Endovascular Stroke-Treatment Workflows in the COVID-19 Pandemic January 2021, American Journal of Neuroradiology](#)

A health care crisis such as the coronavirus disease 2019 (COVID-19) pandemic requires allocation of hospital staff and resources on short notice. Thus, new and sometimes less experienced team members might join the team to fill in the gaps. This scenario can be particularly challenging in endovascular stroke treatment, which is a highly specialized task that requires seamless cooperation of numerous health care workers across various specialties and professions. This document is intended for stroke teams who face the challenge of integrating new team members into endovascular stroke treatment workflows during the COVID-19 pandemic or any other global health care emergency. It discusses the key strategies for smooth integration of new stroke-team members in a crisis situation: 1) transfer of key knowledge (simple take-home messages), 2) open communication and a nonjudgmental atmosphere, 3) strategic task assignment, and 4) graded learning and responsibility. While these 4 key principles should generally be followed in endovascular stroke treatment, they become even more important during health care emergencies such as the COVID-19 pandemic, when health care professionals have to take on new and additional roles and responsibilities in challenging working environments for which they were not specifically trained.

[Stroke care in Italy at the time of the COVID-19 pandemic: a lesson to learn September 2020, Journal of Neurology](#)

From March to May 2020, the Italian health care system, as many others, was almost entirely devoted to the fight against the COVID-19 pandemic. In this context, a number of questions arose, from the increased stroke risk due to COVID-19 infection to the quality of stroke patient care. The overwhelming need of COVID-19 patient management made mandatory a complete re-

organization of the stroke pathways: many health professionals were reallocated and a number of stroke units was turned into COVID-19 wards. As a result, acute stroke care suffered from a shortage of services and delays in time-dependent treatments and diagnostic work-up. In-patient and out-patient care and rehabilitation facilities for stroke survivors were also reduced or slowed down, to direct resources to COVID-19 patients care and to reduce contagion risks. Overall, this is likely to result in a significant future increased burden of complications and disabilities that will impact the health care systems in the coming months. Thus, while still fighting against COVID-19 disease, authorities need to promptly implement robust action plans, including an increase of workforce, without forgetting the assurance of a high level of stroke care. The medical community and the health care administrators should always keep in mind that stroke was before, and will be after the pandemic, a, sometimes, life-threatening condition, and almost always a disease with a severe impact on the quality of life.

New ways of working

[Audit as a Tool for Improving the Quality of Stroke Care: A Review March 2023, International Journal of Environmental Research and Public Health](#)

Results: Studies showed that an audit brought an improvement in rehabilitation processes when it included a team of experts, an active training phase with facilitators, and short-term feedback. In contrast, studies looking at an audit in stroke prevention showed contradictory results. Conclusions: A clinical audit highlights any deviations from clinical best practices in order to identify the causes of inefficient procedures so that changes can be implemented to improve the care system. In the rehabilitation phase, the audit is effective for improving the quality of care processes.

[The acute telestroke model of care in Australia: a potential roadmap for other emergency medical services?](#) June 2022, Medical Journal of Australia (*OpenAthens log-in required*)
Its full potential is beyond the Australian borders; collaborative projects between Australian stroke specialists and Pacific physicians focused on acute stroke care and reperfusion therapies are being planned. Moreover, the initial review and expedited diagnosis performed by the stroke physician reduces unnecessary transfers for specialist assessment and investigations at the comprehensive stroke centre.

[Exploring self-management within hospital-based stroke care: current and future opportunities](#) June 2022, Disability & Rehabilitation (*OpenAthens log-in required*)
This study explored stroke self-management within a tertiary hospital setting from the perspectives of health professionals working across the continuum of stroke care. Two themes emerged from the data: Pieces of the puzzle illustrates the inconsistent understanding about self-management with elements of the puzzle described but rarely within the full concept of self-management; Readiness for self-management highlighted that although self-management should commence in the acute setting, there were many factors influencing why this was not always happening. A consistent conceptualisation and approach to stroke self-management in the hospital setting is required. Interprofessional education and shared intentional language can enhance understanding and practice. Understanding and application of stroke self-management varies among members of hospital-based stroke teams. Health professionals working in hospital-based stroke care should use the term self-management with their patients. Education of healthcare teams is necessary to develop knowledge about self-management and develop consistent practices across the continuum of care.

[Simulation-based training improves process times in acute stroke care \(STREAM\)](#) January 2022, European Journal of Neurology (*OpenAthens log-in required*)
Background: The objective of the STREAM Trial was to evaluate the effect of simulation training on process times in acute stroke care.

Methods: The multicenter prospective interventional STREAM Trial was conducted between 10/2017 and 04/2019 at seven tertiary care neurocenters in Germany with a pre- and post-interventional observation phase. We recorded patient characteristics, acute stroke care process times, stroke team composition and simulation experience for consecutive direct-to-center patients receiving intravenous thrombolysis (IVT) and/or endovascular therapy (EVT). The intervention consisted of a composite intervention centered around stroke-specific in situ simulation training. Primary outcome measure was the 'door-to-needle' time (DTN) for IVT. Secondary outcome measures included process times of EVT and measures taken to streamline the pre-existing treatment algorithm.

Results: The effect of the STREAM intervention on the process times of all acute stroke operations was neutral. However, secondary analyses showed a DTN reduction of 5 min from 38 min pre-intervention (interquartile range [IQR] 25-43 min) to 33 min (IQR 23-39 min, $p = 0.03$) post-intervention achieved by simulation-experienced stroke teams. Concerning EVT, we found significantly shorter door-to-groin times in patients who were treated by teams with simulation experience as compared to simulation-naive teams in the post-interventional phase (-21 min, simulation-naive: 95 min, IQR 69-111 vs. simulation-experienced: 74 min, IQR 51-92, $p = 0.04$).

Conclusion: An intervention combining workflow refinement and simulation-based stroke team training has the potential to improve process times in acute stroke care.

[What would 'upscaling' involve? A qualitative study of international variation in stroke rehabilitation](#) April 2021, BMC Health Services Research

Demand for stroke rehabilitation is expected to grow dramatically; with the estimated prevalence of stroke survivors rising to 70 million worldwide by 2030. The World Health Organization's (WHO) report - [Rehabilitation 2030: A call for action](#) – has introduced the objective of 'upscaling' rehabilitation globally to meet demand. This research explored what upscaling stroke rehabilitation might mean for health professionals from countries at different stages of economic development.

[Developing a Hyperacute Stroke-Ready Nursing Workforce: a Service Improvement Initiative](#) October 2020, British Journal of Neuroscience Nursing (Abstract only*)

Background: Thrombolysis treatment varies considerably between in- and out-of-hours services. Aims: This improvement initiative aimed to upskill acute stroke unit nurses as stroke thrombolysis response nurses, testing a new model of nursing in readiness for hyperacute stroke unit developments. Methods: Three registered nurses were trained to a specialist competency framework. The role was tested over 28 weeks, and times to treatment milestones were measured. Thrombolysed patients from the test period were statistically compared with a matched group using a two-sample t-test in Excel. Qualitative feedback was sought from the stroke team, medical and emergency department colleagues. Findings: Median out-of-hours door-to-needle time reduced from 85 to 61.5 minutes. Statistically significant differences were seen in the time to stroke unit admission ($p=0.012$) and swallow screen ($p=0.038$). Stroke and emergency department colleagues considered the role essential

to out-of-hours thrombolysis treatment. Conclusions: The stroke thrombolysis response nurse role reduced variation in treatment and improved timely acute stroke care. This work may inform the development of stroke nursing workforce models.

[Conference Abstract: The quality improvement \(QI project\) in senior decision making at the door: Matching workforce to patients needs in hyperacute stroke](#) 2019, International Journal of Stroke

Introduction: Historically stroke unit had a traditional model where stroke pathways were influenced by a junior member on the door. The result was poor patient and staff experience, poor retention, mimic patients in HASU, multiple outlier's strokes waiting for HASU beds and crowding in ED and HASU. Method(s): This clinically led QI project was designed as part of the Pride way with Virginia Mason Institute methods with a focus on lean, waste management, 5S and team huddle. A time plot analysis of patient arrival journey including stroke mimics with other time-dependent activities of senior decision maker been included in the model of the desired stroke medical workforce to meet demands with new team job planning was implemented. Result(s): The maximum activity was observed between 1300 to 0100 and workforce available was minimal from 1700 to 0900 suggesting mismatch. The new way of working after QI means the timing of senior review dropped by 30%, the median time of stroke patients to HASU was now 176 minutes, Stroke admissions are reduced by 26%, Stroke Bed availability has increased to 0 outliers from 10-14 outliers previously. By new way of extra ED cover by stroke consultant provided 46% more patients direct access. Length of stay dropped by 3.6 days, Mortality dropped by 25%, reliability of care increased by 91% with speed of hyperacute care delivery increased by 35%. Staff rated Safety, Efficiency, Training and Staff Satisfaction as improved. Conclusion(s): The demand and capacity model observed clear mismatch in the arrival of stroke patient's time

and available workforce. The stroke patients survive better if they have access to senior decision maker early with new job planning and be able to admit stroke patients in HASU it reduces harm.

Stroke care organisation and staffing

[The role of the healthcare assistant on a stroke unit: A scoping review September 2023, Clinical Rehabilitation \(OpenAthens log-in required*\)](#)

A healthcare assistants' role was viewed as caring directly for patients – some individuals felt they contributed to rehabilitation during these tasks, and that they could be undervalued by multidisciplinary team members, patients and their families. The barriers identified to healthcare assistants' role fulfilment were lack of time, training and staffing shortages. Training was perceived to improve healthcare assistants' communication, confidence and knowledge but training needed to be flexible, ward based and accommodate staffing shortages. However, it is unclear whether training has any clinical benefit for patients. Conclusion: Healthcare assistants are well placed to enhance rehabilitative practice with patients; however, there are clear perceived barriers to this occurring. Future research should aim to define the role of healthcare assistants and explore whether further stroke-specific training could cause clinical benefits for patients.

[Nursing Care for Stroke Patients: Current Practice and Future Needs September 2023, Nursing Reports \(OpenAthens log-in required*\)](#)

As per the results of the study, there is an urgent need for stroke units run by specialized stroke nurses to provide early stroke management and improve survivors' outcomes. Structured stroke-care programs are needed to improve nursing practice and meet the international standard of stroke care.

[Ideal Foundational Requirements for Stroke Program Development and Growth: A Scientific Statement From the American Heart Association February 2023, Stroke](#)

Stroke center certification has evolved at a rapid pace and is now available at 4 different levels of service in the United States. Although certification standards provide guidance on stroke center process elements, lack of guidance on structural components such as workforce, staffing, and unit operations has resulted in heterogeneous services among hospitals credentialed at the same stroke center level. Such heterogeneity challenges public expectations and transparency about actual service capabilities within American stroke centers and in some cases may foster leniency in credentialing agency certification methods. Standards for other time-dependent diagnoses, including trauma, provide detailed guidance on structural elements that has improved patient triage and resuscitative care while enabling practitioners and administrators to more accurately gauge and plan service development to better support their communities. This scientific statement aims to provide similar structural guidance defined by each level of hospital stroke center services to reduce operational inconsistencies, to foster planning for service development, and to improve the interprofessional care of patients with acute stroke.

[Variation in stroke care at the hospital level: A cross-sectional multicenter study October 2022, Frontiers in Neurology](#)

Physicians and other healthcare professionals aim to improve the quality of care by implementing and adhering to evidence-based guidelines. However, evidence shows that only 55% of patients receive recommended care, resulting in a gap between guidelines and daily clinical practice (1–4). This may interfere with patients receiving optimal medical treatment, as described in clinical guidelines, and may affect outcomes (5).

[The Mobile Stroke Unit Nurse: An International Exploration of Their Scope of Practice, Education, and Training April 2022, Journal of Neuroscience Nursing \(OpenAthens log-in required*\)](#)
AIMS: The aim of this study was to explore the expanded scope of practice of nurses working on MSUs by identifying MSUs with onboard nurses; describing the roles and responsibilities, training, and experience of MSU nurses, through a search of the literature; and describing 2 international MSU services incorporating nurses from Memphis, Tennessee, and Melbourne, Australia. RESULTS: Ninety articles were found describing 15 MSUs; however, staffing details were lacking, and it is unknown how many employ nurses. Nine articles described the role of the nurse, but role specifics, training, and expertise were largely undocumented. The MSU in Memphis, the only unit to be staffed exclusively by onboard nurse practitioners, is supported by a neurologist who consults via telephone. The Melbourne MSU plans to trial a nurse-led telemedicine model in the near future. CONCLUSION: We lack information on how many MSUs employ nurses, and the nurses' scope of practice, training, and expertise. Expert stroke nurse practitioners can safely perform many of the tasks undertaken by the onboard neurologist, making a nurse-led telemedicine model an effective and potentially cost-effective model that should be considered for all MSUs.

[Nursing's Role in Successful Stroke Care Transitions Across the Continuum: From Acute Care Into the Community November 2021, Stroke](#)

The purpose of this article is to provide evidence on the important nursing roles in stroke care and transition management across the care continuum, discuss cross-setting issues in stroke care, and provide recommendations to leverage nursing's impact in optimizing outcomes for stroke survivors and their family unit across the continuum. To optimize nursing's influence in facilitating safe, effective, and efficient care

transitions for stroke survivors and their family caregivers across the continuum we have the following recommendations (1) establish a system of coordinated and seamless comprehensive stroke care across the continuum and into the community; (2) implement a stroke nurse liaison role that provides consultant case management for the episode of care across all settings/services for improved consistency, communication and follow-up care; (3) implement a validated caregiver assessment tool to systematically assess gaps in caregiver preparedness and develop a tailored caregiver/family care plan that can be implemented to improve caregiver preparedness; (4) use evidence-based teaching and communication methods to optimize stroke survivor/caregiver learning; and (5) use technology to advance stroke nursing care. Nurses must leverage their substantial influence over the health care delivery system to achieve these improvements in stroke care delivery to improve the health and lives of stroke survivors and their families.

[Healthcare professionals' competence in stroke care pathways: A mixed-methods systematic review December 2020, Journal of Clinical Nursing](#)

We recommend organisational support and formulation of stroke care patient guidelines in line with healthcare competence requirements. Focus should be added for nursing professions in developing interactive communication competence since nurses spend the majority of the time providing individual patient care. Also, organisations should integrate continuing training in specialised stroke care for healthcare professionals' competence development.

[Conference Abstract: A stroke specific speech and language therapy \(SLT\) time in motion audit-recorded throughout eight Greater Manchester \(GM\) hyper acute stroke units \(HASUs\) and district stroke centres \(DSCs\) 2019, International Journal of Stroke](#)

Introduction: The current Royal College of Physicians (RCP) and British Association of Stroke Physicians (BASP) recommended staffing levels for SLT do not meet the requirements of patients accessing inpatient stroke care. A better understanding of the demands placed on SLTs is required to inform future guidance on staffing levels and skill mix. Method(s): A stroke-specific SLT time in motion audit was carried out across GM over a 4-week period in September 2018. 3 HASUs and 5 DSCs recorded data in 15 minute time slots, for analysis as percentages of the working month. Result(s): 2895 hours of cumulative data were collected. A stark inequality and variation in SLT staffing and skill mix were identified across GM. Time spent on patient-related tasks was high at 66-95%. However face-to-face time ranged from 31- 48%, demonstrating a significant proportion of the clinical demands placed on SLTs are not patient facing. Therapy time was low ranging from 2-30% and was mostly carried out by therapy assistants due to other demands placed on qualified SLTs. Time spent on instrumental tasks like swallowing assessments was low 0-7%, given the high incidence of silent aspiration among the acute stroke dysphagic population. Conclusion(s): As small teams, SLT services have insufficient time for duties including their own continuing professional development (CPD), demonstrating how clinical pressures detract from the development of a specialist stroke workforce. The audit supports the need for review of recommended SLT staffing levels for inpatient stroke care. Future recommendations must include skill mix and should reflect the multifaceted role of SLTs.

[Regional variation in acute stroke care organisation 2016, Journal of Neurological Sciences](#)

BACKGROUND: Few studies have assessed regional variation in the organisation of stroke services, particularly health care resourcing, presence of protocols and discharge planning. Our aim was to compare stroke care organisation within middle- (MIC) and high-income country (HIC) hospitals participating in the Head Position in Stroke Trial (HeadPoST). METHODS: HeadPoST is an on-going international multicenter crossover cluster-randomized trial of 'sitting-up' versus 'lying-flat' head positioning in acute stroke. As part of the start-up phase, one stroke care organisation questionnaire was completed at each hospital. The World Bank gross national income per capita criteria were used for classification. RESULTS: 94 hospitals from 9 countries completed the questionnaire, 51 corresponding to MIC and 43 to HIC. Most participating hospitals had a dedicated stroke care unit/ward, with access to diagnostic services and expert stroke physicians, and offering intravenous thrombolysis. There was no difference for the presence of a dedicated multidisciplinary stroke team, although greater access to a broad spectrum of rehabilitation therapists in HIC compared to MIC hospitals was observed. Significantly more patients arrived within a 4-h window of symptoms onset in HIC hospitals (41 vs. 13%; $P<0.001$), and a significantly higher proportion of acute ischemic stroke patients received intravenous thrombolysis (10 vs. 5%; $P=0.002$) compared to MIC hospitals. CONCLUSIONS: Although all hospitals provided advanced care for people with stroke, differences were found in stroke care organisation and treatment. Future multilevel analyses aims to determine the influence of specific organisational factors on patient outcomes.

Volunteers

[Volunteer Engagement in a Stroke Self-Management Program: Qualitative Analysis of a Hybrid Team of Healthcare Providers and Trained Volunteers July 2022, International Journal of Environmental Research and Public Health](#)

The findings of this study highlight that volunteer-assisted stroke self-management programs entail a bilateral exchange of knowledge and support between healthcare providers/volunteers and survivors. They also encourage the adoption of an individualized, goal-oriented and confidence-enhancing approach. Volunteer engagement can be optimized by developing well-designed programs that sufficiently clarify volunteers' roles, strengthen their collaborations with healthcare providers and fulfil their training needs in caring for and communicating with stroke survivors. Future research should evaluate the use of peer and healthcare professional volunteers in self-management programs and thereby build community capacity to support the recovery of stroke survivors.

[Volunteers as members of the stroke rehabilitation team: a qualitative case study April 2020, BMJ Open](#)

Clinicians are facing increasing demands on their time, exacerbated by fiscal constraints and increasing patient complexity. Volunteers are an essential part of the many healthcare systems, and are one resource to support improved patient experience and a mechanism through which to address unmet needs. Hospitals rely on volunteers for a variety of tasks and services, but there are varying perceptions about volunteers' place within the healthcare team. This study aimed to understand the role of volunteers in stroke rehabilitation, as well as the barriers to volunteer engagement. A qualitative case study was conducted to understand the engagement of volunteers in stroke rehabilitation services within a complex rehabilitation and continuing care hospital in Ontario, Canada. 28 clinicians, 10

hospital administrators and 22 volunteers participated in concurrent focus groups and interviews. Organisational documents pertaining to volunteer management were retrieved and analysed. While there was support for volunteer engagement, with a wide range of potential activities for volunteers, several barriers to volunteer engagement were identified. These barriers relate to paid workforce/unionisation, patient safety and confidentiality, volunteer attendance and lack of collaboration between clinical and volunteer resource departments. An interprofessional approach, specifically emphasising and addressing issues related to key role clarity, may mediate these barriers. Clarity regarding the role of volunteers in hospital settings could support workforce planning and administration.

Diversity, Inclusion and Participation

[Diversity, Equity, Inclusion, and Health Inequities Training in Neurologic Disorders and Stroke: Analysis and Recommendations From the NINDS Advisory Council Working Group August 2023, Neurology](#)

The working group recommends support for 2 distinct types of training activities: one designed for scientists from historically under-represented backgrounds and the second designed for scientists of all backgrounds performing health inequities research. Support for grant writing workshops and establishment of multi-institutional mentorship networks are recommended as potentially especially high-yield activities. The working group recommends that all NINDS-supported investigators should have sufficient diversity, equity, and inclusion training to be prepared and qualified to mentor trainees from under-represented backgrounds and mentor trainees engaged in health disparities research; there should be no "diversity tax" placed on established investigators from under-represented backgrounds to shoulder all the mentorship responsibilities. Among other

recommendations, training in health disparities research should include a focus on interventional studies to alleviate inequities as well as social science and qualitative methods.

[How to Be Savvy About Gender Disparities in Academic Stroke Medicine: Five Practical Strategies](#) September 2020, *Stroke* (Abstract only*)

In the past decade, stroke medicine has evolved from discovery of innovative diagnostic tools to implementation of new treatments. These advances are projected to increase the demand for stroke neurologists in academic and clinical practices, but hopefully with equitable opportunities for everyone across the gender spectrum. Academic medicine provides opportunities to participate in clinical care, teaching, research, and administration. The early career stage is short-focused on finding an academic niche and developing new skills that will help you navigate the academic environment. A recent InterSECT article emphasized the critical role of women's leadership in stroke medicine. In this article, we reflect on workforce gender disparities and provide 5 practical strategies that may help women overcome barriers and advance their work mission.

Integrated care

[Rotterdam Stroke Service: audits for the quality of integrated care](#) August 2019, *International Journal of Integrated Care* (Abstract only*)

Seven stroke services received a report on their best practices and points of improvement. The audit team complimented the RSS for their clear information and the comprehensive commitment of all the integrated care partners. The organization and quality of education and research were rated very positive. There was also much appreciation for the “stroke after-care” method that was developed in the RSS.

Points of improvement were the interdisciplinary collaboration, exchange of patient information via ICT and involvement of informal caregivers. Furthermore, results of new projects were not always sufficiently disseminated between the organizations and the collaboration between the integrated care partners and general practitioners was not always satisfactory.

Burnout

[Impact of Stroke Call on the Stroke Neurology Workforce in the United States: Possible Challenges and Opportunities](#) July 2018, *Journal of Stroke & Cerebrovascular Diseases* (Abstract only*)

Background: The Stroke & Vascular Neurology Section of the American Academy of Neurology was charged to identify challenges to the recruitment and retention of stroke neurologists and to make recommendations to address any identified problems. The Section initiated this effort by determining the impact of stroke on-call requirements as a barrier to the recruitment and retention of vascular neurologists. Methods: This is a cross-sectional survey of a sample of US Neurologists providing acute stroke care. Results: Of the 900 neurologists who were sent surveys, 313 (35%) responded. Of respondents from institutions providing stroke coverage, 71% indicated that general neurologists and 45% indicated that vascular neurologists provided that service. Of those taking stroke call, 36% agreed with the statement, "I spent too much time on stroke call," a perception that was less common among those who took less than 12-hour shifts ($P < .0001$); 21% who participated in stroke call were dissatisfied with their current job. Forty-six percent indicated that their stroke call duties contributed to their personal feeling of "burnout." Conclusions: Although the reasons are likely multifactorial, our survey of neurologists providing stroke care suggests that over-burdensome on-call responsibilities may be contributing to the vascular neurology

workforce burnout and could be affecting recruitment and retention of vascular neurologists. Strategies to reduce the lifestyle impact of stroke call may help address this problem.

Career progression

[A sustainable stroke nursing workforce requires a clear pathway for career progression December 2017, British Journal of Neuroscience Nursing \(Abstract only*\)](#)

The author conveys her thoughts on an emerging evidence about the central role of stroke nurses in lowering mortality rates and ensuring quality outcomes and mentions related topics such as the Nursing and Midwifery Council, the National Health Service, and transient ischaemic attack.

Education and Training

[Gender and Sex Equity in Stroke Research, Education, and Care January 2023, Stroke](#)

Undergraduate clinical education has become more supportive of TGNCNBI folks; however, this progress toward inclusion is not consistent between institutions. Between the limited exposure to TGNCNBI health education and use of outdated vocabulary, there are several barriers impeding further progress toward a gender- and sex-inclusive healthcare system.

A 2011 study found most medical schools only provided 4 to 5 curricular hours to issues pertaining to LGBTQIA+ individuals.⁴ Topics that have relevance to CVD in TGNCNBI people, such as substance use, chronic disease risk, gender-affirming care, body image, and transitioning, were taught in <40% of schools. Since 2011, there has been a small increase in the number of transgender focused standardized cases and short-term curricula during preclinical or clerkship years, but many are not inclusive of nonbinary and intersex people, nor is TGNCNBI

health integrated throughout the overall curriculum. To our knowledge, there are no publications describing curriculum addressing stroke and CVD in TGNCNBI people.

Another important gap to address in clinical education is the use of outdated vocabulary when introducing TGNCNBI concepts and terminology. Both TGNCNBI trainees and patients frequently need to explain how to care for TGNCNBI people or interact with TGNCNBI colleagues. Much of this can be attributed to a lack of LGBTQIA+ clinical education when the current faculty and preceptors were trainees and lack of required LGBTQIA+ content in continuing medical education.

[Conference Abstract: Stroke medicine teaching in UK medical schools: A design for a nationwide undergraduate stroke education module 2019, International Journal of Stroke](#)

Method(s): We have comprehensively reviewed the Multi-Disciplinary Stroke Education Programme at the University of Leicester, and used the findings to design a new module that has the potential for nationwide uptake. We propose the use of "blended learning" techniques to facilitate situated learning even in the context of the limitations that exist to bedside stroke teaching. Result(s): We evaluated the existing programme according to four domains and found it to be highly successful. The domains were: aims and learning outcomes, teaching settings, accessibility methods and use of student assessment, evaluation and feedback. We used this evaluation to design a new national programme, with constructively aligned learning outcomes and a student-centred pedagogy. We propose centrally and freely available teaching materials that would be supplemented by a non-onerous burden of teaching and feedback contact hours for each medical school, delivered over 4 days, combined with a centralised assessment process. Conclusion(s): We have used the findings of our review to design a new course for nationwide implementation to facilitate situated

learning, even where the potential for bedside teaching of large groups is limited.

[Stroke doctors: Who are we? A World Stroke Organisation survey October 2017, International Journal of Stroke](#)

Specialist training provides skilled workforce for service delivery. Stroke medicine has evolved rapidly in the past years. No prior information exists on background or training of stroke doctors globally. To describe the specialties that represent stroke doctors, their training requirements, and the scientific organizations ensuring continuous medical education. The World Stroke Organization conducted an expert survey between June and November 2014 using e-mailed questionnaires. All Organization for Economic Co-operation and Development countries with >1 million population and other countries with >50 million population were included (n = 49, total 5.6 billion inhabitants, 85% of global strokes). Two stroke experts from each selected country were surveyed, discrepancies resolved, and further information on identified stroke-specific curricula sought. We received responses from 48 (98%) countries. Of ischemic stroke patients, 64% were reportedly treated by neurologists, ranging from 5% in Ireland to 95% in the Netherlands. Per thousand annual strokes there were average six neurologists, ranging from 0.3 in Ethiopia to 33 in Israel. Of intracerebral hemorrhage patients, 29% were reportedly treated by neurosurgeons, ranging from 5% in Sweden to 79% in Japan, with three neurosurgeons per thousand strokes, ranging from 0.1 in Ethiopia to 24 in South Korea. Most countries had a stroke society (86%) while only 10 (21%) had a degree or subspecialty for stroke medicine. Conclusions Stroke doctor numbers, background specialties, and opportunities to specialize in stroke vary across the globe. Most countries have a scientific society to pursue advancement of stroke medicine, but few have stroke curricula.

Advanced Practice

[Stroke advanced clinical practitioner and stroke specialist nurse: what is the difference? May 2023, British Journal of Neuroscience Nursing \(OpenAthens log-in required*\)](#)

The stroke advanced clinical practitioner (ACP) and stroke specialist nurse (SSN) are two vitally important roles within the hyper acute stroke unit, acute stroke unit and spoke sites that provide acute stroke care for continued rehabilitation until the point of discharge. The SSN role has been developed over the past decade, whereas the ACP role is much newer. While there are similarities between the two roles, there are some core differences that allow the two roles to coexist and support one another. It is important to understand the two roles, the differences and how each will benefit from the other, as this will allow teams working within hyper acute stroke units and acute stroke units to work to their full potential, while ensuring professional and patient safety and enhancing job satisfaction and patient care.

[Exploring advanced nursing practice in stroke services: a scoping review April 2021, British Journal of Neuroscience Nursing \(Abstract only*\)](#)

Current research does not clarify the rationale for implementing these posts or how ANP is conceptualised. This review does identify that stroke ANP incorporates the four pillars of advanced practice (clinical, research, leadership and education) and was implemented to improve the quality of stroke care. Barriers and facilitators to implementation were also identified.

[Utilization of Advanced Practice Providers in Advanced Practice Provider-Led Stroke Clinic to Expand Outpatient Stroke Follow-up Care](#) January 2021, *Clinical Nurse Specialist: The Journal for Advanced Nursing Practice* (*OpenAthens log-in required**)

Stroke follow-up care with neurology specialty advanced practice providers is critical to focus on stroke prevention. The need for which is underscored by results of a recent study noting that many stroke survivors of first-ever strokes were not receiving stroke standard-of-care prevention measures including consistent antiplatelet therapies and regular exercise. Study findings further note the rates of usage for stroke prevention interventions (daily anti-platelet therapy, smoking cessation, regular exercise, hypertension control) were between 50% and 70%. Clinical nurse specialists along with nurse practitioner and physician assistant advanced practice providers are uniquely suited to manage outpatient ischemic stroke care to reduce the recurrence of stroke and improve patient outcomes.

[Taking an acute stroke service to the next level: How an advanced nurse practitioner programme transformed our practice and improved access and outcomes for our patients](#)

April 2020, *Nursing Standard* (*Abstract only**)

In 2014, our acute stroke service was not meeting the required national standard. The team of five whole-time-equivalent nurse specialists would take new referrals between 7.30am and 5pm and coordinate the stroke pathway through University Hospital Southampton NHS Foundation Trust. They were trained to do National Institutes of Health Stroke Scale assessment (NIHSS), but needed a medical review to complete their admission clerking, prescribing and requesting of further investigations.

[Conference Abstract: Expanding a stroke advanced Nurse practitioner service to provide 24/7 cover-a summative evaluation-1 year on 2019](#), *International Journal of Stroke*

Introduction: Introducing a stroke Advanced Nurse Practitioner (ANP) team has helped transform the hyper acute service delivered at University Hospital Southampton (UHS) by providing timely specialist assessment and access to hyperacute treatments. Approximately 1 in 5 acute stroke referrals at UHS are received out of hours (OOH's). Expansion of the ANP service is providing stroke specialist involvement at point of entry 24/7, increasing patient access to acute stroke treatments at all hours, day or night. Method(s): SSNAP data, referral records and case notes over the past 2 years were analysed in order to evaluate the benefit of an OOH's ANP service in the treatment of acute stroke patients. Result(s): Since the introduction of a 24 hour ANP presence key performance indicators have increased and less inequality exists between in hour and OOH's care. OOH advances include: More patients receive a CT scan within 1 hour (90% CI). Fewer stroke mimic admissions to the HASU OOH (99% CI) with a greater number receiving a stroke diagnosis (95% CI). Greater detection of appropriate thrombolysis patients OOH (95% CI). Greater access to specialist stroke management within 1 hour from hospital arrival (99% CI). Increase in stroke patients receiving swallow screens within 4 hours from hospital arrival (99% CI). Secondary analysis showed further positive impact on the wider hospital and workforce. Conclusion(s): A 24-hour ANP service better provides rapid access to acute stroke treatments for a significant subset of patients referred OOH, whilst positively affecting staff and organisational priorities and targets.

[The impact of an Advanced Nurse Practitioner training programme in an acute stroke service June 2018, British Journal of Neuroscience Nursing \(Abstract only*\)](#)

Over the last 3 years, specialist stroke nurses, who primarily coordinated the pathway and undertook a standardised National Institutes of Health Stroke Scale (NIHSS) examination, have transitioned into a team of trainee advanced nurse practitioners (t-ANP) with Master's level education completed at the University of Southampton via the Advanced Clinical Practice Master's pathway. This development has allowed the team to use appropriate autonomy to independently clerk, admit and commence treatment of patients suspected to have had an acute stroke. In addition to this, expanded scopes of practice have increased patient access to investigations and treatment, with the t-ANP requesting investigations such as chest X-rays, carotid ultrasound and computed tomography (CT) head imaging. This has contributed to a significant increase in patients receiving a CT head scan within 1 hour of arrival, allowing faster access to hyper-acute treatment and interventions. Master's level modules attended (part-time) at the University of Southampton over a 4-year period ensure a clear level of practice and progression for the team. Support from stroke consultant physicians has allowed both stroke and general medical competencies to be achieved with supervised practice and weekly teaching sessions on stroke-related topics. Further to this, trust-wide courses such as ECG interpretation, advanced life support and a university module in Neurosciences all contribute towards further development within the role. Weekly review meetings with the tANP to discuss key admission performance are held in order to drive the service forward and ensure that improvements can continue to be made. Plans for future development include: t-ANPs to be able to administer IV thrombolysis (currently medical personnel administer in the trust); involvement in helping to lead new research trials alongside research nurses; and expanded scopes of practice in order to request MRI scans for patients

requiring further imaging. The team also plans for future expansion as part of a larger business plan in order to cover regional mechanical thrombectomy referrals.

[Prime movers: Advanced practice professionals in the role of stroke coordinator April 2017, Journal of the American Association of Nurse Practitioners \(Abstract only*\)](#)

Background and purpose: Following a stroke quality improvement clustered randomized trial and a national acute ischemic stroke (AIS) directive in the Veterans Health Administration in 2011, this comparative case study examined the role of advanced practice professionals (APPs) in quality improvement activities among stroke teams. Methods: Semistructured interviews were conducted at 11 Veterans Affairs medical centers annually over a 3-year period. A multidisciplinary team analyzed interviews from clinical providers through a mixed-methods, data matrix approach linking APPs (nurse practitioners and physician assistants) with Consolidated Framework for Implementation Research constructs and a group organization measure. Conclusion: Five of 11 facilities independently chose to staff stroke coordinator positions with APPs. Analysis indicated that APPs emerged as boundary spanners across services and disciplines who played an important role in coordinating evidence-based, facility-level approaches to AIS care. The presence of APPs was related to engaging in group-based evaluation of performance data, implementing stroke protocols, monitoring care through data audit, convening interprofessional meetings involving planning activities, and providing direct care. Implications for practice: The presence of APPs appears to be an influential feature of local context crucial in developing an advanced, facility-wide approach to stroke care because of their boundary spanning capabilities.

Staff perceptions and experiences

[Registered nurses' role experiences of caring for older stroke patients: a qualitative study November 2021, BMC Nursing](#)
(OpenAthens log-in required*)

Results: Two main themes were identified. First, the nurses identified an obvious gap between their ideal role in elderly care and their actual practice. The unsatisfactory reality was linked to the practical difficulties they encountered in their working environment. Second, the nurses expressed conflicting feelings about caring for older stroke patients, displaying a sense of accomplishment, indifference, annoyance, and sympathy. Caring for older stroke patients also affects nurses psychologically and physically. The nurses were clear about their own roles and tried their best to meet the elderly people's needs, yet they lack time and knowledge about caring for older stroke patients. The factors influencing their working experiences extend beyond the personal domain and are linked to the wider working environment. Conclusions: Sustaining the nursing workforce and improving their working experiences are essential to meet the care needs of older people. Understanding nurses' lived working experiences is the first step. At the individual level, nurse managers should promote empathy, relieve anxiety about aging, and improve the job satisfaction and morale of nurses. At the institutional level, policymakers should make efforts to improve the nursing clinical practice environment, increase the geriatric nursing education and training, achieve a proper skill mix of the health workforce, and overall attract, prepare and sustain nurses regarding caring for older people in a rapidly aging society.

[Conference Abstract: Attitudes towards and experience of stroke medicine in the UK: A mixed methods survey of medical students December 2018, International Journal of Stroke](#)

[Entry 209] Introduction: There is no available data on medical student attitudes towards and experience of stroke medicine.

Understanding these may help address the physician workforce crisis in stroke medicine in the UK. Method(s): All UK medical schools were asked to circulate a SurveyMonkey questionnaire to all medical students on 26th October 2016. Students were asked to identify which specialities and subspecialties they were considering for their career (from the GMC approved specialties list), detail their clinical experience in stroke medicine and explain what is appealing or unappealing about a career in stroke medicine. Result(s): We received 1,050 responses covering 7 medical schools in England, Scotland and Wales. Of final year students (n=323), 8% were considering stroke medicine and 68% had less than 1 week of clinical experience of the subspecialty. Those with less experience were less likely to consider the subspecialty (p=0.024). Common themes for finding stroke medicine appealing included the impact of successful treatments on quality of life, recent advances in stroke care and the team-based approach. Common themes for finding stroke medicine unappealing included limited treatment options, slow paced, repetitive, poor outcomes and too specialised. Conclusion(s): Limited exposure to stroke medicine at undergraduate level may contribute to low interest in the subspecialty. Reasons for a negative perception may relate to exposure to a narrow focus within stroke medicine. We recommend broadening training opportunities at medical school across the stroke pathway, incorporating these throughout the undergraduate curriculum and emphasising to medical students those aspects of the subspecialty that they find appealing.

Telemedicine

[Implementation of a telemedicine, stroke evaluation service: a qualitative study August 2022, BMC Health Services Research](#)
(OpenAthens log-in required*)

This study showed that telemedicine stroke evaluation with a remote-controlled CT using local on call personnel was

experienced as valuable in the local community, providing a sense of healthcare services security and equality. The set-up of the service required radiation protection and privacy approvals, which is important to be aware of when planning similar services. Task shifting for paramedics was a main task in the project. This supported the importance of a manager/coordinator role for education and training, as the paramedics needed to acquire theoretical and practical knowledge in working with the telemedicine application combined with CT scanning and new clinical tasks. Management involvement, flexibility, and a culture for coordination and cooperation both within and between the departments locally, and with external hospitals seems to be a key factor both in the implementation process and for keeping the service operating long term.

[Telerehabilitation for Stroke is Here to Stay. But at What Cost? June 2022, Neurorehabilitation & Neural Repair \(OpenAthens log-in required*\)](#)

The use of telerehabilitation after stroke has necessarily increased in the last 2 years because of the COVID-19 pandemic, and many rehabilitation teams rapidly adapted to offering their services remotely. Evidence supporting the efficacy of telerehabilitation is still scarce with few randomized controlled trials, although current systematic reviews suggest that telerehabilitation does not lead to inferior outcomes when compared to face-to-face treatment. Increasing experience of telerehabilitation however has highlighted some of the pitfalls that need to be solved before we see widespread pragmatic adoption of new practices. We must ensure that offering services using digital technologies does not exclude those who need our services. We must acknowledge that our interactions online differ, both in the way we relate to each other and in the content of clinical consultations. Furthermore, we need to consider how to support staff who may be feeling disconnected and fatigued after spending hours providing remote therapies.

Telerehabilitation is likely here to stay and has potential to help deliver rehabilitation to the many people who could benefit, but there are obstacles, challenges and trade-offs to be considered and overcome.

Competency Frameworks

[Stroke-Specific Education Framework n.d., NHS England](#)
In response to the National Stroke Strategy (2007) the UK Stroke Forum developed a training arm with the task of establishing nationally recognised, quality-assured and transferable education programmes in stroke. A Steering Group and four Task Groups developed the Stroke-Specific Education Framework (SSEF), which covers the whole of the stroke care pathway. The SSEF consists of 16 Elements of Care, based on the quality markers in the National Stroke Strategy and related to the stroke strategies in all four UK countries.

[UK Career Framework for Stroke Nurses June 2023, Royal College of Nursing \(Registration required\)](#)

Build your knowledge around the range of career pathways around stroke nursing and the minimum recommended education requirements, in addition to mapping your career development and assessing your skills and knowledge.

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