



BNSSG Stroke Services Reconfiguration Programme

Pre-Consultation Business Case
FINAL

Version: 3.3
24/05/2021



Version Control:

Version	Date	Owner	Action Taken/Changes Made
0.1	05/03/2020	Abigail Saville	Formatted Healthier Together template with chapter headings
0.2	10/07/2020	Jeremy Westwood	Collation of content
0.3	15/07/2020	Rebecca Dunn	Addition of more content and full edit
0.4	22/07/2020	Jeremy Westwood	Formatting amends
0.5	07/08/2020	Jeremy Westwood	Content additions
0.6	10/08/2020	Rebecca Dunn	Content amends
0.7	20/08/2020	Rebecca Dunn	Content amends
0.8	27/08/2020	Jeremy Westwood	Content amends
0.9	17/09/2020	Jeremy Westwood	Content amends
0.10	29/09/2020	Rebecca Dunn	Content amends
0.11	09/10/2020	Jeremy Westwood / Rebecca Dunn	Content additions / formatting amends / references to appendices
1.0	16/10/2020	Jeremy Westwood / Rebecca Dunn	Version submitted to Oct programme board
1.1	22/10/2020	Jeremy Westwood / Rebecca Dunn	Incorporating comments following Oct programme board – Exec summary added
2.0	22/12/2020	Rebecca Dunn	Inclusion of further options following Clinical Cabinet, DOF and CEO review w/c 14/12/2020
2.1	12/01/2021	Rebecca Dunn	Updated following feedback from Prog Board, CCG GB and Finance Review
2.2	14/01/2021	Jeremy Westwood / Rebecca Dunn	Formatting review / diagram updates / feedback from HT Exec Group
3.0	16/02/2021	Rebecca Dunn / Jeremy Westwood	Updated to reflect final system financial position and options for consultation agreed with the HT Exec Group. Submitted for NHSE stage 2 assurance.
3.1	04/03/2021	Rebecca Dunn / Jeremy Westwood	Amendments in response to assurance feedback
3.2	04/05/2021	Rebecca Dunn / Jeremy Westwood	Final Draft for GB review
3.3	24/05/2021	Rebecca Dunn	Final amendments

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Purpose of the document

The purpose of this PCBC is to present and summarise the extensive work undertaken to date as part of the BNSSG Stroke Programme, with the following purposes in mind:

- To describe the proposals for reconfiguring stroke services across the BNSSG area, and to enable decision makers to decide whether there is a case to launch a formal public consultation;
 - Demonstrating that these proposals are aligned with our shared system strategy;
 - Demonstrating that all options, benefits and impact on service users have been considered;
 - Demonstrating that the planned consultation will seek the views of patients and members of the public who may potentially be impacted by the proposals
- To inform the necessary assurance processes, evidencing the proposals meet the government's four tests of service change, patient care test (otherwise known as the 'NHS beds test'), as well as other best practice checks for planning service change and consultation.

Intended Audiences and their Decision Making Roles

This PCBC is written by the BNSSG Stroke Programme Team for the following audiences:

- The BNSSG CCG Governing Body which is the organisation that carries the legal responsibilities for public involvement duties.
- The Healthier Together Partnership Board who will support this business case and ensure that the proposals are compatible with our shared system strategy.
- The Boards of North Bristol NHS Trust (NBT), University Hospitals Bristol and Weston NHS Foundation Trust (UHBW) and Sirona Care and Health (Sirona) who will confirm organisational level support for the proposed changes to clinical services (formal approval of the case in terms of finance, workforce and implementation plans will occur post consultation)
- NHS England and Improvement (NHSEI) which will assure that these proposals have followed appropriate processes for planning service change and consultation.
- The Joint Health Overview and Scrutiny Committee (JHOSC) who will scrutinise the proposals in line with their responsibilities
- Members of the public who might be impacted by these proposals, in order to explain our proposals and gather feedback from people on these proposals which will be used to inform decision making on these proposals.

Document Status

Until published this is a confidential document for discussion purposes and any application for disclosure under the Freedom of Information Act 2000 should be considered against the potential exemptions contained in s.22 (Information intended for future publication), s.36 (Prejudice to effective conduct of public affairs) and s.43 (Commercial interests). Prior to any envisaged disclosure under the Freedom of Information Act the parties should discuss the potential impact of releasing such information as is requested.

The material set out in this document is for discussion purposes. The involved NHS bodies understand and will comply with their statutory obligations when seeking to make decisions that will have an impact on the provision of care services. The case set out does not represent a commitment to any particular course of action on the part of the organisations involved. The aim is to support continuing discussion and formal public consultation.

1. Executive Summary

Stroke is both a sudden and devastating life event and a long term condition. It's the fourth biggest killer in the UK, and a leading cause of disability. Over recent years, there have been significant advances in proven, highly effective methods of stroke treatment and care. In line with National Guidance, and with the support of NHS England and Improvement (NHSEI), the BNSSG Stroke Programme proposes a transformed stroke service to realise the vision for local people that:

Everyone in BNSSG will have the best opportunity to survive and thrive after stroke

The proposals are designed to ensure that:

- Fewer people die from stroke each year
- Expert care is provided in hospital, home and the community
- Services are high-quality and sustainable for the future

Why change stroke care in BNSSG

There are compelling reasons to change the provision of stroke care in BNSSG:

- **Demand for stroke care will increase and the specialist stroke workforce available to provide care is limited.** The population is growing, getting older, living with more long-term conditions and there will be an increasing demand for stroke care into the future. 48% of hospitals nationally have vacant stroke consultant positions and specialist stroke nursing vacancies locally have been as high as 42%. Stroke services in BNSSG need to adapt so that the available specialist stroke workforce are able to provide the best possible outcomes to those that experience a stroke.
- **The provision of stroke services varies depending on where people live in BNSSG.** Services are not organised in a way that is responsive to the needs of the population. Some of the highest risk populations in BNSSG are the most disadvantaged by the current service configuration, which restricts access to specialist treatments available for stroke at Southmead Hospital and provides inconsistent rehabilitation support across BNSSG.
- **Outcomes for people that have a stroke in BNSSG vary depending on where they receive treatment.** The Sentinel Stroke National Audit Programme (SSNAP) grades the care provided by all hospitals and healthcare systems. The hospitals in BNSSG have overall SSNAP scores of between B (Southmead Hospital) and D (Weston Hospital). BNSSG is an outlier in comparison to what many health systems achieve for their patients and in many areas this best practice has been achieved by reconfiguring to a more centralised model of specialist hyper-acute stroke care.
- **NHS commissioners have a responsibility to ensure that every pound spent on behalf of tax payers offers as much health benefit to the population as possible.** Spend across BNSSG is variable which contributes to the inconsistent service offer that people receive. When people are less independent, higher health and care costs are incurred. There is evidence that BNSSG could reduce the level of disability that people experience



following a stroke and thus reduce the costs associated with long term care for stroke survivors by reconfiguring the way its stroke services are currently provided.

Collaboration across the health and care system

To address the case for change, clinicians of all professions, people with lived-experience of stroke, voluntary sector workers, social care staff, and service managers have been working together to redesign the stroke service provided to people in BNSSG. The range of stakeholders involved is significant and includes key partner agencies, such as the Bristol Health Partners Stroke Health Integration Team, Bristol After Stroke, the Stroke Association and the West of England Academic Health Science Network. The outcome of the work is a stroke pathway for local people that is grounded in what matters most to people and delivering the best outcomes for patients. The proposals for change are directly in line with the draft National Stroke Service Model and address the current inequalities in stroke care provision across BNSSG.

A strict oversight framework has been established to support the development of the proposals and ensure rigour in development of this Pre Consultation Business Case (PCBC). Lived experience representatives are embedded in all parts of the BNSSG Stroke Programme structure to ensure that the voice of those that use and understand the current services are central to the decision making process. Early liaison with local councils has helped identify what matters most to people living in the different communities across BNSSG and detailed quality and equality impact assessments have been undertaken. The BNSSG Stroke Programme Board is focused on ensuring that the proposals for change help combat health inequalities and enable all BNSSG residents to access the same high quality services following a stroke, giving everyone the opportunity to have the best outcomes that they can achieve.

A new service model

A comprehensive new service model is put forward. The proposed model centralises hyper acute care for stroke patients at a single site in Southmead Hospital, which will have a “hyper acute stroke unit” (HASU) and become a “Comprehensive Stroke Centre” under the new National Stroke Service Specification. This means that ambulances would no longer convey people with suspected strokes to Weston Hospital’s A&E or the Bristol Royal Infirmary’s (BRI’s) A&E.

There are two clinically viable options to consider for acute care following on from the hyper-acute episode:

- **Option 1** proposes that a single acute stroke unit (ASU) is established, co-adjacent to the HASU, based at Southmead Hospital. In this Option, a specialist stroke workforce would be provided onsite at the BRI to support patients whose specialist needs mean that they cannot be transferred to the Southmead Hospital HASU/ASU (e.g. patients needing cardiac specialist support). The service model at Weston Hospital means that there are unlikely to be patients in that hospital who could not be transferred, therefore stroke patients in Weston Hospital would all transfer to Southmead Hospital.

- **Option 2** proposes that two ASUs are established, one would be co-adjacent to the HASU based at Southmead Hospital and one would be based within the BRI. The ASU based at the BRI would support patients who have other specialist needs that can only be provided on the BRI site. As above, stroke patients in Weston Hospital would all be transferred to Southmead Hospital for HASU care, but they would “step down” to the ASU at the BRI, as patients currently in the BRI catchment area would, once the HASU episode was complete.

Under the proposed changes many people will be supported directly home from hospital supported by a new integrated community stroke service (ICSS).

For those that need continued inpatient care in a stroke sub-acute rehabilitation unit (SSARU), care is desirable as close to home as possible. This has to be balanced against the available workforce. For example, a greater number of specialist staff are required in a higher number of smaller SSARU units. If adequate numbers of staff cannot be recruited, this could lead to specialist staff being spread more thinly across SSARU units, impacting on the quality of care able to be provided in each SSARU unit. Smaller units also require more flexibility in their inpatient capacity and this could lead to more stroke patients not being treated in a designated community stroke bed.

Three variations for SSARU care were reviewed in detail as part of the clinical design process: variation “a” included 3 SSARUs, variation “b” included 2 SSARUs and variation “c” included 1 SSARU. In order to balance the provision of local care, meet population health needs and ensure equity of access, with a model that consolidates the clinical workforce and is more affordable, the SSARU variation with two units (variation “b”) is put forward for consultation with the public.

The proposed options for public consultation can be seen below:

Option 1b		Option 2b	
Hyper Acute Stroke Unit at Southmead Hospital		Hyper Acute Stroke Unit at Southmead Hospital	
Acute Stroke Unit at Southmead Hospital		Acute Stroke Unit at Southmead Hospital	Acute Stroke Unit at BRI
Sub-Acute Rehab Unit	Sub-Acute Rehab Unit	Sub-Acute Rehab Unit	Sub-Acute Rehab Unit

The Clinical Senate advised that the preferred option should:

- Minimise the number of handovers in care for patients
- Most consolidated the workforce
- Improve the affordability of the proposals

Therefore, based on this, the BNSSG health system has named a preferred option: **Option 1b, a single HASU and ASU located at Southmead Hospital with two SSARUs.**

Population health information demonstrates that the population of Weston are at high risk of stroke and Healthier Together partners have therefore confirmed that one of the SSARUs should be located in the Weston area; **Weston Hospital site is therefore proposed as a fixed location for a SSARU** in the South of the BNSSG area. **The location of the second SSARU will be determined as part of the consultation process**; possible sites are South Bristol Community Hospital and the Frenchay site (with an interim location ahead of the completion of this new facility).

The development of the ICSS is viewed as a service improvement and is therefore not subject to formal public consultation. It is however a fundamental enabler of delivery of the proposed acute hospital changes and a key component of the National Stroke Service Specification, on which the proposed public consultation will seek feedback. The improvements described have been co-designed with service users and members of the public. The ICSS will also address current inequity in provision of sub-acute stroke rehabilitation.

A number of other service improvements are proposed as part of this PCBC, these can be seen below:

- The development of a comprehensive 24/7 specialised stroke thrombectomy service at Southmead Hospital. To be most effective this treatment should be provided within 6 hours of the onset of stroke.
- Provision for transient-ischaemic attack (TIA) services will be bolstered. This is integral to the service model and will preserve equity of access for rapid outpatient assessment in all areas of BNSSG with digital links to the HASU for advice and support.
- A “single stroke workforce” will be developed to offer the most operationally flexible and integrated service possible.
- The whole pathway will be supported by significant digital advancements. This will enhance the “reach” that specialist clinicians achieve beyond their immediate vicinity, supporting community services, primary care and ambulance crews in a way not currently seen.

Where the proposals for consultation are co-dependent on the service improvements, such as for the ICSS and TIA provision, the financial analysis includes the associated costs.

Benefits of the proposals for change

Under the proposed new model for stroke care in BNSSG, all patients could reach the Southmead Hospital HASU by ambulance within 45 minutes. Here they can access life-saving and life changing specialist treatment for stroke. A very small number of patients (less than 1 per week) from the south of the BNSSG area would be conveyed to Taunton as their nearest receiving A&E and stroke service.

This means that the entirety of the population of BNSSG will have access to:

- Rapid and equitable access to life-changing specialist treatment, including thrombectomy and 24/7 access to the HASU.
- Improved outcomes associated with having well-equipped, well-staffed specialist care in the most intensive acute period of treatment.

- Community based rehabilitation care provided in the home where possible and in a SSARU where necessary.
- “Life After Stroke” support delivered by a partnership between health and voluntary sector providers.

Supporting the proposed new model for stroke care in BNSSG will be a seamless pathway that focuses on maximising a person’s potential through proactive rehabilitation and patient-led goal setting, improving peoples’ independence and quality of life. The shift in focus from hospital care to community support will also improve the experience that patients and families have of the care they receive.

Financial analysis

Detailed financial and capacity planning has been undertaken, underpinned by baseline 2018/19 activity and detailed modelling of ambulance flows. The planned capacity has been tested using a simulation model, which was developed in the local health system and has been published in a peer-reviewed journal, to check and validate the operational assumptions.

Workforce requirements have been set against the proposed capacity and are broadly in line with national standards. The impact of the proposals on the total number of beds provided for stroke patients across the system shifts acute beds to community beds, with a planned reduction of 16 beds in total Option 1 and 15 beds in total in Option 2. The bed reductions have been carefully calculated via detailed capacity planning of both hospital and community provision and take into account the benefits that specialist acute intervention and enhanced support at home are expected to deliver, such as reduced hospital lengths of stay and improved outcomes that specialist interventions, such as thrombectomy, will offer.

The resultant costing exercise gives an assessment of cost for the new model compared to the current baseline position. Current planning assumptions lead to the following cost changes, against a 2018/19 baseline of £29.7m:

Option 1b	+£2.9m
Option 2b	+£3.4m

The cost increases largely arise as a result of an expanded community service and increased staffing levels to meet the national requirements for provision of 24/7 hyper acute care. Capacity vacated in the system is identified as part of the financial analysis and Healthier Together system partners have agreed that hospital space made available as part of the service changes will be reutilised through expected growth in healthcare activity.

The saving in long term care that improved stroke outcomes will achieve in BNSSG has been calculated at circa £3-£3.5m annually. This would predominantly be realised in social care and is not assumed as “releasable” within the PCBC.

Next steps

There are extensive assurance and governance requirements in order to make a system change of this scale. Full system agreement has been reached on the

proposals for consultation included within this business case and letters of support are included as an Appendix to the PCBC. The programme will work closely with NHSEI and the Clinical Senate to ensure the proposals remain in accordance with evidence of clinical best practice and operational requirements.

This pre-consultation business case has been developed with significant service user and public involvement. Further engagement and scrutiny of the proposals for change will continue to be sought, both leading up to, and as part of, the formal consultation process. This will help to ensure that service changes and improvements proposed meet the needs of the BNSSG population.

The establishment of the ICSS is scheduled to commence in April 2022, with the operational launch of the service in July 2022. This will enable the proposed hospital changes to be implemented by November 2022. The implementation of the proposals for change will be provider led and delivered via a collaboration between Healthier Together system partners and the voluntary sector.

Conclusion

The BNSSG Stroke Programme has galvanised stakeholders from all backgrounds and professions around a shared vision for stroke care for the future, which is supported by NHSEI. A single clinical model exists, within which two options for configuring service provision are put forward for consultation with the public (Options 1b and 2b). Decisions are still needed to determine the right option for implementation and to confirm the location of the second SSARU, which the consultation (scheduled to commence in June 2021) will inform.

The clinical model is aligned to the new National Stroke Service Model and is centred around the needs of the BNSSG population. Improving health inequalities is at the heart of the changes proposed. The ICSS is a step change in provision for the BNSSG communities and, working with the voluntary sector, more people will benefit from specialist stroke support that extends beyond hospital care, removing the “cliff edge” that is currently described following discharge from hospital.

This is an exciting time for stroke care in BNSSG and this PCBC presents the opportunity for the public to help inform Healthier Together decisions, which will significantly reduce the number of people that experience ongoing disability after a stroke.

2. Introduction

Stroke is both a sudden and devastating life event and a long term condition. It is the largest cause of complex neurological disability in the UK. The combination of improved treatments reducing death rates after stroke and increased stroke incidence due to an ageing population means that the combined health and social care costs of stroke are rapidly and dramatically increasing, with social care costs projected to more than triple by 2035.¹

Balanced against this are proven, highly effective methods of stroke treatment and care, developed over decades with many advances in recent years. Specialist, intensive patient care carried out in centralised “hyper acute stroke units” with rapid restoration of blood supply to the brain where possible, limits the extent of brain damage after a stroke and substantially reduces disability and death. Early, intensive specialist rehabilitation, at home where feasible and self-directed if possible, further reduces disability and preserves independence after stroke. Ongoing rehabilitation aimed towards regaining particular activities, combined with motivation and support and an enabling approach to care, allows continued and meaningful recovery long after a stroke, frequently for years.

Delivering these treatments efficiently and in a co-ordinated manner, combined with an approach to stroke and cardiovascular prevention which is structured, targeted and takes full advantage of opportunities for prevention within the post-stroke journey will be essential to maintain and improve the health and wellbeing of our ageing population. In line with National Guidance, and with the support of NHS England and Improvement (NHSEI), the BNSSG Stroke Programme proposes a transformed stroke service to realise the vision for local people that:

Everyone in BNSSG will have the best opportunity to survive and thrive after stroke

The proposals are designed to ensure that:

- Fewer people die from stroke each year
- Expert care is provided in hospital, home and the community
- Services are high-quality and sustainable for the future

2.1 Why look at stroke care in BNSSG?

In 2019/20 there were 18,706² people who had previously been diagnosed with a stroke in Bristol, North Somerset and South Gloucestershire (BNSSG). In the same

¹ Current, future and avoidable costs of stroke in the UK – Stroke association - https://www.stroke.org.uk/sites/default/files/costs_of_stroke_in_the_uk_report_-_executive_summary_part_2.pdf

² Public Health England CVD Profile- Stroke Dec 2019. <https://fingertips.phe.org.uk/profile-group/cardiovascular-disease-diabe>

period there were 1,347 admissions recorded on the Sentinel Stroke National Audit Programme (SSNAP) in the region. This means that 3-4 new people every day are living with the consequences of a stroke in Bristol, North Somerset and South Gloucestershire.³

What is a stroke?

There are two main types of stroke – ischaemic and haemorrhagic. About 85% of all strokes are ischaemic and 15% haemorrhagic (Stroke Association, 2017).

- Ischemic strokes are caused by a blockage cutting off the blood supply to the brain. This can cause damage to brain cells.
- Haemorrhagic strokes are caused when a blood vessel bursts within or on the surface of the brain. Haemorrhagic strokes are generally more severe and are associated with a considerably higher risk of dying within three months of having a stroke and beyond. When compared to ischaemic strokes, between 10-15% of people with subarachnoid haemorrhage die before reaching hospital. Subarachnoid haemorrhage is an uncommon type of stroke caused by bleeding on the surface of the brain
- Transient ischaemic attack, or TIA (often referred to as a ‘mini-stroke’ or ‘warning stroke’) is the same as a stroke, except that the symptoms last for less than 24 hours. When symptoms first start, there is no way of knowing whether someone is having a TIA or a full stroke. A TIA should be treated as seriously as a full stroke. About half of all strokes after TIA occur in the first 24 hours.

Source: The Stroke Association

Evidence from elsewhere in the country shows that outcomes for stroke patients could be improved by making changes to the way in which stroke care is organised and delivered in BNSSG. This evidence is supported by those that have experienced a stroke in the BNSSG area, who currently experience longer hospital stays than necessary as a result of specialist stroke care being limited and fragmented in the community.

The BNSSG Stroke Programme has drawn heavily on information from those with lived experience. This has included information from national surveys such as the Stroke Association ‘Lived Experience Report’⁴ as well as detailed feedback from local people which has enabled the clinically led stroke reconfiguration programme to understand what changes should be made locally to better meet peoples’ needs and ensure greater equity of care across BNSSG.

tes-kidney-disease/profile/cardiovascular/data#page/13/gid/1938133106/pat/15/par/E92000001/ati/154/are/E38000222

³ Public Health England CVD Profile- Stroke Dec 2019. [https://fingertips.phe.org.uk/profile-group/cardiovascular-disease-diabetes-kidney-](https://fingertips.phe.org.uk/profile-group/cardiovascular-disease-diabetes-kidney-disease/profile/cardiovascular/data#page/13/gid/1938133106/pat/15/par/E92000001/ati/154/are/E38000222)

tes-kidney-disease/profile/cardiovascular/data#page/13/gid/1938133106/pat/15/par/E92000001/ati/154/are/E38000222

⁴ <https://www.stroke.org.uk/lived-experience-of-stroke-report>



Some people who have experienced a stroke report feeling as though they have “fallen off a cliff” when they leave hospital; the proposals for change set out in this Pre Consultation Business Case (PCBC) will address this poor experience of care and improve the outcomes that people achieve following a stroke locally.

Primary and secondary prevention of stroke is vital for ensuring that growth in the incidence of stroke is contained. The BNSSG Stroke Programme has focussed on the clinical model associated with healthcare provision for those that experience a stroke but the importance of prevention work is recognised. Healthier Together partners already support public health initiatives targeted at lifestyle and the management of recognised clinical risk factors, such as high cholesterol, in primary care. A specific project targeted at lowering blood pressure to reduce the risk of a stroke is also being co-designed and developed with the Academic Health Science Network. This will support targeted blood pressure management through self-monitoring in the most high risk groups in BNSSG.

Stroke is firmly on the National agenda as well and NHSEI have recognised the opportunity to improve the mortality and quality of life of people who have had a stroke. The National Stroke Programme, which is a collaboration between NHSEI and the Stroke Association, supports local organisations to meet the ambitions for stroke set out in the NHS Long Term Plan and deliver better prevention, treatment and care for the 85,000 people who have a stroke in England each year.

Specifically, the National Stroke Programme aims to⁵:

- Improve post-hospital stroke rehabilitation models for stroke survivors
- Deliver a ten-fold increase in the proportion of patients who receive a clot-removing [thrombectomy](#) to end their stroke so that nationally each year 1,600 more people will be independent after their stroke
- Train more hospital consultants to offer thrombectomy in more sites, providing a national service
- Deliver clot-busting [thrombolysis](#) to twice as many patients, ensuring 20% of stroke patients receive it by 2025 – the best performance in Europe
- Enhance the [Sentinel Stroke National Audit Programme \(SSNAP\)](#) to identify further need and drive improvements across the stroke pathway, including rehabilitation
- Ensure three times as many patients receive 6 month reviews of their recovery and needs – from 29% today to 90%

In order to meet these standards, NHSEI recommends that health systems centralise acute stroke services⁶. Evidence shows that doing so can reduce mortality, length of acute hospital stay and improve provision of evidence based clinical interventions, and that the effects can be sustained over time. A draft National Stroke Service Model was released in October 2020⁷; this document describes the composition of Integrated Stroke Delivery Networks (ISDNs) and details the ISDN Pathway Specification. Whilst no ISDN is expected to be able to deliver all the elements

⁵ <https://www.england.nhs.uk/ourwork/clinical-policy/stroke/>

⁶ <https://www.england.nhs.uk/ourwork/clinical-policy/stroke/>

⁷ National Stroke Service Model, Integrated Stroke Delivery Networks (DRAFT – October 2020); NHS England and NHS Improvement

outlined in the pathway specification straight away, delivery of this “optimal pathway” within the period of the NHS Long Term Plan is expected from each stroke network. The draft ISDN Pathway Specification can be seen in Appendix 1.

Local ambitions for stroke are captured in the Healthier Together Long Term Plan, which was developed in 2019 with the following “outcomes”/improvements for stroke care in BNSSG:

- An increase in the number of people receiving high-quality specialist care,
- Improved health outcomes through increased use of thrombectomy
- Improved care through developing and implementing a new model for stroke rehabilitation and re-ablement.

An in-depth look at the need to change in BNSSG is presented in Chapter 4 “The Case for Change”. When fully implemented, the BNSSG Stroke Service will result in demonstrable improvements in clinical outcomes for people and ensure that everyone that lives in BNSSG has the same access to highly specialised life-saving interventions through a single specialist centre. The new service will improve how well local services meet National Standards and enhance performance against the SSNAP (Sentinel Stroke National Audit Programme) quality indicators; Chapter 12 details how the proposals address the case for change and where recognised quality indicators will be positively affected.

The Covid-19 pandemic response has accelerated the integration of out of hospital services and earlier discharge from hospital has been achieved for some stroke patients. The Covid-19 surge in BNSSG also brought to light inefficiencies in the current stroke pathway, such as multiple handovers of care and unnecessary transfer of patients between different health locations, which increases the risk of spreading infection. Lessons learned as part of the Covid-19 pandemic response will be built upon as part of this reconfiguration programme.

The division of the specialist consultant/medical workforce between three hospitals (Southmead Hospital, the BRI and Weston Hospital) was also brought into focus when considering resilience and contingency planning. During Spring of 2020, under Phase 1 of the NHS Covid-19 Pandemic response, earlier implementation of the centralised acute stroke service at Southmead Hospital site was considered. Fortunately this was not required but the situation remains under review. The BRI and Southmead Hospital sites did receive all stroke admissions between 25/05/2020 - 18/06/2020 when Weston Hospital closed because of a Covid-19 Outbreak. This was repeated for a short period in February 2021, where the lack of resilience of the stroke workforce at Weston Hospital meant that all stroke admissions were diverted to Southmead Hospital.

This system business case is supported by all Healthier Together partners, the voluntary sector and those with lived experience of current stroke services that the BNSSG Stroke Programme Team have worked with over the course of its development. Letters of support for the programme can be seen in Appendix 14. The next section describes in more detail how the various stakeholders have contributed to the programme of work and the development of the proposals set out for consultation.

2.2 System working and stakeholder involvement

As a Healthier Together Programme, the BNSSG Stroke Programme has involved many stakeholders. Bristol Health Partners and the Stroke Health Integration Team have been central to development of these proposals. Their links to research and education have supported outreach to key experts in public health and academia, in addition to supporting patient and public involvement. Voluntary sector providers in our local area, namely the Stroke Association and Bristol After Stroke, have also worked closely with clinicians and people with lived experience of stroke to shape the proposals throughout the course of the programme. Their experience of working with people in the local community, and across the UK, has kept the patient voice at the heart of the changes being proposed.

The governance and reporting structure for the BNSSG Stroke Programme can be seen in Appendix 2. Under the leadership of Dr Chris Burton, Medical Director at North Bristol Trust (NBT), the programme has formed a central part of the Acute Care Collaboration's strategy and work programme. The decision making process is solely for the reconfiguration of stroke services across the BNSSG area and directly related service improvements. Links have also been maintained to the Integrated Care Steering Group, recognising the interface of this work with other system priorities associated with Integrated Care, such as Frailty and the mobilisation of Sirona Care and Health from April 2020, as the single provider of community healthcare across BNSSG.

People with lived experience of stroke have been and will remain at the centre of the service design process. Engagement activities have been undertaken since before the original inception of the programme in 2017 and, since the beginning of 2020, partnership working with those with lived experience has been formalised to support the co-design and co-production process. Chapter 5 details the approach and feedback from the pre-consultation engagement and co-design process to date. From this, people have said they want to:

- Have good support after leaving hospital
- Be able to function in everyday life and to live as actively as they can
- Receive clear information
- Become as mobile as possible
- Have access to psychological support.

Clinicians (of all professions) who are involved in providing stroke care have also been integral to the development of the proposals. Partnership working between the full range of professionals involved in stroke care has enabled detailed consideration of how services should look into the future, with an eye to new and emerging developments to support and “futureproof” the proposed clinical model.

The development of options for reconfiguring BNSSG stroke services and their subsequent evaluation was clinically-led and heavily informed by people with lived experience to ensure that recommendations were made by people with a specialist

understanding of current and future treatments and service interdependencies in BNSSG. Fairness and rigour within this process was ensured through an independent chair (Prof Andrew Cant, Chair of the North East Clinical Senate); the full clinical evaluation process is detailed in Chapter 6.

Public and staff engagement will continue throughout the public consultation to ensure the final clinical model achieves maximum benefit for the population of BNSSG. Feedback on draft proposals has been gained from the Health Overview and Scrutiny Committee (HOSC) Chairs in all the Local Authority areas. An overview of the briefings held to date is provided in Chapter 14 and, to date, there is support for the work, with a recognition from HOSC Chairs that the proposed changes will improve access to life saving treatment for stroke and longer term stroke rehabilitation care for BNSSG residents.

The BNSSG Stroke Programme Team will approach the BNSSG Joint Health Overview and Scrutiny Committee (JHOSC), which is a “committee in common” between the three Local Authorities, in March 2021 to confirm their support for the BNSSG CCG to proceed to public consultation on these proposals in June 2021. The JHOSC will be asked to review the PCBC, which includes the consultation plan and evaluation of the pre-engagement activities. Comments from the JHOSC members will be used to inform and further develop the consultation plan in advance of the consultation commencing. As part of the engagement process, links are also being made with the Somerset Health Overview Scrutiny Panel (HOSP), so that they are kept informed of the proposals that are being developed in BNSSG and are able to consider the impact on Somerset residents.

Further to the above, the Stroke Association and Bristol After Stroke have been active partners in the development of the integrated community stroke service model and the role that the voluntary sector will play in the future service model is described in more detail in Chapter 10, where the proposed new Integrated Community Stroke Service (ICSS) is described.

The Covid-19 response enabled the local voluntary sector offer to be supplemented and additional resources were put in place to help provide emotional and social support to those that had been discharged early from hospital. This has provided an opportunity to “test and learn” what an expanded voluntary sector offer could do and the evaluation of this additional investment will shape the final proposal put forward for decision. The programme team has been supplemented by an additional position dedicated to “Engagement and Quality Improvement” that the Stroke Association has funded to support the development of the system wide proposals for change and the continued implementation of local service improvements.

2.3 Scope of the Pre Consultation Business Case (PCBC)

The PCBC is a technical document that outlines the proposals put forward for consultation with the public. It will be published in the public domain and is intended for a broad audience of Healthier Together ICS and partner Boards and Decision Making Groups, members of the JHOSC, and members of the public who will be impacted by the changes proposed.

The purpose of the document is to:

- Describe the proposals for reconfiguring stroke services across the BNSSG area, and to enable decision makers to decide whether there is a case to launch a formal public consultation;
 - Demonstrating that these proposals are aligned with our shared system strategy;
 - Demonstrating that all options, benefits and impact on service users have been considered;
 - Demonstrating that the planned consultation will seek the views of people with direct experience of stroke and stroke services, and members of the public who may potentially be impacted by the proposals
- Inform the necessary assurance processes, evidencing that the proposals meet the government's four tests of service change, the patient care test (otherwise known as the 'NHS beds test'), as well as other best practice checks for planning service change and consultation.

Prior to a consultation commencing, materials that are more accessible to the general public will be developed so that the key messages can be easily understood and Healthier Together system partners can benefit from a broad range of feedback to inform their decision making. The public consultation is planned to run from June 2021 (following the purdah period in Bristol) and decision making on the proposals will happen in the latter part of 2021.

The PCBC describes the process by which the proposals for change have been developed, outlines the engagement that has been undertaken with those with experience of using stroke services in BNSSG, and with staff involved in the running of the current service, demonstrates the system-wide governance that sits behind a complex programme of this scale, and the financial and workforce models that are associated with implementing the changes proposed. The work has drawn on a wide range of information and expertise – from system-wide data on population health to the views and experiences of individuals, for which the health service could have done better for, and expert clinicians and patients who are involved in national developments in stroke and are supporting the local work.

The proposals for consultation in this PCBC cover:

- **Immediate treatment:** it is proposed that all patients with a suspected stroke, will be taken to a single hyper-acute stroke unit (HASU). Ambulance crews, and staff at other hospitals will have diagnosis support and a secure-video link to a Telemedicine team at the HASU. To maximise the benefits of these changes, this will be supported by public education on stroke symptom awareness including non-FAST symptoms, to reduce the time taken for people to seek help after a stroke, increasing the number of people eligible for thrombolysis and thrombectomy treatment. Services will be organised so that people suffering a stroke in Weston Hospital, Bristol Royal Infirmary, Bristol Heart Institute, St Michael's Hospital or the Bristol Haematology and Oncology Centre will have timely access to immediate treatment, with transfer to Southmead Hospital as required.

- **Changes in hospital provision:** it is proposed that the single HASU with specialist thrombolysis and thrombectomy services, allied to neurology and neurosurgical services, will be introduced at Southmead Hospital, North Bristol Trust, (NBT). Options for acute care have been clinically evaluated and two options are put forward for consideration:
 - Option 1: proposes that a single Acute Stroke Unit (ASU) is established that would be, co-located with the HASU based at Southmead Hospital to provide a fully centralised specialist acute stroke service for BNSSG. Stroke care on other hospital sites would be delivered by a combination of onsite and remote specialist stroke support.
 - Option 2: proposes that two ASUs are established, one would be co-located with the HASU at Southmead Hospital (as in Option 1) and one would be based at the Bristol Royal Infirmary (BRI). This additional ASU would also provide a physical base from which to support inpatients under other specialities (e.g. Bristol Heart Institute) who cannot be transferred to Southmead Hospital for specialist stroke care, and for patients with other neurological disorders requiring specialist rehabilitation. Both ASU's would be supported by the single HASU proposed at Southmead Hospital.

Both of these options mean that hyper-acute care is centralised in line with National Guidance and that acute care is more centralised than at present to consolidate the skilled workforce, thereby improving outcomes for patients, both in terms of mortality and morbidity from stroke.

- **The location of inpatient sub-acute rehabilitation units (SSARUs):** Inpatient SSARU care is desirable in all three Local Authority areas in order to provide care as close to home as possible and maximise the opportunity for seamless care between health and social support to people following a stroke. However, this has to be balanced against the available workforce and the capacity to accommodate fluctuations in demand. For example, a greater number of specialist staff are required in a higher number of smaller SSARU units, and if adequate numbers of staff cannot be recruited this could lead to specialist staff being spread more thinly across SSARU units, impacting on the quality of care able to be provided in each SSARU unit. Smaller units also require more flexibility in their bed capacity and this could lead to more stroke patients not being treated in a designated community stroke bed. For this reason, variations “a”, “b” and “c” were considered under Options 1 and 2:
 - **Under variation “a”**, 3 SSARUs were considered, one situated in each Local Authority area, utilising existing/planned NHS estate.
 - **Under variation “b”**, 2 SSARUs were considered; the location of these would need determine by population need and utilise existing/planned NHS estate.
 - **Under variation “c”**, 1 SSARU was considered; the location would need to accommodate all SSARU beds in one location, be placed somewhere accessible to the entire BNSSG region and utilise existing/planned NHS estate.

SSARU variation “b” has been assessed as bringing the most benefits to patient care because it offers the greatest consolidation of the specialist

stroke workforce and helps improve the affordability of the proposals, whilst still ensuring access across the BNSSG geography.

The three SSARU variation (variation “a”) is not included in the options for public consultation because three units require more staff and there is a risk that adequate workforce would not be available, which would impact the quality of care that could be provided to patients. As a result of the additional workforce needed, the cost of this option was also deemed prohibitive by the Acute Care Collaboration and Healthier Together Executive Group.

The single SSARU option (variation “c”) is not included in the options for public consultation because a single SSARU would not be accessible to the population of BNSSG. Also, accommodating all SSARU beds in one location using existing/planned NHS estate was not deemed to be deliverable by the Acute Care Collaboration and Healthier Together Executive Group.

The proposed options for public consultation can be seen below:

Option 1b		Option 2b	
Hyper Acute Stroke Unit at Southmead Hospital		Hyper Acute Stroke Unit at Southmead Hospital	
Acute Stroke Unit at Southmead Hospital		Acute Stroke Unit at Southmead Hospital	Acute Stroke Unit at BRI
Sub-Acute Rehab Unit	Sub-Acute Rehab Unit	Sub-Acute Rehab Unit	Sub-Acute Rehab Unit

Based on advice from the Clinical Senate (whose full report can be seen in Appendix 15), a preferred option that reduces handovers in care for patients, most consolidates the workforce and improves the affordability has been identified by health system partners. This is **Option 1b: a single HASU and ASU located at Southmead Hospital with two SSARUs.**

Population health information demonstrates that the population of Weston are at high risk of stroke and Healthier Together partners have therefore confirmed that one of the SSARUs should be located in the Weston area; **Weston Hospital site is therefore proposed as a fixed location for a SSARU in the South of the BNSSG area.**

The location of the second SSARU will be determined as part of the consultation process; possible sites are South Bristol Community Hospital and the Frenchay site (with an interim location ahead of the completion of this new South Gloucestershire facility).

In addition to these proposals on which public consultation is recommended, there are a number of service improvements proposed, these will bring the quality of the local service provision up and meet the requirements of the draft National Stroke Service Model:

- **A new Integrated Community Stroke Service (ICSS):** This service will address longstanding and substantial variation in community stroke services across BNSSG. Irrespective of the location of the two SSARUs, there will be a single, multidisciplinary, pan-BNSSG service that co-ordinates the early transfer of care of people from an acute hospital setting to the most appropriate destination for their care needs. The service will provide specialist stroke rehabilitation and care in a variety of community settings, focussing on supporting service users and their families and to develop and maintain as much independence as possible and empowering people to manage their own health. The service will include the voluntary sector to enhance emotional and psychological support after stroke. It will also be integrated with social care in order to provide a seamless service between agencies, reduce handovers in care and provide equal and improved access to specialist stroke rehabilitation and support across BNSSG.
- **TIA clinic provision:** Prompt (within 24 hours) intervention after TIA can reduce stroke rates by up to 80%. Clinicians have therefore recommended that TIA clinic provision is made available in Weston Hospital and at the BRI, in order to ensure accessibility across BNSSG. Where patients have already been conveyed to hospital, management will be implemented before discharge. This service will be centrally administrated and managed with remote networking to the HASU for specialist clinical support and/or access to immediate diagnostics identified as required post-TIA.
- **Thrombectomy provision:** Mechanical thrombectomy is effective at preventing severe disability and is highly cost-effective⁸. It is a highly specialist type of treatment for people who have had a type of stroke described as a proximal occlusion of a large cerebral artery such as the internal carotid or middle cerebral arteries. This type of treatment uses a minimally invasive technique that mechanically removes the blood clot from the brain to restore blood flow. It requires highly specialist staff and imaging technology to deliver the procedure. The clinical benefits of providing a mechanical stroke thrombectomy service are well supported by evidence, and have been formally recognised by NHSEI as a priority for specialised commissioning. NBT are developing the mechanical thrombectomy service provided at Southmead Hospital, with a plan to extend the provision to a 7 day service as soon as the necessary funding from specialised commissioning becomes available and to further develop this service to be 24/7 by 2022/23. Maximising the number of patients who are brought directly to a service with onsite thrombectomy will increase the percentage of patients for whom this treatment is available.
- **Development of a single stroke workforce:** The system needs a stroke workforce of sufficient numbers and skills to ensure that every stroke patient and survivor, regardless of where they live, gets the best quality treatment, care and support. A shortage of professionals trained in specialist stroke care is seen both nationally and regionally⁹. To support the service to recruit successfully and

⁸ Ganesalingam, J. e. (2015). Cost-Utility Analysis of Mechanical Thrombectomy Using Stent Retrievers in Acute Ischemic Stroke. *Stroke*, Sep;46(9):2591-8

⁹ What we think about: The stroke workforce – Stroke Association 2019, Accessed: https://www.stroke.org.uk/sites/default/files/new_pdfs_2019/our_policy_position/psp_stroke_workforce.pdf

enable the smooth transition from the current service configuration, a single clinical and managerial approach across BNSSG is recommended. This “single stroke workforce” is explained in more detail in Section 10.4. It will support the delivery of an effective and efficient service which will be able to adapt to future requirements across the pathway, help retain existing specialist stroke staff and attract new people who want to work at the forefront of specialist stroke care in the UK.

- **Digital technology:** Digital healthcare is accelerating nationally and regionally across all aspects of the stroke pathway, NHSEI are in the process of developing specifications with direct support from the regional digital team. Through linking with the regional team, BNSSG are collaborating to incorporate planned advancements in a number of digital areas. More detail is described in section 10.5.

There are also important interdependencies with other services and Healthier Together work programmes. These are out of the scope of the BNSSG Stroke Programme but the interface of these programmes of work/services with the provision of stroke care is important to understand. The key interdependencies and the impact on the proposals for stroke care, including key assumptions included within this business case, are outlined in Chapter 9.

Whilst the BNSSG Stroke Programme focuses on the configuration of hospital and community care and the stroke service provision that is recommended for change, the programme recognises the need to work to prevent the rising incidence of health conditions that increase the risk of stroke across the population. Population health management data combines information from primary and secondary healthcare and local authorities so that risk factors (which are broadly the same as those for coronary vascular disease and dementia and include age, blood pressure and cholesterol levels) across BNSSG can be assessed. This helps target interventions to specific parts of the population, where the most impact is likely to be seen. This approach will enable the much needed work on stroke prevention to be more effective. Chapter 6 supported by Appendix 3, provides an overview of the BNSSG population health management data and describes some of the work that is supporting the prevention of stroke in this area. In Chapter 7, it can be seen how population health management information has been used to shape the proposals for consultation.

Prevention will help contain growth in the prevalence of stroke across the area but it will not stop strokes from occurring. BNSSG, therefore, must ensure it is able to achieve the very best outcomes for stroke patients in order to keep as many people as possible living independently in “life after stroke”. High level analysis of the cost of providing long term care to those that are most disabled following a stroke supports the case for change and demonstrates that by investing in healthcare, long term costs associated with caring for those left with disability after a stroke can be avoided. Clinicians, and those with lived experience of stroke, unanimously agree that a more centralised and seamless service that gets stroke patients the most effective treatment as rapidly as possible, will ensure that local healthcare provision is best equipped to cope with rising demand.

3 Background

3.1 Stroke Care in BNSSG

3.1.1 Stroke incidence nationally:

Stroke has a devastating and lasting impact on people's lives and on the nation's health and economy. Over 100,000 people have a stroke in the UK every year. Stroke is the fourth most common cause of death and the leading cause of adult disability. In the UK, there are over 1.2 million stroke survivors: two thirds leave hospital with a disability, half of whom remain dependent on others.¹⁰ Nearly 14% of strokes are fatal within the first 30 days and 36% lead to death within a year.

Inequalities exist between different population groups in the UK: Men, older people, black ethnic groups, and those of lower socioeconomic status have higher risk of stroke. Stroke is more common in men (51%) than women (49%) except in the highest age range. Stroke incidence increases with age: 3% of the total strokes occurred in people aged under 40, 38% in people aged 40 to 69, and 59% in people aged over 70. However, statistical trends show that strokes are occurring at an earlier age: age at onset fell from 70.5 to 68.2 in males and 74.5 to 73 in females between 2007 and 2016. People of black ethnic origin have almost twice the incidence of stroke as white people, experience more severe strokes and are liable to have their first stroke up to 11 years earlier. Around 80% of stroke patients came from socio-economically deprived backgrounds. 75% of patients with acute stroke admitted to hospital in the UK have at least one co-morbidity and one in ten have at least three.

The cost of an individual having a stroke was estimated in 2015 to be £45,000 over the first year and £25,000 in subsequent years. This means that stroke costs the UK society around £25.6 billion each year. 57% of this sum is incurred by informal carers (relatives and friends), 29% is borne by the NHS, 11% by social care, and 3% is attributed to productivity loss. Due to predicted rises in the number of older people in the population and the expected improvements in care provision, the number of stroke cases are expected to rise by almost 50% and survivors by one third. As a result, the corresponding overall cost of care will almost triple by 2035 to £75 billion.

Deaths related to stroke have declined by 49% in the past 15 years. This has been accredited to a combination of better prevention and earlier and more advanced acute treatment.¹¹ There is an increasing national evidence base indicating that the centralisation of hyperacute stroke services improves patient outcomes through better access to thrombectomy, thrombolysis and specialised acute care, leading to fewer deaths and less disability for survivors.¹²

3.1.2 Stroke numbers and outcomes for people locally

¹⁰ Stroke Association, State of the Nation, 2018.

¹¹ Stroke pathway – Evidence Base Commissioning: An Evidence Review for NHS England and NHS Improvement, March 2020

¹² <https://evidence.nihr.ac.uk/alert/centralising-stroke-services-can-save-lives/>



Mortality rate

Based on evaluation of reconfigured stroke services in London and Manchester, the recent National Institute for Health Research (NIHR) report 'Centralising stroke services can save lives' concludes that: '*Centralising immediate 'hyperacute' stroke care for as many people as possible in specialist 24/7 Hyperacute Stroke Units (HASUs) reduces mortality by about 1%.*'¹³

Centralising Hyperacute care reduces mortality by about 1%...

There were 1,561 acute stroke admissions in 2019/20 in BNSSG, of whom 139 people died (8.9% mortality).

A one percentage point improvement in mortality would have resulted in **15 fewer deaths.**

Specialist stroke unit care

Referring to both HASU and Acute Stroke Unit (ASU) care, the Cochrane review 2020 'Organised inpatient (stroke unit) care' states: '*For every 100 people who are treated on a specialist stroke unit instead of general medical wards, six more people are independent a few months after their stroke.*'¹⁴

Specialist stroke unit treatment enables more people to be independent after their stroke...

In BNSSG in 2019/20, 221 people did not immediately receive treatment in a specialist stroke unit at one of the three hospitals that currently treat stroke patients. Immediate treatment in a specialist stroke unit would have enabled:

13 more people to be independent a few months after their stroke.

Thrombectomy

Thrombectomy is a very effective treatment for the most severe strokes. In agreement with international research evidence, 1 in 6 people treated by thrombectomy at Southmead Hospital are discharged from hospital with the same level of independence that they had before their stroke.¹⁵ Approximately 10% of stroke admissions are eligible for thrombectomy each year.¹⁶

¹³ <https://evidence.nihr.ac.uk/alert/centralising-stroke-services-can-save-lives/>

¹⁴ <https://www.cochrane.org/CD000197/organised-inpatient-stroke-unit-care>

¹⁵ SSNAP data 2018/19

¹⁶ Stroke pathway – Evidence Base Commissioning: An Evidence Review for NHS England and NHS Improvement, March 2020

Thrombectomy treatment enables more people to be independent after their stroke...

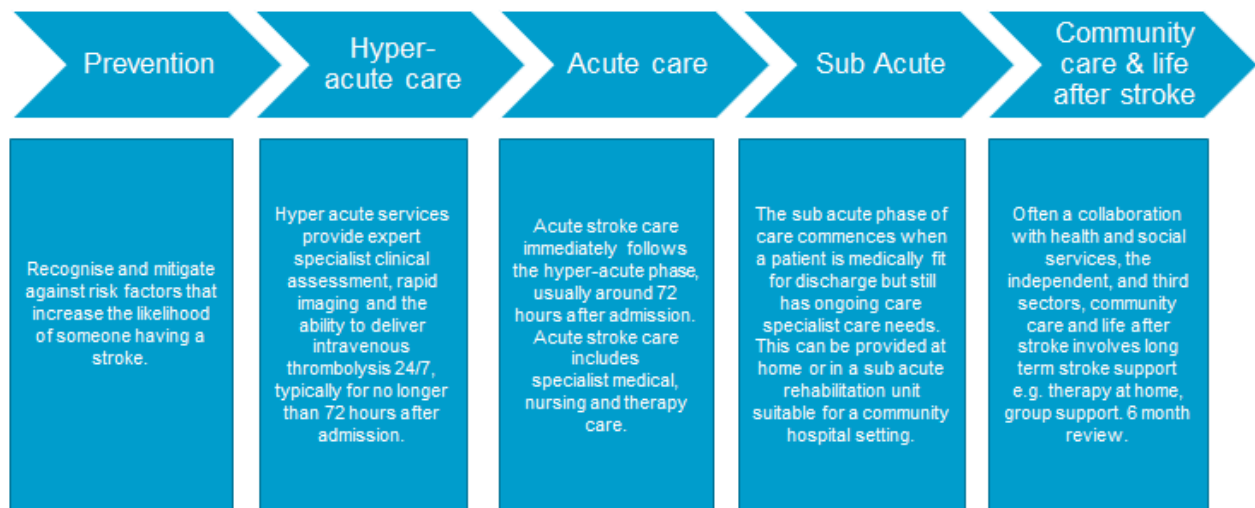
38 thrombectomies were carried out in 2019/20 at Southmead Hospital (2.6%)

If BNSSG's thrombectomy rate had been increased to 10%, 143 more people would have received treatment and 1 in 6 of these, **23 people would have been discharged from hospital with the same level of independence that they had before their stroke**

3.1.3 Current pathway

The BNSSG Stroke Programme has divided the stroke pathway into five distinct phases, as shown in Figure 1.

Figure 1 - Five Phases of Stroke Care



Rehabilitation takes place across all four post-stroke phases of the care pathway and usually starts immediately following acute treatment for the onset of a stroke.

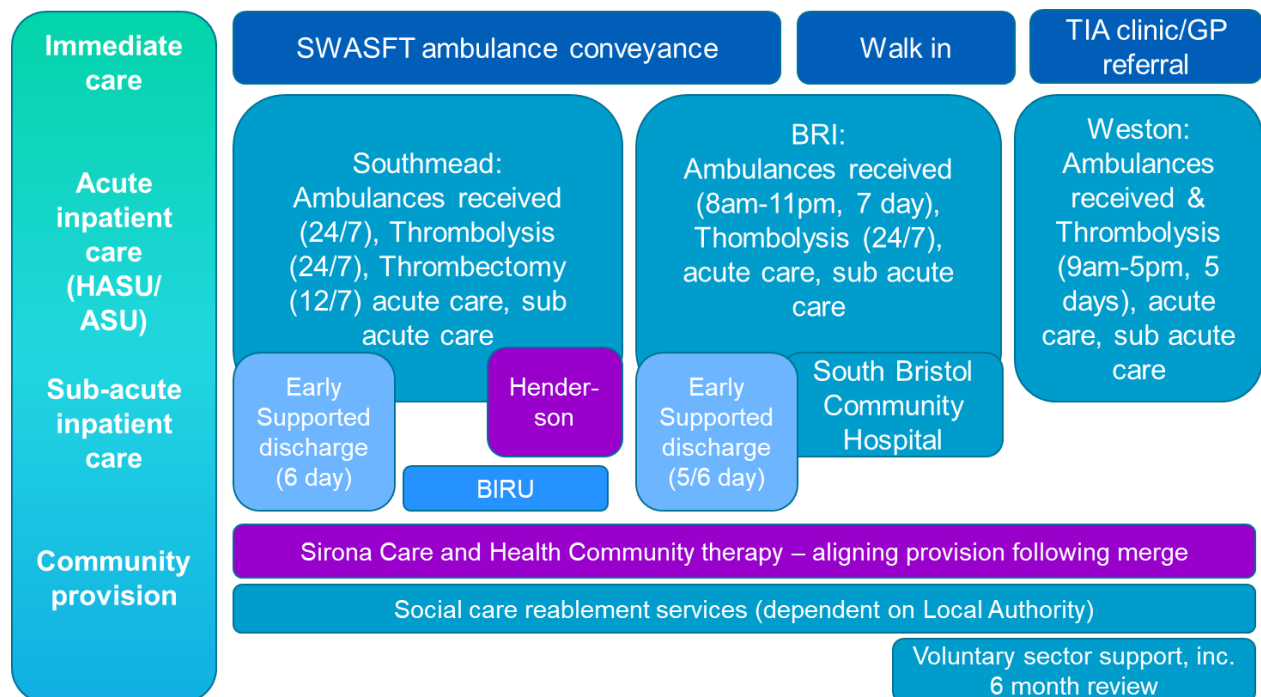
In BNSSG, care provision for stroke is currently extremely variable and, whilst there are commonalities in service provision, services have developed locally across three hospitals, three community providers and three local authority areas. Access to specialist expertise, staff availability and facilities vary significantly, depending on where your care pathway commences and which part of the BNSSG area you come from. A visual overview of the current service provision in BNSSG can be seen in Figure 2.

Despite BNSSG having a supra-regional thrombectomy centre at Southmead Hospital, there is no designated Hyper Acute Stroke Unit (HASU) and suspected strokes are taken to the closest one of three acute hospitals: Southmead Hospital, Bristol Royal Infirmary (BRI) and Weston Hospital. Each of these hospitals provides consultant-led acute care, including thrombolysis. However, Weston Hospital does not accept suspected stroke patients conveyed by ambulance after 5pm (or at

weekends) and the BRI does not accept patients after 11pm. Patients that make their own way to the Emergency Departments in the BRI and Weston Hospital outside of these hours are assessed and managed or transferred as required.

The level of involvement in senior staff in acute care also varies across the week, and thrombectomy is currently available during week days only. Patients typically receive immediate acute treatment and then undergo continued observation, treatment and start their recovery on an acute stroke ward at one of the hospitals and need to be transferred to Southmead Hospital for more specialist care such as thrombectomy or neurosurgery after an inevitable delay.

Figure 2 - Depiction of current service provision in BNSSG



Specialist Early Support Discharge (ESD) services are provided by NBT & UHBW for patients in the South Glos & Bristol areas. There is very limited in ESD in North Somerset, only that provided in the north of the area by NBT. Stroke rehabilitation beds are provided in South Bristol Community Hospital (SBCH) as well as in the acute wards themselves in all three hospitals and a small “test and learn” pilot in a nursing home in Thornbury (Henderson Ward) has four beds that are currently dedicated to stroke care. Outside of this, there are currently no community inpatient beds provided for stroke care.

People with rehabilitation and care needs after stroke are supported short term by the Home First/Discharge to Assess (D2A) teams to facilitate discharge, but at present there is no consistent approach, or joint working, to this support this across BNSSG. This may be working jointly with the ESD teams or stroke skilled therapists from the community teams. If long term care needs are identified then there is a handover to social care services in the local authorities in Bristol, North Somerset or South Gloucestershire.

Until the end of March 2020, ongoing community based rehabilitation was provided by three different community providers and was originally commissioned through three different Clinical Commissioning Groups. This has led to very different service offers that interface with local authority care provision in very different ways. Merging of the three CCGs has enabled pan-BNSSG commissioning of community health care and from the 1st April 2020, the new single community provider, Sirona Care and Health, has started working to develop a single service.

The merger of University Hospitals Bristol NHS Foundation Trust with Weston Area Health Trust to create University Hospitals of Bristol and Weston NHS Foundation Trust, has also reduced the number of organisations providing hospital stroke care and joint working to develop greater consistency of service between the BRI and Weston is also underway.

3.1.4 COVID-19 response and the impact on local stroke services

As a result of restructuring hospitals to manage the expected surge of COVID-19 cases and to meet ongoing infection prevention and control measures, new discharge pathways for stroke patients were rapidly developed to reduce length of stay on acute units. These changes provided an opportunity to pilot discharge protocols that will be used to manage the shorter acute hospital stays associated with the proposals for reconfiguration.

Specifically, the stroke response to Covid-19 included:

- **Stroke pathways through community Integrated Care Bureaus (ICBs):** discharge processes were moved from an acute to a community setting as part of the Covid-19 response. Stroke patients were directed through these routes with operational detail/flow and governance process agreed across the system. Specialist Multidisciplinary Team (MDT) links across health, social care and the voluntary sector were established and will form the basis of the Integrated Community Stroke Service.
- **Brain Injury Rehab Centre (BIRU) discharge pathway:** established to support the earlier discharge of people still requiring inpatient care and to make best use of local capacity. Only very low numbers of people used this pathway, however there are now system referral methods in place, including operational detail and patient flow, governance arrangements and contractual implications agreed. This care pathway can therefore be reinstated if/when required. Work with NBT has also established support from their early supported discharge (ESD) team to offer stroke specific follow-up to people that are discharged from BIRU.
- **Expansion of voluntary sector offer across BNSSG:** The Stroke Association and Bristol After Stroke collaborated with acute and community health providers to determine the additional demand for emotional support, peer support and information provision likely to be seen as a result of earlier discharge from hospital. Capacity for more referrals of patients in the community was established.

A number of adverse impacts have also been experienced as a result of the COVID-19 response. Specifically, some stroke discharges have been delayed and an increased length of stay has been seen for those that would have benefited from early supported discharge, due to the lack of community rehab team input (community rehab team had been diverted into generic “Discharge to Assess” (D2A) pathways). These risks, identified at the time of the first wave by the stroke Clinical Design and Delivery Group, remain unmitigated as the pandemic response continues to pressurise health service provision.

3.1.5 The BNSSG Stroke Programme

Stroke care in the BNSSG area was identified as a priority in May 2016. The merger of Bristol, North Somerset and South Glos CCGs to create BNSSG CCG and the development of the ‘Healthier Together’ Sustainability and Transformation Partnership (STP) provided a platform on which stroke service development could be taken forward. A Stroke Reconfiguration Programme Board was established in 2016 to lead the redesign of the entire care pathway.

To support this, a collaboration of academics, clinicians and commissioners from the BNSSG health and care system applied to Bristol Health Partners to establish a Stroke Health Integration Team (HIT). The Stroke HIT supports the work of the programme board and adds value particularly by involving people affected by stroke and through its programmes of research and service evaluation, and workforce and public education and training.¹⁷

North Somerset Healthwatch carried out a Special Inquiry in 2015, which found that stroke survivors in North Somerset reported feeling unsupported and faced long waits for therapies and support on discharge from hospitals in Bristol. They also felt that they received less information on discharge, compared to patients living in Bristol. Particular barriers were reported by people with aphasia.¹⁸

Similarly, early engagement with patients and carers by the Stroke Pathway Review Project identified that people experience a disjointed pathway where community services are under-developed and therefore patients feel inadequately supported either on leaving hospital or exiting time-limited Early Supported Discharge services.¹⁹

In the Spring of 2019, a clinically led evaluation process recommended that a HASU was situated at Southmead Hospital (NBT) with a co-located ASU. The evaluation used established evaluation criteria that had been reviewed and supported by Healthier Together, Health Overview and Scrutiny Committees (HOSC) and members of the public through the Healthy Weston Programme, which was publically consulted on in 2019. The evaluation criteria can be seen in Appendix 4; more information regarding the clinical evaluation process and how this was conducted is detailed in Chapter 6.

¹⁷ <https://www.bristolhealthpartners.org.uk/>

¹⁸ Healthwatch North Somerset Special Enquiry Stroke Community Services, April 2015

¹⁹ Draft Stroke Outline Business Case July 2017

In February 2020, a similar process was used to evaluate the clinical options for the number and location of ASU(s) and sub-acute specialist stroke rehabilitation facilities was undertaken. Two clinically appropriate options were identified to be worked up in detail in before the final proposal for service reconfiguration is presented in a Decision Making Business Case (DMBC). The two options described in Chapter 8, are now proposed for consultation with the public, prior to final decision making through the Healthier Together Partnership Board.

As part of the BNSSG Stroke Programme, a significant amount of attention has been given to service improvements that are recommended to be progressed across the system irrespective of changes to hospital provision. These are described in more detail in Chapter 10.

4 The Case for Change

There is compelling evidence associated with why it is necessary to take forward the proposals to change stroke services in the BNSSG area. This chapter examines the evidence against four key reasons why proposals for improvements to stroke provision in the area must be taken forward:

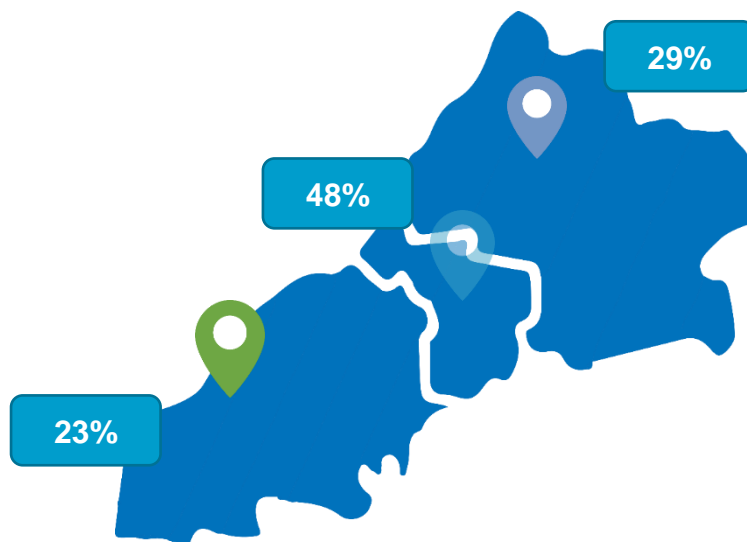
4.1 Demand for stroke care will increase and the specialist stroke workforce available to provide care is limited

The population is growing, getting older, living with more long-term conditions and there will be an increasing demand for stroke care into the future. Stroke services in BNSSG need to adapt so that the available specialist stroke workforce are able to provide the best possible outcomes to those that experience a stroke.

The population of BNSSG is made up of almost one million people and the population is diverse and changing.

- 48% live in Bristol, 23% in North Somerset and 29% in South Gloucestershire Local Authorities (LAs) (Figure 3).
- Bristol has a much younger population (median age 32 years), than North Somerset (45 years) and South Gloucestershire (40 years).²⁰

Figure 3 - Population split across Bristol, South Gloucestershire and North Somerset



Population growth across the region is not uniform with greater increases in the growth of the older population. For example, population growth from 2001 to 2017 was greatest for over 85 year olds (41%) and 65-74 year olds (27%).²¹ The greatest risk factor for stroke is age with the largest number of people who have strokes aged 55 or over. As people get older, the risk of stroke increases so with a growing older

²⁰ Office for National Statistics 2017 mid-year estimates.

²¹ Office for National Statistics

population, there will be a greater demand for stroke services in BNSSG. It is estimated that the number of stroke survivors living in the UK will rise by a third by 2035.²²

Across BNSSG, 10% of people are from a black or minority ethnic (BME) background though there is considerable variation across the region and within age groups. In Bristol, 16% of people are from a BME background, which rises to nearly 60% in Lawrence Hill ward, compared with 2.7% in North Somerset. Black people are almost twice as likely to have a stroke as white people.²³ Studies also suggest that black and South Asian people tend to have strokes ten years earlier than white people.²⁴

The health of the local population is also changing. More people are living with long term health conditions, especially frail and elderly people. Modifiable risk factors for stroke include high blood pressure (hypertension), diabetes, and atrial fibrillation.²⁵ Related to these risk factors are rates of smoking, obesity, alcohol consumption, drug use and physical exercise.

Smoking is a major risk factor for stroke. The number of smokers in Bristol is falling. In 2017, 11.1% of Bristol adults smoke, down from 21% in 2012²⁶. This compared to the 2017 national average of 14.9%, with women significantly less likely to smoke than men. Local Quality of Life Survey data shows the number of households with a smoker is 21.6%. However, this is significantly higher in the most deprived areas (29.1%). Variation across Bristol City is from 3% of households in Hotwells and Harbourside to 40% in Hartcliffe & Withywood.

For North Somerset, the level of smoking has been estimated at 16.3% with smoking prevalence ranging from 40% in Weston-super-Mare south to 10% in Clevedon Walton. In South Gloucestershire 13.9% of adults smoked in 2014, and this has reduced to 11.2% of adults in 2019.

Deprivation in BNSSG is generally lower than the national average however there are significant differences between areas. People living in more deprived areas experience comparatively poor health, with a life expectancy considerably lower than those living in the more affluent areas. The difference in life expectancy between the most and least deprived areas of BNSSG is 6.3 years. Bristol's JSNA (2018) stated that crude rates of recorded hypertension vary across the city, with highest rates in the South and North & West (outer), and lowest in North & West (inner) and the Inner City.

There are many social determinants of health that contribute to health inequalities including housing, income, education, social isolation and disability, all of which are

²² Stroke Alliance for Europe

<https://www.stroke.org.uk/sites/default/files/theburdenofstrokeineuropereport.pdf>

²³ Wang Y, Rudd AG, Wolfe CD (2013). Age and ethnic disparities in incidence of stroke over time: the South London Stroke Register. *Stroke* 44:3298-3304

²⁴ Banerjee S., Biram R., Chataway J., Ames D.(2009) South Asian Strokes: lessons from the St Mary's Stroke database. *QJM: An International Journal of Medicine*, Volume 103, Issue 1, 1 January 2010, Pages 17–2

²⁵ Stroke Association, State of the Nation, 2018.

²⁶ Annual Population Survey (APS) 2016, via PHOF, Feb 2018

strongly affected by economic and social status. Patients from the lowest socioeconomic groups have their first stroke a median of seven years earlier than those from the highest.²⁷ Other wider determinants of health, including learning disability and mental illness are also risk factors for stroke.

The statistics on population health are indicating that demand for stroke care will continue to increase. To support this, the specialist workforce will be required to grow and there are already significant challenges recruiting and retaining specialist stroke staff in BNSSG:

- The availability of specialist medical staff to diagnose and treat patients varies significantly across the geography of our region and the time of the week. Patients are less likely to be assessed by a Stroke Consultant if they arrive at hospital at night or at the weekend. This is because hospitals in the area find it challenging to recruit enough specialist stroke doctors, including consultants, making it difficult to provide senior specialist input to stroke patients at all times of the week especially new arrivals at hospital. This is exacerbated by the need to staff three acute stroke units 24/7, including on different sites and at times of the day where demand is very low due to low patient volumes.
- Difficulty in recruiting specialist stroke staff is an issue across the country. 48% of hospitals have a vacant Stroke Consultant position and the availability of specialist nursing and therapy staff to provide care to people who have had a stroke varies significantly across the hospitals in the region.
- The availability of specialist trained nursing staff improves mortality outcomes after stroke²⁸. In local hospitals, registered nurse vacancy rates in stroke units range from 12% to 42% depending on the hospital and time of the year. This contributes to the variation in the proportion of patients assessed by a nurse trained in stroke management within 24 hour of arrival in hospital from 80% to 88% across BNSSG, with the best practice target being over 95%.²⁹
- The Registered Nursing workforce has particular vulnerabilities currently due to significant vacancy factors across the 3 acute sites (approximately 35% for Band 5 nursing). Health Care Assistants are easier to recruit and there are lower vacancies across the system however a consistent and flexible deployment of these staff is needed to ensure that staff are able to be deployed to support the patient pathway across all areas.

4.1.1 What does this mean for our services?

BNSSG needs new ways of delivering specialist stroke care that maximises the reach of the specialist stroke workforce to meet the rising demand that this service will see into the future. New models of care are required that create greater

²⁷ 2018, The Lancet, [https://www.thelancet.com/journals/lanpub/article/PIIS2468-2667\(18\)30030-6/fulltext](https://www.thelancet.com/journals/lanpub/article/PIIS2468-2667(18)30030-6/fulltext)

²⁸ 2014 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4138029/>

²⁹ SSNAP 2019

operational flexibility across the geography of the area and across the patient pathway so that specialist clinical skills can be directed to where they will have the greatest impact on outcomes for patients. This cannot be achieved in a decentralised service model that is fragmented between different healthcare providers.

To address health inequalities, the local healthcare system needs to work closely with partners including local authorities and the voluntary sector to improve the availability of services in the most at risk communities. In stroke care, this includes making time-critical, life changing interventions, such as thrombectomy and thrombolysis, available equitably to the population of BNSSG and ensuring that long term rehabilitation, that will support individuals to achieve the best outcome they can, is available to everyone that needs it. This will ensure that as many as possible will continue to live independently after a stroke and that the likelihood of achieving independence will not be determined by where that person comes from in the BNSSG area.

Demand for stroke care will increase and the specialist stroke workforce available to provide care is limited

Key Points:

- The local population is growing, getting older and living with more complex long term health conditions.
- There will be an increasing number of strokes in the local population and certain groups are more likely to have a stroke.
- The workforce available to provide specialist stroke care is limited.
- A new way of delivering specialist stroke care is needed that ensures that those most at risk have equitable access to specialist services.
- BNSSG needs to maximise the way in which the available specialist stroke workforce is deployed to achieve the highest outcomes possible for patients

4.2 There are variations in provision of care and access to specialised services

The provision of stroke services varies depending on the location and time of the week and where you come from.

The services delivered at each hospital in BNSSG vary and so does the performance of those individual services. The staff in local health care services work hard to deliver excellent care for patients, but the way that healthcare is organised in BNSSG makes it difficult to consistently provide high standards of care. In addition, new treatments and policy mean that treatment is becoming more complex, delivery of new interventions (such as thrombectomy) require a higher level of training and expertise; this can be harder to deliver over a large number of sites when there is a

limited specialist workforce. A depiction of the current service configuration is provided in Figure 2.

4.2.1 Service provision and operating hours

Southmead Hospital provides endovascular clot removal, called mechanical thrombectomy. This service is provided for the wider region, Monday to Friday between 8.00 and 18.00. Thrombectomy should be offered as soon as possible and within 6 hours of symptom onset, together with thrombolysis if applicable.³⁰ This service is provided at Southmead Hospital because the hospital has advanced imaging capability and is the local provider for interventional radiology including interventional neuroradiology. Hospitals providing thrombectomy need to perform a minimum of 150 procedures per year (with a minimum of 600 HASU admissions)³¹ in order to invest in and maintain specialist equipment and work force skill levels. This means it is only possible to have one thrombectomy centre for the BNSSG area.

Southmead Hospital, Weston Hospital and the Bristol Royal Infirmary (BRI) all provide acute stroke care, including thrombolysis, to eligible patients. Thrombolysis is a type of stroke treatment that uses intravenously delivered drugs to breakdown a blood clot in the brain. Currently, Weston Hospital does not accept new FAST positive strokes from the ambulance service with onset within thrombolysis time window after 5pm and likewise the BRI does not accept after 11pm, because these hospitals are not staffed for 24/7 specialist treatment. However all other stroke patients are taken to their local ED meaning that some require subsequent onward transfer to Southmead Hospital for thrombolysis. Treatment for stroke should be started as soon as possible and within 4.5 hours of the onset of stroke symptoms.³² Secondary transfer delays often mean this currently cannot be achieved for patients who are initially taken to a hospital outside of its thrombolysis operating hours.

Therapy services are provided inconsistently across the three hospitals and in the community. There is greatest provision at Southmead Hospital, with services offered over seven days on the stroke unit, including physiotherapy, occupational therapy and speech and language therapy. This is not consistently provided in Weston and BRI and the current review of services is an opportunity to change this situation.

4.2.2 Community Provision

As described in Chapter 3, Community provision for stroke in the BNSSG area has evolved over time under three different clinical commissioning groups, three different community providers and three different local authorities. There has been a reduction in commissioners and providers over the past 2-3 years, which is helping to bring consistency to the community service offer: the clinical commissioning groups merged in 2018 to create BNSSG CCG as a single commissioner of healthcare for the area, and the three community providers merged in 2020 following a large procurement process that established a single, integrated, service offer for community care.

³⁰ (2016 RCP Guidelines for Stroke and NICE Stroke Guidelines 2019)

³¹ Allen, Pearn, James et al. (2019), Maximising access to thrombectomy services for stroke in England: a modelling study. *European Stroke Journal*.

³² 2019 NICE Guidance

Sirona Care and Health were the successful bidders and since April 2020, when the new contract commenced, they have mobilised a full transformation programme for community health services, working closely with primary care, social care, the local voluntary sector and the local hospitals. Improvements in the service offer have already been made across BNSSG, with many areas of Sirona's transformation priorities accelerating in response to the Covid-19 pandemic response.

4.2.3 What does this mean for our services?

Stroke services vary depending on where people live and the time of the week that a stroke occurs. This is inequitable and means that people in BNSSG do not receive the same access to specialist care and treatment. Some of the worst served populations live in the most deprived communities in BNSSG, where risk factors for stroke are highest.

Steps have been, and continue to be, taken to improve the service offer and align provision, particularly in the community and between the BRI and Weston Hospital sites, following the recent mergers. However, the changes required to deliver compliance with the draft National Stroke Service Model cannot be achieved by adjusting and evolving the service offer; a major change to the configuration is required.

Further to the above, workforce deficits are a real challenge to current provision and impact daily on the delivery of care to stroke patients. BNSSG cannot maintain a service configuration into the future that stretches the available specialist staff across more sites than necessary and organises them in a way that cannot respond easily to service pressures. Operational deficits in service provision are currently exacerbated through a lack of central coordination and individual staff members cannot be readily supported by adjacent teams. If the current situation is not rectified there is significant risk that retention of specialist stroke professionals will be adversely impacted and that recruitment to the BNSSG area will become increasingly challenging, as other systems advance service improvements and become more attractive places to work.

There are variations in provision of care and access to specialised services

Key Points:

- Stroke services provision is inequitable across BNSSG
- There is a shortage of specialist stroke doctors and nurses
- The challenge of correcting the historical variations in services is significant and requires the local healthcare system to change the way that stroke services are organised.
- If BNSSG does not take action now there is a significant risk that the gap in workforce availability will get worse

4.3 Meeting National Clinical Standards

The NHS Long Term Plan gives a clear direction to improve stroke care

There is a strong and growing evidence base surrounding stroke care and factors that lead to better outcomes (fewer deaths and less disability, greater independence and function) for patients with stroke. Whilst BNSSG's hospitals benchmark in line with national average mortality indicators for stroke, stroke provision in BNSSG is not currently provided in line with all NICE and RCP guidelines, nor does it consistently meet the performance indicators known to contribute to improved outcomes for people that have experienced a stroke. Performance indicators for stroke are considered further below and the main guidelines this programme has considered can be seen in Table 1.

Table 1 - List of National Clinical Guidelines for Stroke

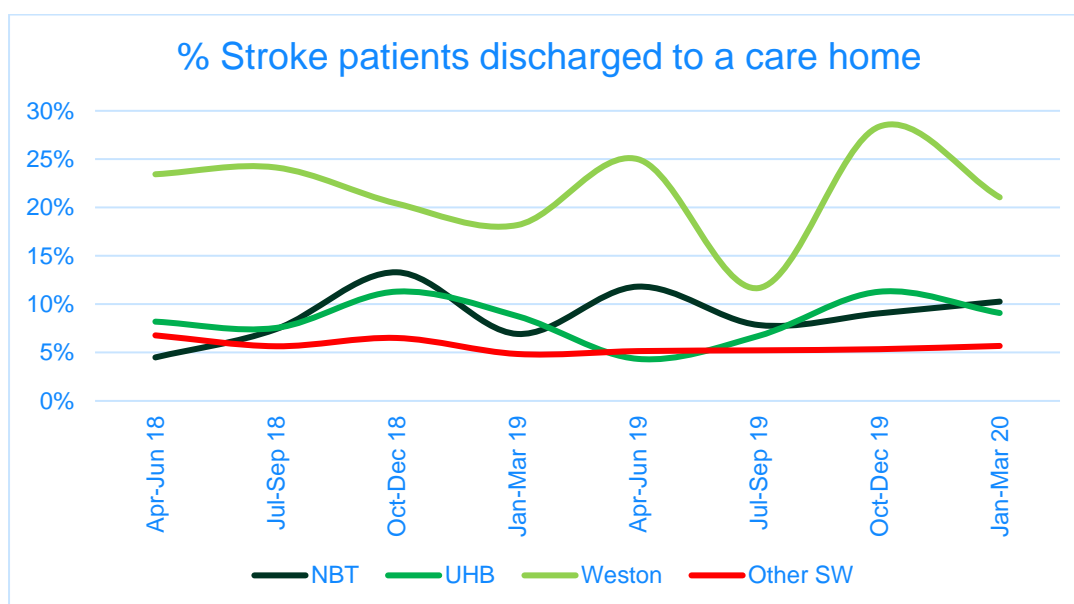
Current state
NICE Quality Standard 2
NICE NG128: "Stroke and transient ischaemic attack in over 16s: diagnosis and initial management"
NICE Clinical Guidance 162: "Stroke rehabilitation in adults"
NHS RightCare Stroke pathway
Royal College of Physicians (RCP) National Clinical Guidelines for stroke
British Association of Stroke Physicians: Stroke Standards

Morbidity and the level of disability that people experience after stroke is hard to measure objectively but it is likely that, as a result of service provision not being in line with all NICE and RCP guidelines for stroke care³³, BNSSG could do much better for the population that it serves. This is evidenced by the high numbers of people that are discharged to care homes following a stroke, in comparison to other South West Hospitals. In the period January-March 2020, Southmead Hospital, the BRI, and Weston Hospital discharged 12.5%, 10.9% and 20.7% respectively to care homes compared to 7.6% in Gloucestershire, 5.3% at the Royal United Hospital in Bath and 6.2% in Torbay and South Devon Trust.

There is therefore an opportunity within BNSSG to reduce the number of people that enter into care placements following a stroke. To achieve this, improved inpatient rehabilitation and robust services in the community are required to support people with greater disability and care needs to achieve timely hospital discharge and continue to meet their rehabilitation goals in their own homes.

³³ <https://www.nice.org.uk/guidance/ng128>

Figure 4 - Stroke patients discharged to a care home



Source: SSNAP data - please note that this data does not differentiate between whether or not patients were admitted from a care home (data not available for Apr-Jun 20 and Jul-Sep 20 for all trusts but for NBT and UHBW picture remains very similar).

The Sentinel Stroke National Audit Programme (SSNAP)³⁴ was set up to measure the quality and organisation of stroke care in hospitals across the NHS and provides a single source of data for considering the quality of the delivery of stroke care. SSNAP looks at a number of 'Key Indicators' to evaluate the performance of stroke services against the key national standards that are considered to demonstrate good quality care and patient outcomes. These are detailed in Table 2.

Table 2 - SSNAP Key Indicators

SSNAP Measurement
Overall SSNAP Performance
1) Scanning
2) Stroke unit
3) Thrombolysis
4) Specialist Assessments
5) Occupational therapy
6) Physiotherapy
7) Speech and Language therapy
8) MDT working
9) Standards by discharge
10) Discharge processes

Performance against each domain in the national clinical standards is graded A-E in the SSNAP audit and the change from the previous reporting period is indicated by

³⁴ <https://www.strokeaudit.org/Documents/National/AcuteOrg/2019/2019-AOANationalReport.aspx>

an arrow as reduced or improved. The results for the 10 domains of the audit are listed in the purple boxes and the column below each represents each Trust's performance. Figure 5 represents the latest results that are nationally available in this format and Figure 6 brings the overall hospital SSNAP achievement up to date, using the latest available data and comparing this across the most recent four reporting periods.

Figure 5 - SSNAP BNSSG Acute Hospital Performance Oct-Dec 2019

Trust	Number of patients		Overall Performance				Patient Centred Data										
	Admit	Disch	SSNAP Level	CA	AC	Combined KI Level	D1 Scan	D2 SU	D3 Throm	D4 Spec Asst	D5 OT	D6 PT	D7 SALT	D8 MDT	D9 Std Disch	D10 Disch Proc	PC KI Level
North Bristol NHS Trust	243	228	B	A	A	B	A	C	C↓	B↑	A	B	C↓	C↑	B	A	B
University Hospitals Bristol NHS Foundation Trust	124	130	C	A	B	C	A	E↓	D	C↑	A↑	C	C	C↑	B	B↓	C
Weston Area Health NHS Trust	67	76	D	A↑↑	A	D	B↑	E	B	B↑	C	D	D↑	D	B	C	D

Figure 6 - SSNAP BNSSG Acute Hospital Performance latest 4 reporting periods (2018-2020)

Time period	Hospital	Oct-Dec 2018	Jan-Mar 2019	Apr-Jun 2019	Jul-Sep 2019	Oct-Dec 2019	Jan-Mar 2020	Apr-Jun 2020	Jul-Sep 2020	Oct-Dec 2020
SSNAP Level	Southmead	C	B	C	B	B	B	A	A	B
	BRI	C	D	D	C	C	D	B	B	D
	Weston	D	D	D	D	D	D	Unavailable	Unavailable	D

These overall figures represent an improvement in time in Southmead Hospital and the BRI, which likely reflects the ongoing quality improvement work within each hospital and also the combined efforts of the reconfiguration programme to date. Data from Weston Hospital has not been available since April 2020 as, due to operational changes in patient flow as a response to the Covid-19 pandemic, less than 70% of the expected stroke cases were admitted which is the cut-off for SSNAP reporting. While local services continue to respond and develop independently, there remains the need for improvement in many elements of the stroke service across the 10 domains, and in providing improved equity across the BNSSG region.

Studies of stroke services over the past ten years have provided substantial evidence to support reconfiguration as a means of improving outcomes for patients.

For example, stroke services in Greater Manchester, London and Northumberland³⁵ (urban and rural populations respectively) that have reorganised stroke care into a smaller number of hyper-acute stroke units have been shown to improve the outcomes for patients who have had a stroke. Figure 7 demonstrates the impact of reorganisation of stroke services on SSNAP performance in Greater Manchester in March 2015.

Figure 7 - Impact of reorganisation of stroke services on SSNAP performance in Greater Manchester

Reconfiguration implemented March 2015

CCG	2014			2015				2016			2017		2018			2019			
	Apr-Jun 14	Jul-Sep 14	Oct-Dec 14	Jan-Mar 15	Apr-Jun 15	Jul-Sep 15	Oct-Dec 15	Jan-Mar 16	Apr-Jul 16	Aug-Nov 16	Dec 16-Mar 17	Apr-Jul 17	Aug-Nov 17	Dec 17-Mar 18	Apr-Jun 18	Jul-Sep 18	Oct-Dec 2018	Jan-Mar 19	Apr-Jun 19
Bolton	D	D	X	D	B	B	B	B	A	A	A	A	A	A	A	A	A	A	A
Bury	D	C	C	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Eastern Cheshire	D	D	D	D	C	C	B	B	B	A	A	A	A	A	A	A	A	A	A
Heywood, Middleton & Rochdale	C	C	C	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Manchester (North)	D	C	C	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Manchester (Central)	D	D	D	C	B	B	B	B	A	A	A	A	A	A	A	A	A	A	A
Manchester (South)	D	D	D	D	C	B	B	B	B	A	A	A	A	A	A	A	A	A	A
Oldham	C	C	C	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Salford	C	B	C	B	B	A	A	B	A	A	A	A	A	A	A	A	A	A	A
Stockport	D	C	C	D	C	B	B	A	B	A	A	A	A	A	A	A	A	A	A
Tameside & Glossop	D	C	D	D	C	C	B	B	B	A	A	A	A	A	A	A	A	A	A
Trafford	D	D	C	D	B	B	B	B	A	A	A	A	A	A	A	A	A	A	A
Wigan Borough	D	D	C	C	B	B	B	B	A	A	A	A	A	B	A	A	A	A	A

NB: The SSNAP ratings are not outcomes as ends in themselves, but processes that should lead to good outcomes.

This growing body of evidence can be translated into clear guidance for STP’s on the recommended standards for Acute Stroke Services, supported by data from the SSNAP:

- HASU’s are more likely to be clinically effective if they are admitting between 600 – 1500 cases per year.
- Larger services are more likely to be financially viable than smaller services. Financial modelling suggests that the breakeven point if all patients were eligible for the best practice tariff is about 900 admissions per year.
- There are major problems recruiting to consultant stroke physician posts across the UK. The only way that services are going to be able to deliver the specialist senior medical cover set out in specifications will be to centralise care into larger units.
- There is a tight correlation between high nurse levels and decreased mortality. There should be a minimum of 3 nurses per 10 beds at all times on hyper acute stroke units.
- Ambulance service transfer to the appropriate stroke centre within 60 minutes, ideally within 30 minutes from scene to hospital.

4.3.1 Immediate care

³⁵ Impact and sustainability of centralising acute stroke services in English metropolitan areas: retrospective analysis of hospital episode statistics and stroke national audit data BMJ 2019;364:l1

Immediate care incorporates early ‘life-saving’ treatments for stroke, including how people with suspected stroke are transported to the acute stroke units rapidly and safely and the immediate treatment that they receive once they arrive. Thrombolysis (clot-busting medication given very early following a stroke) and Thrombectomy (removal of clots from arteries in the brain) are two key parts of immediate care, for which there are important national guidelines. In many of these areas the key national standards are not being met or are only partially met, Table 3 provides a summary of the standards associated with immediate care that require improvement in BNSSG.

Table 3 - Summary of key immediate care standards that are unmet/require improvement in BNSSG.

Current state	Relevant National Clinical Standard
There is no HASU care available to patients across BNSSG	RCP organisational guidance 2.2.1B: Patients with acute neurological presentation suspected to be a stroke should be admitted directly to a HASU.
Acute stroke services are spread across three non-centralised hospitals.	NHS Long Term Plan: The evidence is clear that centralised stroke units are more likely to reduce mortality and provide effective stroke treatment.
Not all patients who need it are offered thrombolysis within 4.5 hours	NICE ng128: Alteplase (for thrombolysis) treatment [where appropriate] should be started as soon as possible within 4.5 hours of onset of symptoms Also RCP 3.5.1A and 3.5.1G: Recommendations for management of ischaemic stroke.
Number of eligible patients given thrombolysis within 1 hour is variable	NICE ng128 and RCP 3.5.1: Treatment should be started as soon as possible. SSNAP Key domain indicator 3.3: Thrombolysis within 1 hour of arrival at hospital.
Not all patients who need it are offered thrombectomy within 6 hours.	NICE ng128 1.4.5: To be offered thrombectomy within 6 hours.
Not all patients are scanned within 1 hour of arrival at hospital	RCP 3.4.1: Patients with suspected stroke to receive brain imaging within 1 hour of arrival

4.3.2 Hospital care

Hyper Acute interventions such as brain scanning and thrombolysis are best delivered as part of a networked 24/7 service. Areas that have centralised Hyper Acute stroke care into a smaller number of well-equipped and staffed hospital units have seen the greatest improvements.³⁶ There is a national expectation that 90% of stroke patients receive care on a specialist stroke unit and that of all patients who could benefit from thrombolysis (about 20 percent) receive it, as opposed to just half of all eligible patients receiving it now. Expanding mechanical thrombectomy from 1% to 10% of stroke patients – would (using data from existing services) allow a

³⁶ NHS Long Term Plan

further 23 people to be independent after their stroke each year, potentially allowing them to return to work, improving quality of life and reducing the care burden.

Acute care following a stroke is best delivered by specialist teams trained specifically in stroke care and on dedicated stroke units, which only look after patients who have experienced a stroke. Being admitted immediately to a specialist stroke unit, having key assessments, such as swallow screening, carried out by different members of the multi-disciplinary team within certain timeframes, and spending more than 90% of time in hospital on a dedicated stroke unit are all things that have been associated with higher quality care and improved outcomes.

The SSNAP audit captures key data relating to patient care in the first 72 hours following a stroke (and across the whole admission), including indicators described above associated with Hyper Acute and Immediate care. Services across BNSSG are not meeting all of the recommendations in this area and the key clinical standards that are unmet or require improvement in hospital care can be seen in Table 4.

Table 4 - Summary of hospital stroke care national clinical standards that are unmet/require improvement in BNSSG

Current state	National Standard not met
The length of time taken to be assessed by a stroke specialist consultant varies across the region.	RCP 2.3.1B: Patients with suspected stroke should be assessed for emergency stroke treatments by a specialist physician without delay. SSNAP Key domain indicator 4.1: Assessment by stroke specialist consultant physician within 24 hours
Patients with stroke are sometimes delayed in accessing a bed on a stroke unit or are managed on other wards	RCP 2.2.1C: Patients with suspected stroke should be admitted directly to HASU
Across BNSSG only 70-80% of patients are spending 90% or more of their time on a stroke unit	SSNAP Key domain indicator 2.3: Proportion of patients who spend at least 90% of their stay in a stroke unit.
Across BNSSG only 70-80% of patients are having their swallow screened within 4 hours	RCP 3.10.1E Patients with acute stroke should have their swallowing screened within 4 hours and before being given any oral food, fluid or medication. SSNAP Key domain indicator 4.5: Applicable patients to have a swallow screen within 4 hours of arrival at hospital.

4.3.3 Community Care and Life After Stroke support

As described in Section 4.2, there is currently inequitable provision of stroke rehabilitation across BNSSG meaning that some patients don't have access to the rehabilitation that they need following their stroke.

A lack of community rehabilitation beds in specialist units and the specialist staffing to deliver the rehabilitation impacts on length of stay in hospitals, as does a lack of

access to social workers and planning care for discharge when support is needed. There is also inconsistency regarding the speed of access to initial therapy assessment, plus the frequency and amount of therapy support offered, against national standards of therapy provision, and under-use of voluntary sector support. If better integrated with health and social services, voluntary sector support could lighten the burden on NHS services, at the same time as providing a highly specialised and beneficial service to people with stroke. For example, in emotional and psychosocial support, which patients and carers often cannot access through traditional NHS healthcare provision.

One of the key aspects of national clinical guidance that relates to life after stroke is the need for support once discharged from inpatient settings and from formal community teams. Currently, it is difficult for patients to have clear social care plans organised whilst in hospital and waiting for care support to be arranged often causes a delay to leaving hospital. Across the region there is also inequity in how and when the nationally recommended 6-month reviews occur for people who have had a stroke. Table 5 summarises how current community and life after stroke care deliver does not meet national clinical standards in a number key areas.

Table 5 - Summary of community stroke care national clinical standards that are unmet/require improvement in BNSSG

Current state	National Standard
Inequitable provision of stroke rehabilitation beds across BNSSG; Lack of specialist community stroke beds impacts on length of stay in the acute hospitals	RCP 6.4.1A: Commissioning recommendations – services should be capable of meeting the specific health, social and vocational needs of people with stroke of all ages.
Inconsistent, and in many places no 7-day provision of care and rehabilitation. Some areas do not have an adequate stroke specialist stroke service on discharge, for example across much of North Somerset.	RCP 2.7.1K: People with stroke should continue to have access to specialist services after leaving hospital.
Patients with stroke across BNSSG do not get the intensity or duration of therapy that is required to meet their goals. In some areas only 60% get the Physiotherapy they need, while in others only 50% get the OT and only 40% get the Speech and Language therapy that they need.	RCP 2.11: People with stroke should accumulate at least 45 minutes of each appropriate therapy every day for as long as they are willing and capable of participating and showing measureable benefit from treatment.
No community stroke rehabilitation beds, or dedicated community stroke ESD service in the southern part of North Somerset.	RCP 2.7.1K: People with stroke should continue to have access to specialist services after leaving hospital.
Across BNSSG there is significantly inequitable and insufficient access to psychological support, and in some areas, no access to it at all.	NICE cg162: Core stroke rehabilitation teams should contain clinical psychologists. RCP 2.12.1A: Stroke services should have a comprehensive approach to delivering psychological care that includes specialist clinical neuropsychology input. NICE 1.5: Emotional functioning should be appropriately assessed, recognising that

	psychological needs may change over time.
Service users report feeling abandoned once discharged from hospital and access to social workers to plan long term care is sometimes delayed.	NICE CG162 1.1.6: To be offered a social care assessment before leaving hospital. RCP 5.9.1.1B/D: People with stroke should be offered further therapy (if goals can be identified and potential for change is likely) and should be supported to develop their own self-management plan.
Formal 6 month reviews of people with stroke are not occurring in several parts of BNSSG.	NICE Quality Standard 2 (Stroke) – Quality Statement 7: People with stroke should have a structured social care review at 6 months and 1 year after the stroke. RCP Key recommendation: 5.9.1.1A: Structured reviews should occur at 6 months, 1 year and annually after stroke.
Voluntary sector support is currently not equitable across BNSSG and not accessed by all patients who could benefit.	RCP 2.7.1G: Before transfer of care and rehabilitation to home, [along with other planning] a patient with stroke should be offered contact with relevant voluntary agencies.

4.3.4 What does this mean for our services?

Stroke services in BNSSG need to be reorganised so that the national commitments in the NHS Long Term Plan can be achieved for the local population. Reconfiguration of immediate and hospital care will reduce the number of people that are severely disabled following a stroke, decrease mortality and, coupled with improvements in community provision for stroke, keep more people in their own homes.³⁷ Evidence outlined in the NHS Long Term plan makes clear that:

*“...hyper acute interventions such as brain scanning and thrombolysis are best delivered as part of a networked 24/7 service. Areas that have centralised hyper-acute stroke care into a smaller number of well-equipped and staffed hospitals have seen the greatest improvements. This means a reduction in the number of stroke-receiving units, and an increase in the number of patients receiving high-quality specialist care”.*³⁸

A review of stroke services across the whole of the South West by expert stroke physicians found that the quality of care for stroke patients in the South West would improve if all patients attended larger centres.³⁹ Hospitals in BNSSG, as with hospitals across the country, are managing an increasing number of patients with more complex illnesses and this presents significant challenges in particular to emergency departments.

³⁷ Organised inpatient (stroke unit) care for stroke. Cochrane Database Syst Rev. 2013 Sep 11;(9):CD000197. doi: 10.1002/14651858.CD000197.pub3.

³⁸ NHS Long Term Plan

³⁹ Bigger Better Faster

The evidence that highly specialist care delivered immediately after a stroke has occurred improves short and long term outcomes for patients is strong. Delivery of highly specialised care needs a smaller number of centres that concentrates the expert workforce. This centralised model results in a more resilient skilled workforce and reduces handovers in care.

The existing services delivered in BNSSG are complicated, do not consistently meet the national standards and do not deliver equitably. There are opportunities to reorganise stroke services through a clinically led design and evaluation process and this has ensured that the best clinical models for the region are being put forward for consultation.

National Clinical Standards

Key Points:

- Centralising acute stroke care will improve clinical outcomes for patients.
- Creating a single specialist stroke workforce will increase the quality of care that is given and enhance flow throughout the stroke care pathway.
- Making improvements to the way that community services work will offer a greater intensity of more specialised rehabilitation and will enhance the support given to people recovering from stroke when they return home.
- Reconfiguring services is an opportunity to commission more equitable services which are in line with national best practice.

4.4 Value for money

NHS and local authority commissioners have a responsibility to ensure that every pound spent on behalf of tax payers offers as much health benefit to the population as possible.

The average societal cost of stroke per person is £45,409 in the first 12 months after stroke (cost of incident stroke), plus £24,778 in subsequent years (cost of prevalent stroke). Stroke Association research has projected that the overall costs of stroke in the UK for those aged 45 years and over will rise from £26 billion in 2015 to £43 billion in 2025 and £75 billion in 2035, an increase of 194% over 20 years.⁴⁰

In the baseline year of 2018/19, SSNAP records that 1,561 strokes were treated in BNSSG hospitals. The baseline exercise undertaken by the BNSSG Stroke Programme has calculated that the cost of delivering the stroke service in secondary and community care in 2018/19 was £29.7m. This works out at an average cost per stroke of £18.6k per annum. Further health service costs (for example ambulance, primary care and continuing health care) would also have been incurred.

In addition, there are significant social care costs associated with meeting the long term care needs of those that experience a stroke. Table 6 gives an overview of the

⁴⁰ Costs of Stroke in the UK

cost of care provision association with 90 days of provision of care at different levels of disability. The 90 day unit would be repeated for however long an individual received care in this category.

Table 6 - Cost per 90 days of care associated with different levels disability need

Disability score	Cost per 90 days (2014)	Cost per 90 days (inflated to 2020)	Source
90-day costs Barthel score* of 20–10	£459	£517	Franklin <i>et al.</i> (2014) ⁴¹ https://www.ncbi.nlm.nih.gov/books/NBK537635/table/table11/?report=objectonly
90-day costs Barthel score of 0–9	£1926	£2171	Franklin <i>et al.</i> (2014) ⁴²
90-day costs residential care or nursing home	£10,647	£11,999	Gordon <i>et al.</i> (2014) ⁴²

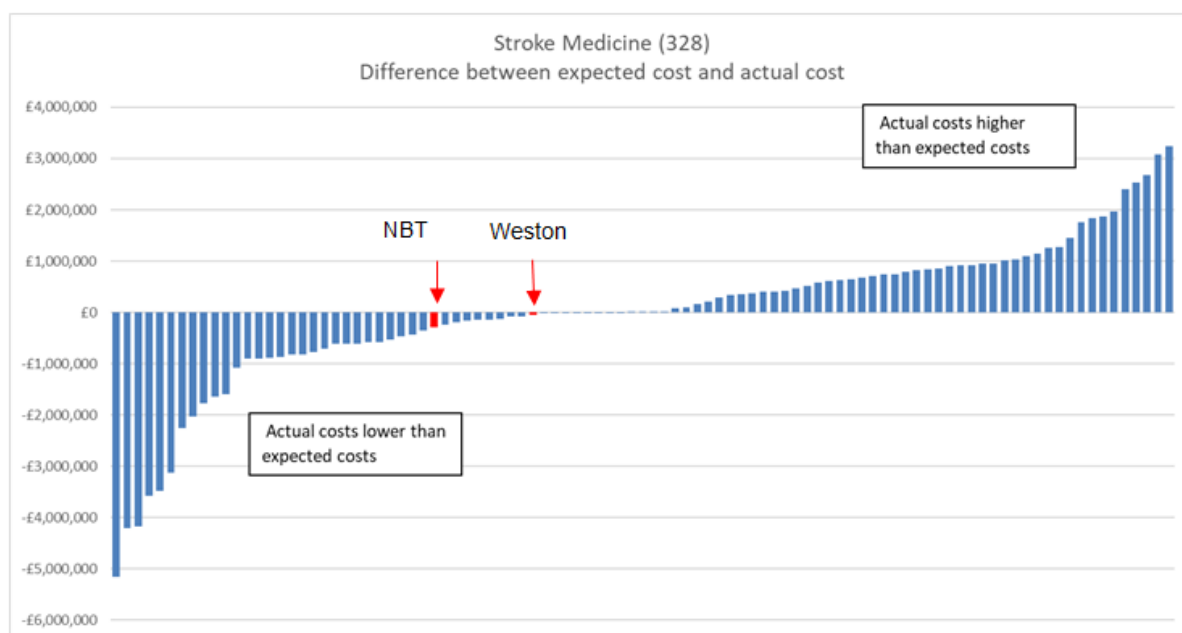
*Barthel is a disability indicator – a low Barthel score is associated with high disability.

Figure 8 demonstrates that BNSSG hospital spend on stroke services is broadly in line with that expected. This national benchmarking information that demonstrates NBT and Weston Hospital (red bars on the graph) have a slightly lower than average spend on stroke care than would be expected in comparison to other hospitals (note that University Hospitals Bristol (pre-merger with Weston) did not submit activity against the stroke speciality code and therefore their data is not available). Despite this broadly average spend on stroke care, SSNAP indicators indicate that achievement against key outcomes is low for stroke patients in the BNSSG area. Figure 9 provides a comparison of average SSNAP achievement in 2018/19: it can be seen that most CCGs had an average SSNAP level of an A or a B, indicating good outcomes, but BNSSG achieved a C in three of the four audit periods and a D between October and December 2018. This suggests that the NHS spend on stroke in BNSSG is not achieving value for money, in comparison to other healthcare systems.

⁴¹ [TABLE 11, \[Cost inputs for the 90-day and 10-year model\]. - Evaluation of reconfigurations of acute stroke services in different regions of England and lessons for implementation: a mixed-methods study - NCBI Bookshelf \(nih.gov\)](#)

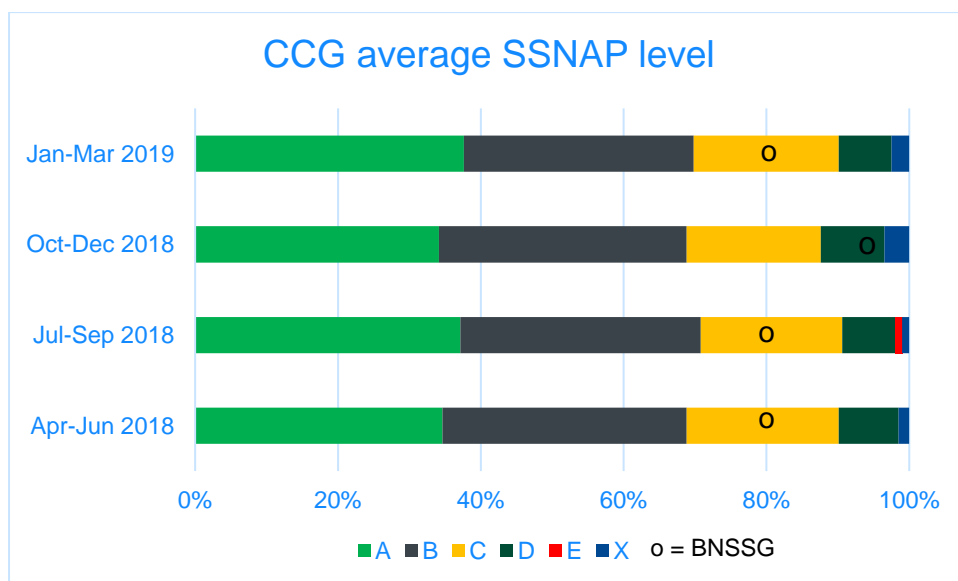
⁴² Gordon AL, Franklin M, Bradshaw L, Logan P, Elliott R, Gladman JR. Health status of UK care home residents: a cohort study. *Age Ageing*. 2014;43:97–103. doi: 10.1093/ageing/aft077.

Figure 8 - Difference between expected cost and actual cost



Source: National Cost Collection Index 2018-19 (note UHBW do not submit separate data for stroke medicine)

Figure 9 - CCG average SSNAP level



Source: SSNAP Apr2018 - Mar2019 Annual CCG Results Portfolio

Section 4.2 describes the variation in current service provision across BNSSG and this is also reflected in variable costs. The costs per acute hospital spell range from between £4.5K and £10.7K and the cost of community contacts range between £57 and £90 per contact, see Table 7.

Table 7 - Current variation in the cost of stroke activity units in BNSSG

Activity	Cost
Acute Cost per spell	Between £4.5k and £10.7k

Rehab Cost per day	Between £200 and £450
Pathway 1 cost per contact	Between £57 and £90
Pathway 2 cost per bed day	Between £310 and £361

When this is considered by local authority area, the range is less notable but variation in spend can be seen, with both South Gloucester and North Somerset benchmarking higher than the national average (see Table 8).

Table 8 - SSNAP Annual Costs of Stroke - BNSSG

	Bristol	North Somerset	South Glos	BNSSG average	National average
NHS cost per stroke	£12,500	£13,400	£13,500	£13,133	£12,800
Social care cost per stroke	£7,500	£8,700	£9,100	£8,433	£7,900
Total cost					£1.7 billion

SSNAP cost estimates are in line with the baseline cost of £14.4k.

4.4.1 What does this mean for our services?

NHS funds are not currently spent in a way that maximises value for money. There is a poor correlation between the money spent on stroke and the outcomes achieved. BNSSG needs to move to a service model that brings greater value to patients from the money spent on it. A more consistent spend, resulting from a more consistent service offer, should be achieved across the BNSSG geography.

Achieving better value also means refocusing service provision on the aspects of care that are known to provide the best outcomes, such as improved access to highly specialist immediate stroke treatments and HASU care. This will ensure that the money spent on stroke care in BNSSG directly contributes to maximising the number of people that achieve independence following a stroke and, in turn, ensure that the cost of providing long term care as a result of a stroke is minimised.

Value for money

Key Points:

- There is currently a poor correlation between the money spent on stroke and the outcomes achieved.
- BNSSG can bring greater value to patients by spending NHS money on stroke services differently.
- There is opportunity to reduce the long term care costs associated with disability by reconfiguring services and giving more people in BNSSG rapid and equitable access to those interventions that provide the best outcomes

5 Engagement & Co-production

5.1 Overview of engagement

It is vital that any review of stroke services incorporates the needs and views of those with lived experience of these services, as well as those working within them.

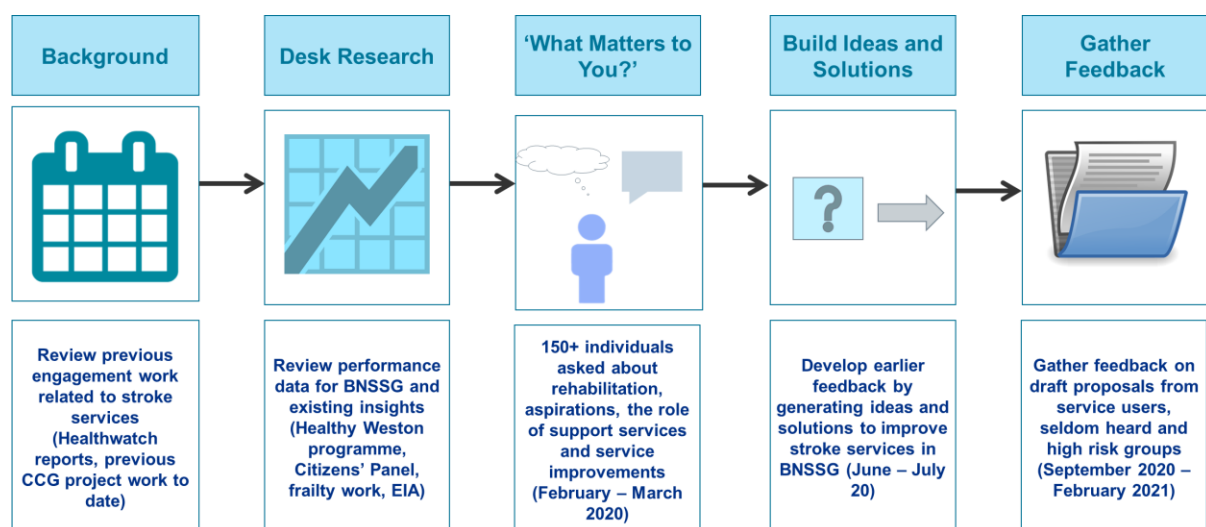
As part of the development of the consultation proposals the BNSSG Stroke Programme has undertaken initial public and stakeholder engagement in order to understand what is most important to those recovering from stroke. The process that has been used to date can be seen in Figure 10. Stakeholders including clinicians; patient, carer and public representatives and those from the third sector have been involved in a wide range of engagement activities so far.

To date, this public engagement has taken place over four distinct phases:

- February / March 2020 – Exploratory phase of public engagement
- June / July 2020 – Building and testing ideas
- September / October 2020 - Feedback on draft proposals for consultation
- January / February 2021 – Targeted engagement with seldom heard and higher risk groups for feedback on draft proposals

The findings from the four phases of activity are described in section 5.5 below and the intention is to continue this iterative engagement throughout the coming months. Any larger public engagement work conducted by Healthier Together will also be influenced by the patient and public involvement groups specifically linked to stroke and to wider groups, such as the BNSSG CCG Patient and Public Involvement Forum. The information gained through the consultation will continue to build on the initial sample to ensure fair representation which reflects the population in Bristol, North Somerset and South Gloucestershire who are most at risk of stroke.

Figure 10 - Stakeholder Engagement Process



5.2 Patient and Public Involvement

Between 4th February and 11th March 2020, an initial phase of engagement was conducted involving clinicians, members of the public, carers and those from the voluntary sector. The primary purpose of this phase of engagement was to explore what matters most to those with lived experience, carers and staff in relation to stroke recovery and rehabilitation.

In order to explore this, the programme has conducted its own engagement sessions and has attended numerous support groups across Bristol, North Somerset and South Gloucestershire.

During each session, attendees were asked to consider four questions:

- When thinking about stroke services, what matters to you?
- What are the future aspirations of those with lived experience and those working within stroke services?
- How did stroke services help meet your aspirations and what matters to you?
- How could stroke services improve to meet some of these needs?

The second phase of public engagement, which was delayed due to the COVID-19 pandemic, took place in June and July 2020. The purpose of this work was to build upon the initial findings from February and March in more detail, while developing ideas and solutions which could help improve stroke services locally. This public engagement work was conducted remotely, and is summarised below:

‘Zoom’ Co-Design Group: In July 2020, a small group of individuals were involved in the co-design of solutions in response to previous feedback around stroke services. This group met remotely, and participants provided detailed feedback and ideas on a range of topic areas related to immediate stroke care and rehabilitation.

COVID-19 telephone interviews: Temporary changes to service provision took place as a result of COVID-19, and until July 2020 this presented a large gap in our understanding in relation to stroke support people had received in recent months. The primary aim of this work was to understand how remote rehabilitation support met or exceeded the expectations of people accessing it.

Online quantitative survey: Following the telephone interviews and co-design group, there was a need for quantitative feedback in order to ensure ideas and solutions proposed during the first stage were reliable across a larger number of people. This resulted in a short, focused survey to explore ideas and feedback received in February and March.

The third phase of engagement took place throughout September and October 2020, and focused on gathering written feedback on the draft proposals for consultation with 18 service users with lived experience of or impacted by stroke from across the BNSSG region.

During January and February 2021 a fourth phase of targeted engagement was established to ensure those from high risk groups and seldom heard communities

were given the opportunity to feedback and be involved in the shaping of the stroke consultation proposals. This involved a series of interviews exploring participant's views on the number and location of the proposed hyper acute, acute and sub-acute stroke units. The role and delivery of stroke prevention services was also reflected on during these discussions.

The list of engagement opportunities conducted in this initial phase along with the summary report is listed in Appendix 5.

5.3 Higher risk and seldom heard groups

Initial analysis uncovered a higher incidence rate of stroke in areas of North Somerset, and so far the outreach engagement work has reflected this, by actively seeking engagement from individuals in this area. Geographic monitoring data was collected during Phase 1 engagement and the Phase 2 online surveys to observe whether feedback was from a geographically equitable sample and to highlight where further targeted sampling may be required in future engagement. Additionally during the phase 4 interviews, community and voluntary partnership organisations from across all 3 localities were actively approached to share and promote the opportunity to take part in any engagement activity. It is recognised that as the consultation process continues the BNSSG Stroke Programme must make certain that those living across Bristol, North Somerset and South Gloucestershire are proportionately involved within the engagement process through thorough planning, monitoring and learning through each phase of engagement. Geographic and demographic monitoring has and will continue to be used to ensure representation of the various groups and localities is fair and proportional, and to identify possible themes that need further investigation.

As detailed in Chapter 4, people from black or minority ethnic groups are almost twice as likely to experience a stroke as white people and, as well as people with South Asian background, tend to have a stroke ten years earlier than white people. These people, as well as the generally ageing population, those with modifiable existing health risk factors and those from disadvantaged and deprived areas, represent a wider group at higher risk of having a stroke and of being more likely to be impacted by changes to services. It is vital that the voice of people from within these groups is heard, to contribute to development of proposals of services that they may need.

Work to target these groups for engagement activity has already been conducted in partnership with public health bodies and this process will continue throughout the reconfiguration process, specifically within the consultation period. The Equality Impact Assessment (Appendix 6) highlights those groups that are more likely to be impacted by changes made to stroke care services and the public consultation plan (Appendix 7) describes in more detail the approach to targeting these groups.

Two examples of how successful engagement with some of these groups is being planned and conducted are: 1) Collaborative links with research being planned and conducted by researchers at the University of the West of England (UWE) into the information and support needs of BME groups following a stroke, and 2) Discussions

with colleagues working in Public Health teams as to existing networks and how best to initiate engagement with people with learning disabilities.

BNSSG CCG has identified seldom heard groups within the BNSSG population by looking at local data, and by applying ongoing monitoring of demographic and geographic information during public engagement activities. This has facilitated identification of under and over represented groups in relation to the population of the area, and assisted in the formation of the strategy to allow accessible participation in the stroke reconfiguration programme engagement process for these groups.

During phase 4 of public engagement, a targeted outreach approach took place to ensure involvement from those in higher risk and seldom heard groups. The opportunity to participate in this phase of engagement was distributed and shared with established voluntary and community networks and partnerships across Bristol, North Somerset and South Gloucestershire, including The Bristol and Avon Chinese Women's group, The Care Forum and African Voices Forum. Active BAME community leaders were also engaged for feedback and to share key messaging as well as the opportunity to take part within their communities. Translations and interpreter services were offered and supplied to allow this opportunity to be fully accessible for those where English may not a first language. Suitable individuals were also identified and invited to take part through the [Healthier Together Citizens' Panel where](#) it was possible to consider those with specific conditions such as diabetes or high blood pressure, or from specific communities or groups, such as those from BAME community groups. This approach will continue to be adopted throughout the engagement process to ensure those from seldom heard communities and high risk groups have the opportunity to be involved in the shaping of stroke services across BNSSG.

Due to COVID-19 restrictions, participants of Phase 4 engagement could either take part via telephone call, online video call through platforms like 'Zoom' or could give written feedback (either digitally or physically) to the interview questions. Offering a range of approaches to participants meant that those who may be less digitally able or those with communication difficulties were still able to be involved. It also addressed issues such as digital exclusion for those from more deprived socioeconomic backgrounds. As described in chapter 6.3, people from more deprived areas have an increased risk of stroke. As a higher risk group it is vital that any engagement opportunities are made accessible, and that considerations around access are continued to be applied throughout the stroke reconfiguration programme process. Pre-existing local data showing the social and economic status of an area or group can also be used to inform decision making on the approach for future engagement activity to make sure the engagement methods applied are inclusive.

Following stroke, many people have communication or cognitive difficulties which make communication more difficult (such as aphasia) and as such this group are potentially at risk of being less included in engagement. Specific engagement approaches have been undertaken to ensure that engagement with these people is successful in identifying issues, concerns and comments. An advanced Speech and Language Therapist is a member of the programme team and has led on communication approaches with this group of people and maintains a regular co-

design meeting with several members. Written communication for engagement has and will continue to be screened by her for accessibility to people with communication difficulties and, if necessary, more accessible versions of the documents produced.

During the second phase of engagement, a range of remote approaches were used in response to COVID-19, particularly given that those at risk from stroke are possibly more susceptible to COVID-19. These methods include online public engagement activity through platforms such as 'Zoom', as well as telephone interviews with those who are less digitally enabled. The public consultation plan will include, where possible regarding COVID-19 restrictions, socially distanced face-to-face communication to ensure that the voices of those with less access to or ability to use technology are not missed.

5.4 Engagement with staff

Throughout the development of these proposals, staff working within stroke services and those in the voluntary sector have been heavily involved in the development of the proposals for change. They have also played key roles in facilitating engagement with people who have lived experience of stroke, while the programme has also considered their views in terms of what matters to them.

The Clinical Evaluation Process involved clinicians working in stroke services from all organisations in BNSSG and across all professions. Representation in this process was excellent and, working with people with lived-experience and programme management, clinicians from within the various services were able to co-design the clinical service model. In addition to this, a specific engagement session for stroke clinicians was held on Tuesday 4th February 2020 to ensure that wider staff views were heard early in the development of the proposals.

As the proposals were worked up in more detail it became apparent that a detailed clinical desktop review session was needed for clinicians within UHBW in order to ensure all risks and issues that could impact the BRI and Weston Hospitals as a result of the proposed service changes were identified. This was held on 5th August 2020 and attendance from the Programme Team enabled a greater depth of understanding to be gained about the concerns held, particularly within the BRI. All the risks that were identified during this session, and the mitigations identified with UHBW, are included in the Stroke Programme Risk Register. All mitigations have been assessed to be adequate by the UHBW Stroke Project Board and the BNSSG Stroke Programme Board. A comprehensive Issue Log is also held by the programme; this has been carefully worked through in the development of this Pre-Consultation Business Case and will continue to be a central feature of the programme management ahead of the development of the Decision Making Business Case later in 2021.

Staff engagement has been a core component of the above throughout all the programme development. The clinicians leading the development described above are current staff members within stroke in BNSSG and in turn lead teams within their relevant organisations.

Examples of specific staff engagement has included Early Supported Discharge Teams workshops in 2019, staff informal briefings locally delivered by managers and clinicians from the Stroke Programme Board throughout the programme lifecycle, as well as formal briefing documentation developed and agreed by the programme team to ensure key messages are covered and issued consistently to all staff.

In addition to this, information sharing sessions were held in December 2020. Prior discussions with clinical teams guided the days and times of these sessions to capture most staff. The sessions were held via a digital platform and made available to everyone working within stroke care in BNSSG. The sessions took the form of a summary of the progress to date of the programme and key decisions made and then opened up for questions. Despite intense system pressure due to COVID response, around 35 people attended and a written briefing was also provided for distribution within organisations and for discussion at team meetings, to be used for those staff unable to attend the event in person. Follow-up questions and active engagement from all staff was encouraged.

As the programme progresses through the key milestones during 2021 further proactive engagement sessions are planned. These include sessions following the Clinical Senate review process and submission of PCBC in February 2021, Pre-HOSC updates and further engagement sessions during the public consultation. A wide and inclusive approach to engagement is being applied taking account of local networks and voluntary sector organisations including, amongst others, Bristol After Stroke, the Stroke Association and Bristol Black Carers who have all been involved in supporting and developing a number of aspects of the programme.

Now the options for clinical models are defined, a developing feature of this engagement activity will also be a more targeted focus around the impacts of the options for staff to ensure that staff have a clearer understanding of 'what it means to me'. Key concepts including the 'One Stroke Workforce' will be discussed with staff to help both refine these proposals as well as provide a clear idea of how the future models of working and organisational design will look. Staff networks and groups will be approached to identify and address any specific implications or concerns. While it should be noted that this will not be a formal staff consultation at this stage, as the programme is still seeking to consult with the public on two main options in relation to the acute pathway considerations, staff engagement and views are recognised as a crucial part of the public consultation and steps will be taken to ensure there is the opportunity to discuss and capture them.

Any formal staff consultation would not be undertaken until after a public consultation and decision making business case has been completed and approved. Staff consultation will be undertaken on the basis of organisational change principles and in line with relevant legislation including where appropriate Transfer of Undertakings Protection of Employment (TUPE) regulations.

Further details around the Stroke Programme staff engagement approach can be found in Appendix 5

5.5 Findings and Implications

5.5.1 Phase One – ‘What Matters to You?’ – February and March 2020

During the first phase of engagement, between February and March 2020, the CCG received 443 pieces of feedback representing 153 individual attendees who were recovering from a stroke, members of the public, clinicians, carers or those from the third sector.

Of the 443 pieces of feedback that were received during this phase of initial public engagement, **179 (40%)** of them related to having clear support after leaving hospital. Specifically, many respondents felt they did not receive sufficient levels of support once their stay in hospital was complete, while others believed that the link between the care they received in hospital and out-of-hospital could have been improved.

24% of feedback related to functioning in everyday life and the individual being able to live as actively as they could following their stroke. It was felt that services should enable individuals to function, and a key component of this involved understanding individual patient need.

21% of these comments related to individuals – both those in recovery and those who are carers or family members – being provided with clear, timely and sufficient information following a stroke.

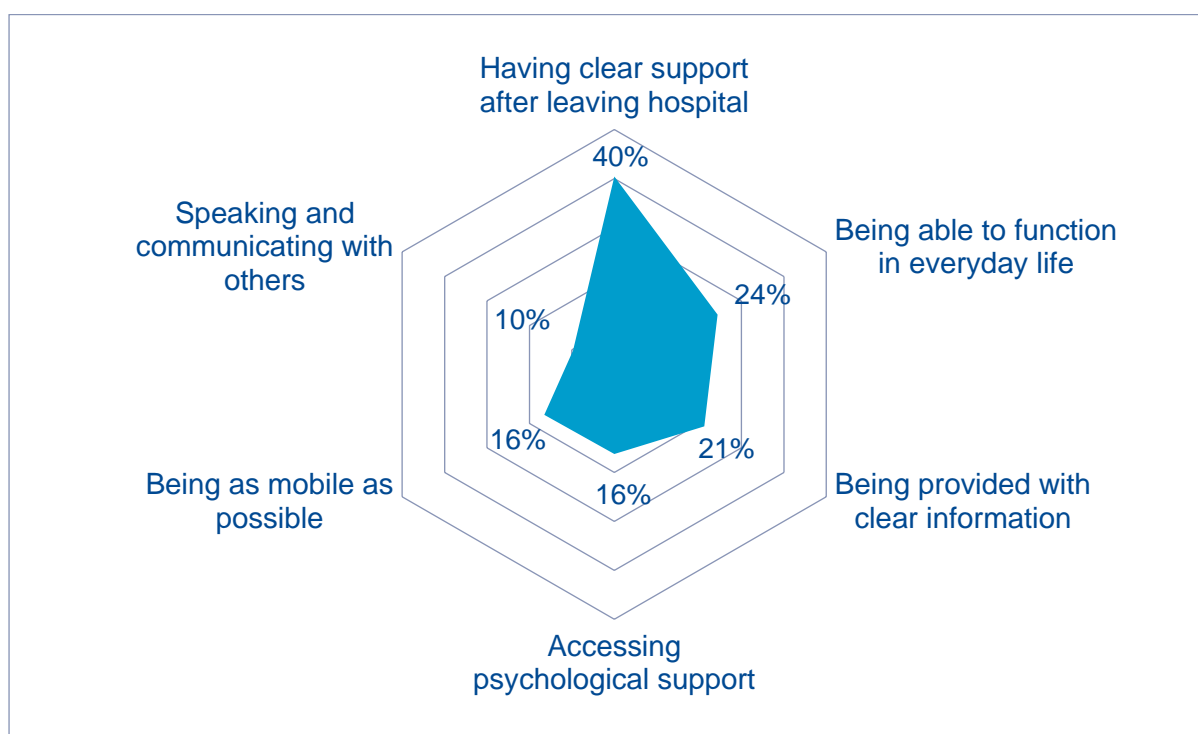
Another key theme was improving mobility following a stroke. **16%** of feedback was attributed to this. Some respondents' main concerns were related to physical mobility and accessing support through physiotherapy, while others commented on accessibility and transport.

16% of feedback related to accessing psychological support. Those who discussed this as part of their feedback referenced the importance of mental wellbeing in relation to isolation, confidence and independence.

10% of comments focussed on communicating with others, and the importance of speech and language.

Figure 11 provides an overview of the feedback themes. In addition, a regular discussion point for respondents at this stage was the inequity of stroke support across Bristol, North Somerset and South Gloucestershire. Further details around this feedback can be found in Appendix 5.

Figure 11 - Feedback themes from engagement work to date



The results of Phase 1 engagement gave initial findings and ideas to take forward for exploration in the follow engagement phases. It also allowed us to better understand the steps to take to broaden our continued engagement, and was used to shape the approach and design of future engagement activities.

5.5.2 Phase Two – Building Ideas and Solutions – June and July 2020

Feedback collected during this phase of public engagement has sought to generate ideas and solutions to improve stroke services in Bristol, North Somerset and South Gloucestershire, in addition to building upon initial public engagement earlier in the year. This second phase of public engagement was split into 3 parts:

1) Interviews to establish the impact of COVID-19 on service delivery

As part of the interviews related to remote stroke support during COVID-19, those who had experienced remote support during the COVID-19 outbreak felt that there were tangible benefits in receiving this kind of support. One of the key pieces of feedback for this type of support was that individuals did not necessarily need to worry about travel or the accessibility of physical spaces.

Those who did give positive feedback around remote support also acknowledged that extra support for staff to conduct remote sessions would be beneficial. Individuals said that a different skillset was required to provide remote support, and so education in this area for staff was highlighted as an area for improvement. Feedback about remote group sessions often highlighted the importance of the structure of sessions being the key to their success, for example being able to raise

your hand on 'Zoom' to help maintain conversation flow and to stop people talking over each other. A number of interviewees also noted that a benefit of having remote group sessions was that they offered the opportunity to meet others and make connections with people who live in different areas.

Some interviewees had received a mixture of remote and face-to-face support, this being predominantly physiotherapy. These individuals said they could see a 'mixed economy' of support being helpful for others in future. One suggested model for operating in this way was 1 in every 4 sessions being face-to-face.

While there were suggestions that remote support could be a useful addition to face-to-face support, there was a consensus that it would not be an effective substitute for face-to-face meetings. Primarily, this was due to the technology excluding a number of friends and peers who were not able to access it. In addition to this, others referenced that setting up or joining a meeting can also cause additional stress, particularly when the individual is not used to using the technology.

The purpose of undertaking these interviews was to provide a better understanding of the changes to remote services taking place as a result of COVID-19. Whilst the long term provision of these services is still uncertain due to COVID-19, the information gathered can be reflected on as the stroke reconfiguration programme progresses and clarity over how services shall be delivered with consideration to COVID-19 becomes available.

2) Remote co-design group

In response to the initial pieces of public feedback from February and March, the remote co-design group drew out several key talking points. These included placing emphasis on local stroke support catering for family members and carers, and helping to 'rebuild people' to get back to normality. Eight key priorities have been identified to be taken forward as part of the BNSSG Stroke Programme:

- Specific stroke training for staff with more general duties, linked to the Stroke HIT Education Framework (aligned to the HEE Stroke Specific Education Framework)
- Regular contact between GP, patient and carer following a stroke
- Introducing physiotherapy as early as possible
- Information guide for those with experience and their families
- Centralised information point across Bristol, North Somerset and South Gloucestershire (e.g. WellAware)
- Engagement with others who have experience of stroke at earliest available opportunity
- Courses and additional guidance designed by those with experience
- Additional resources for the voluntary sector and focus on addressing additional gaps in support

3) Feedback survey

Following the telephone interviews and co-design group, a short focused survey was distributed to collect quantitative feedback in order to ensure ideas and solutions

proposed during the first stage were reliable across a larger number of people. It was distributed electronically due to COVID-19 via established networks and also to the [Healthier Together Citizens' Panel](#). The Survey covered a range of topics including perceptions on the importance of different aspects of the stroke pathway, feelings towards a single location for stroke services and the importance of receiving support close to home. Demographic monitoring was also in place to allow us to analyse the potential effects of the service change to the different locality, age, gender and ethnic groups.

The key findings from the survey were:

- Respondents felt that all 4 aspects of the pathway (prevention, hyper-acute, acute and rehabilitation and life after stroke) were of equal importance
- The idea of a single location for immediate treatment and monitoring was supported by almost two thirds (64%) of respondents, with the perception that a single location would be a centre of excellence offering specialised care, leading to more efficient treatment and better outcomes for patients
- The main concern stated by respondents when asked about a single centre of excellence or receiving treatment away from home were the issues of travel access, cost and time. Concerns around difficulty and stress travelling after a stroke were also highlighted.
- 96% of respondents agreed that equitable treatment across BNSSG was important, driven by the belief that where you live shouldn't affect the level of treatment you receive.
- When asked about preference for rehab delivery, there was a fairly even split between receiving rehab at home, as close to home as possible and having choice where to receive treatment even if it means being further from home. This shows the importance of flexibility and the need to consider patient choice, a patient's mobility, comfort and individual needs when deciding where rehab support is delivered

Results from the feedback survey allowed assessment and validation of ideas proposed during the previous phases of engagement. The general outcomes from the Phase 2 engagement were shared for feedback with the Stroke Health Integration Team (HIT), and the overall considerations will continue to be deliberated throughout the reconfiguration process. Demographic monitoring during this phase of engagement also highlighted the need for further engagement activity with those from seldom heard groups and higher risk groups, particularly those from BAME community groups.

Further details around the feedback from Phase 2 engagement can be found in Appendix 5

5.5.2 Phase Three – Feedback on draft proposals for consultation – September and October 2020

As the proposals for the reconfiguration of services continue to progress, it was important to ensure that people with lived experience of or impacted by stroke, from across the BNSSG region, were further consulted on the content of the proposals. Summaries of the pre-consultation business case were circulated to 18 service users spread over three different service user groups. After allowing those individuals and

their carers' time to process and respond to the proposals (1-2 weeks), comments were gathered and collated. By early October, most individuals had responded and the comments were collated and themed with clear actions from each, presented in a table. Some of the key themes are listed below. The full list of themed comments and planned actions against each can be found in Appendix 5.

Common and key themes for comment were:

- The prevention element of new services is identified as very important and potentially needing more work or at least further explanation.
- Generalised support for the new acute services and understanding of the need for it
- The key role that family members and carers play in facilitating discharge home and in long term management and support for someone with stroke
- That there is a significant opportunity for educating and training family members and carers before a person with stroke leaves hospital.
- Training and education for the new stroke specialist workforce is vital
- Therapy provision over 7 days per week was unanimously welcomed.
- Transport to hospital and between sites needs to be “quick and safe”
- Parking for visitors is an issue at all hospitals
- Information sharing about stroke and stroke services on offer should be improved in primary care.

The feedback and comments gathered through this targeted engagement of people with lived experience has already helped to improve the proposals, particularly service improvements. The logged comments will continue to be reflected upon through the ongoing process of reconfiguration.

5.5.3 Phase 4 - Targeted engagement with seldom heard and high risk groups – January and February 2021

During January and February 2021 a fourth phase of targeted engagement took place involving those from seldom heard groups and high risk groups. This included individuals from Black, Asian and Minority Ethnic (BAME) communities who had lived experience of a stroke, and individuals with health conditions such as sickle cell disease, diabetes and high blood pressure which increase the risk of stroke. BAME community leaders were also interviewed, alongside health professionals specialising in the management of particular conditions such as sickle cell disease. We found during this phase of engagement that by building relationships and involving active community and healthcare leaders, it has opened opportunities for further engagement with individuals from these groups which we will continue to explore as we move towards consultation. It has also offered the opportunity for these leaders to be invited to sit in stroke programme meetings, to act as a voice for their community and to be involved in the co-production of ideas and proposals.

As detailed in chapter 5.3, a targeted outreach approach has taken place to ensure involvement from those in higher risk and seldom heard groups. The opportunity to participate in this phase of engagement has been distributed and shared with established voluntary and community networks and partnerships across Bristol, North Somerset and South Gloucestershire, as well as through community leaders.

The purpose of these interviews was to gather feedback on the proposed options for the number and location of hyper acute stroke units (HASU), acute stroke units (ASU) and sub-acute units (SSARU), to explore feelings on travel to healthcare services, and to understand what is important when it comes to stroke prevention services. Information was given to participants during this phase on the proposal options in clear and understandable format. Feedback has been gathered verbally through virtual or telephone interviews as well as written. The collation and analysis of feedback has shown the following:

- The average time participants would be willing to travel for a speciality service was one hour
- The idea of a HASU was generally supported; however concerns were raised about the travel implications for both patients and family.
- Two acute stroke units were preferred over one by all participants due to accessibility and perceived increased capacity of in-patient beds.
- Having the two potential ASU sights in Bristol was thought to be unfair on those living in South Gloucestershire and North Somerset, and would have travel implications for patients and their families. Suggestions raised that one ASU should be located at Weston General Hospital
- All those who were interviewed thought three sub-acute stroke units would be the optimal number as it offers a more accessible option for residents and their families across all three local authority areas. (It is important to note that these interviews took place before the final decision for 2 SSARUs was agreed.)
- The importance of having highly trained and experienced staff was highlighted by those with lived experience of stroke during the emergency treatment, inpatient stay and after discharge.
- Ensuring there are good transport links and access for family members at the sites of the HASU, ASU and SARU was emphasised, as the role of family in providing support and reassurance to the patients was identified as significantly important by those interviewed.
- The need for a process to ensure family is supported during this difficult time whilst visiting the HASU, ASU and SSARU was frequently mentioned. This could include the use of video technology to ensure that patients and their families can communicate during times where visitations may be limited.

- Mental health support following a stroke was raised by those with lived experience of stroke, as well as by one participant who is a nurse specialising in sickle cell disease.
- There is a need for additional consideration for the prevention side of the stroke reconfiguration programme. Stroke prevention services should be free and easy to access, with options for group or individual support.
- There is a decreased awareness within the BAME community around stroke prevention, and information and communications around prevention should be tailored and targeted at these groups due to the increased risk seen in this group.

The logged comments, themes and findings will continue to be reflected upon through the ongoing process of reconfiguration. This phase of engagement has also offered the opportunity to build relationships and connections with groups and individuals from seldom heard communities and high risk groups which can continue to be developed as we move into the consultation.

Further details around the feedback to date from Phase 4 engagement can be found in Appendix 5

5.6 Wider Stakeholder Engagement

GP leadership has been combined within the programme from the outset with a GP with specialist interest in stroke chairing the clinical design group meetings. Wider engagement with Primary Care has been undertaken through a number of different mechanisms. These have included attendance of the Programme Team at a 'Primary Care Strategy Group' meeting, presentation of feedback through the CCG GP Members Event, and through the Primary Care Providers Board members undertaking a desktop review of the draft Pre Consultation Business Case document. Work continues with primary care and other service providers in each locality area through the "Locality Integration Meetings" (or similar) that are held between local partner agencies in the six Localities across BNSSG.

The partnership organisation of all GP practices across BNSSG, OneCare, were presented with this pre-consultation business case at their board on 27th January 2021 where the proposals were supported with feedback that was incorporated into the ongoing design process.

Healthwatch has representation on BNSSG CCG Patient and Public Involvement Forum (PPIF) who have been updated throughout the initial stroke reconfiguration programme engagement process, and will continue to be updated on a regular basis. Initial engagement around stroke took place in partnership with the Stroke Health Integration Team (HIT) with the PPIF during January 2020 to review the pre-engagement plan and initial key learnings. Challenges and builds were also provided by the group to aid with the planning of the February engagement "What Matters

Most?" event. In August 2020 the PPIF was then provided with an overview of all engagement work done up to that point, reviewing key themes and learnings to help identify the next steps of engagement. During the PPIF meeting on the 25th of February 2021, an overview of the consultation timings and broad consultation plan was delivered for thoughts and builds. A further update was then provided in May 2021 to the consultation comms and engagement Equality Impact Assessment, consultation timetable and survey. Interim consultation results will then be shared half way through the consultation (roughly mid-July) with the PPIF for reflections on initial findings. This will allow the opportunity for discussion and analysis on themes to date, as well as helping to identify any groups or areas which may need further engagement. Conversations are also currently taking place with Healthwatch to establish the role of Healthwatch in the consultation, and to see how they can support the delivery of the communications and engagement.

The regional Health Overview and Scrutiny Committee has been consulted and updated throughout the programme work –details can be found in chapter 14 Governance and Assurance.

Engagement with the third sector has also followed through the whole process with engagement occurring with a range of local charities whose activity covers support for people with stroke, including Different Strokes Bristol, Headway Bristol, Bristol After Stroke and The Stroke Association. The latter two organisations have been brought together through the programme work resulting in collaboration to produce a new offer for delivery of keyworker roles as an integrated part of the Integrated Community Stroke service described later in this document in chapter 10 Service Improvement. Representatives from The Stroke Association and Bristol After stroke sit on the programme board and are present at a wide range of programme meetings, including design groups, and the Life After Stroke work-stream, alongside representation from Headway Bristol.

In advance of the public consultation, there will be targeted communication with care home managers and staff, likely via the Care Provider Cell of the CCG. This will ensure that the positive messages about the reconfiguration of stroke services and the likely impacts on flow of people with stroke and the support services that will be available to them in care homes can be shared as well as key messages and learning received from those currently caring for people with stroke in nursing and residential settings long term.

5.7 Engagement Summary

To date there have been 4 phases of engagement; Table 9 summarises these phases. Further details about the engagement outcomes can be found in Appendix 5.

Table 9 - Four phases of engagement activities

Phase	Dates	Groups Engaged	Engagement Method
1	February / March	Those recovering from stroke, clinicians, members	Attendees primarily fed back through verbal communication

	2020	of the public, carers and those from the third sector	at public meetings which was transcribed by CCG staff and other volunteers. In situations where this was not possible or preferred, attendees were able to write down their views and experiences.
2	June / July 2020	1. Those with lived experience accessing remote stroke support 2. Those with lived experience of stroke and 1 family member 3. The wider public through the Healthier Together Citizens Panel	1. Telephone interviews 2. Remote co-design group meeting run virtually 3. Online survey
3	September / October 2020	Service users with lived experience of stroke	Written feedback
4	January / February 2021	Seldom heard and high risk groups	Interviews (video and telephone) Written feedback

5.7.1 Key Learnings from engagement phases 1-4

Throughout the first four phases of engagement several themes have become clear:

1. Clear and well planned support after leaving hospital following a stroke is vital. This includes physiotherapy, speech and language support and psychological support
2. The prevention element of new services has been identified as very important and potentially needing more work or at least further explanation.
3. The idea of a centralised point for the HASU is generally supported with the perception that it will be a centre of excellence offering specialist care
4. Concerns about accessibility and travel have been consistently raised, particularly for those living in North Somerset and South Gloucestershire. This relates to both the patients and friends or family visiting the patients at the HASU, ASU or SSARU units.

The BNSSG Stroke Programme will continue to build and explore these themes further as engagement activity continues. Findings from engagement have been regularly fed back for reflection to the programme board, and will continue to be considered during decision making.

5.7.2 Engagement next steps

It is recognised that further engagement is needed with certain groups leading up to the consultation to make sure that a representative voice is reflected within the

engagement activity. Table 10 details further groups that the BNSSG Stroke Programme is engaging with over the next phase of the programme and before a public consultation commences. It also details the engagement channels and methods that will be used.

Table 10 - Further groups that the BNSSG Stroke Programme is engaging with over the next phase of the programme

Target Group	Engagement Channels	Engagement Methods	Engagement Focus / Outcome
Seldom heard groups	Sharing messaging and opportunity to provide feedback through: <ul style="list-style-type: none"> • Community and faith leaders • Community and voluntary sector organisations • Local community groups • The Healthier Together Citizens Panel • Local Authority Partners • Social media 	<ul style="list-style-type: none"> • Interviews • Focus groups • Written and verbal feedback for those who may be digitally excluded • Surveys • Invitation to work stream meetings for community leaders 	To gain insight on the experiences of those from seldom heard communities around accessing healthcare, and to gather feedback on latest proposals.
High risk groups (including those with disabilities)	<ul style="list-style-type: none"> • Local support groups • Community and faith leaders • Community and voluntary sector organisations • The Healthier Together Citizens Panel • GPs identifying suitable patients • Social media 	<ul style="list-style-type: none"> • Interviews • Focus groups • Written and verbal feedback • Surveys • Invitation to work stream meetings for community leaders or support group leads 	Increased understanding around importance and preferences of prevention services, and insight on individuals experiences accessing healthcare services
Staff	<ul style="list-style-type: none"> • Organisational networks • Staff engagement events • Staff network, including groups such as BAME staff networks and disability forums • Social media 	<ul style="list-style-type: none"> • Staff engagement sessions to provide opportunity for Q&A and gathering feedback • A short video update with key spokespeople sharing the programme update, an overview of the 	To inform staff of latest proposals, to gather feedback and to provide response and reassurance to any questions

		PCBC, key programme milestones and what this means for staff <ul style="list-style-type: none"> Any additional messaging through organisational and staff networks 	
Current patients and staff working within stroke services	<ul style="list-style-type: none"> Access to staff working in stroke through operational and clinical leads Members of the clinical design group Current patients via staff working in inpatient and community teams 	<ul style="list-style-type: none"> Survey and discussion with staff groups. Phone call Staff interactions with current patients 	Trials of patient reported outcome measures (PROMS) has been raised in the clinical design group and need engagement with staff and current inpatients. These trials will give baseline data and determine which tool to use for future measurement, and will permit systematic evaluation ongoing through until and beyond implementation of the proposed services.

5.8 Planning for formal consultation

The proposals for reconfiguring the BNSSG stroke service are significant. Therefore, from the outset, the programme has planned to include a public consultation on the proposals for change. The public consultation will be undertaken in line with NHSEI guidance on “Planning, assuring and delivering service change for patients”⁴³; the draft consultation plan can be seen in Appendix 7.

During the consultation there will be a consultation document and summary available to the public which will clearly lay out what the changes in the service provision are, why these changes are happening and the impacts of these changes to service users. It is vital that these documents are accessible and presented in a way that is understandable to people separate to the stroke reconfiguration programme and healthcare settings. These documents will also seek feedback and promote the

⁴³ <https://www.england.nhs.uk/wp-content/uploads/2018/03/planning-assuring-delivering-service-change-v6-1.pdf>

various other methods by which people can engage in the consultation as seen in Appendix 7.

The public consultation will ensure that there is good opportunity to hear from members of the public, service users, staff and patient groups, particularly including higher risk and seldom heard groups, as outlined above and in Appendix 7, who will be targeted in ongoing engagement work leading up to the public consultation. The programme is committed to listening to people and will ensure that all the feedback from the consultation is collated and independently reviewed before being fed back to system partners. The final Decision Making Business Case will demonstrate how the feedback has been taken on board when it puts forward the final clinical model for system-wide decision.

6 Prevention of stroke

6.1 Background

The National Clinical Guideline for Stroke recognises prevention as an important component of this pathway⁴⁴. Prevention is the first step to improving care and outcomes for patients within BNSSG. Supporting people to live a healthy lifestyle and ensuring there is greater awareness of stroke and its symptoms will help to reduce the number of strokes.

Up to 70% of strokes could be prevented by the detection and effective management of hypertension, atrial fibrillation, diabetes, weight management, cholesterol and lifestyle factors such as smoking, exercise and poor diet⁴⁵.

Deaths related to stroke have declined by 49% in the past 15 years.⁴⁶ This has been accredited to a combination of better prevention, earlier and more advanced treatment. Although this decline is a positive trend, stroke survivorship is creating significant challenges to the health and social care system, the economy, and for stroke survivors and their families and carers.

This section draws on population health management data, describes work that has already been initiated and puts forward proposed interventions for BNSSG to consider in order to reduce the rise in stroke cases expected in this area, in line with national trends.

Appendix 3 lists the benchmarking opportunities in more detail and provides more detailed analysis of stroke incidence and prevalence across BNSSG.

6.2 Population Health Management

The case for change describes the increasing stroke incidence in BNSSG and prevalence of key risk factors associated with stroke within the population. The Stroke Association highlights the predicted increases over the coming years due to an increasingly ageing population, which can be seen in Figure 12.⁴⁷

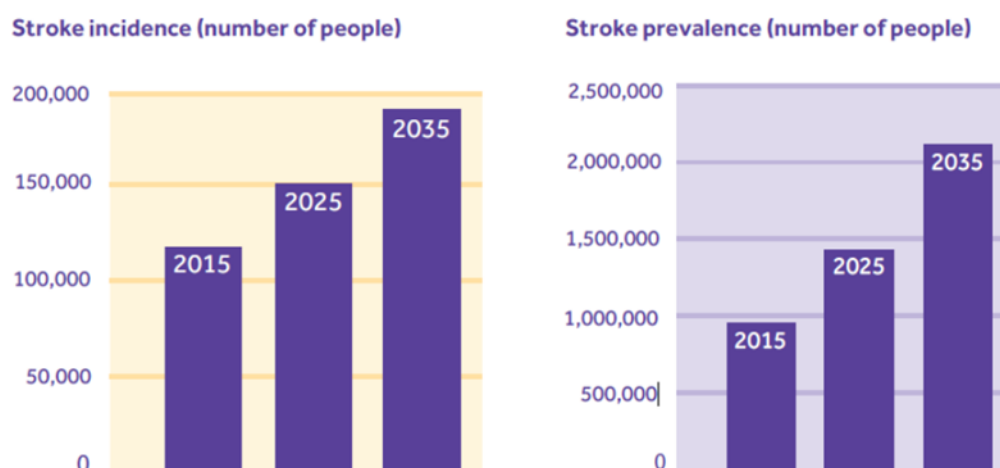
⁴⁴RCP, 2016 National clinical guideline for stroke Accessed: [https://www.strokeaudit.org/SupportFiles/Documents/Guidelines/2016-National-Clinical-Guideline-for-Stroke-5t-\(1\).aspx](https://www.strokeaudit.org/SupportFiles/Documents/Guidelines/2016-National-Clinical-Guideline-for-Stroke-5t-(1).aspx) National Clinical Guideline for Stroke

⁴⁵ <https://www.england.nhs.uk/ourwork/clinical-policy/stroke/>

⁴⁶ BMJ, 2019 Determinants of the decline in mortality from acute stroke in England: linked national database study of 795 869 adults

⁴⁷ https://www.stroke.org.uk/sites/default/files/costs_of_stroke_in_the_uk_report_-_executive_summary_part_1_v2.pdf

Figure 12 - Changing Incidence and prevalence of Stroke (UK)



In order to manage this increase, targeted prevention strategies need to be enacted, working in collaboration across the health and social care system. It is important that the risk factors⁴⁸ associated with stroke are managed as part of primary prevention. This includes addressing stroke risk factors and working closely with public health in relation to lifestyle factors. There are commonly two approaches to primary stroke prevention:

- Supporting people to undertake lifestyle changes
- Encouraging at-risk people to take preventive medication (that is, lipid-lowering, anticoagulant and antihypertensive drugs)

In addition, the different needs of people from diverse ethnic backgrounds, including those with sickle cell disease, must be considered.

Secondary prevention (preventing recurrence after a first stroke) is also important. If people have had a stroke or TIA in the past, the risk of having another stroke is greatly increased.

Better control of the risk factors associated with stroke and increased use of preventative medicines have, together, resulted in a 40% reduction in major stroke over the past 20 years⁴⁹. However, the British Association of Stroke Physicians forecast that the incidence of stroke will continue to rise by 2.4% per annum⁵⁰.

Targeting effective stroke prevention

Men, older people, black ethnic groups, and those of lower socioeconomic status have higher risk of stroke. Stroke is more common in men (51%) than women (49%) except in the highest age range. Stroke incidence increases with age: 3% of the total strokes occurred in people aged under 40, 38% in people aged 40 to 69, and 59% in people aged over 70. However, statistical trends show that strokes are occurring at an earlier age: age at onset fell from 70.5 to 68.2 in males and 74.5 to 73 in females

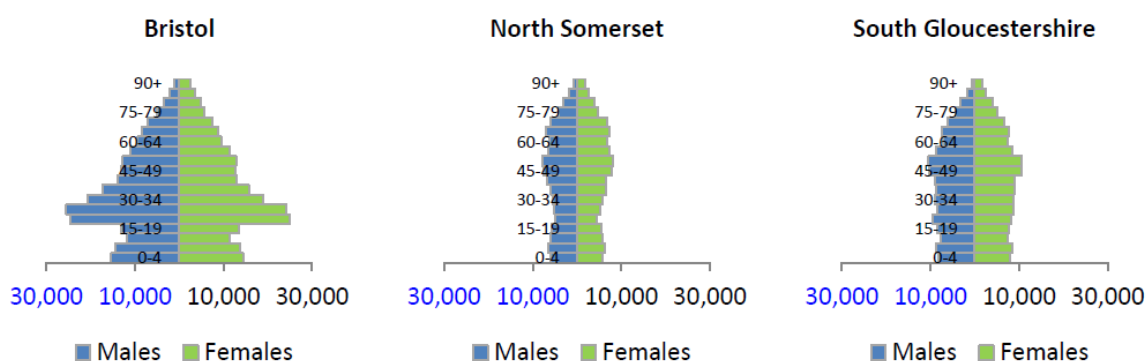
⁴⁸ <https://cks.nice.org.uk/topics/stroke-tia/background-information/risk-factors/>

⁴⁹ Rothwell P. Preventative measures against stroke can reduce stroke incidence. *Lancet* 2004; 363:1925-33

⁵⁰ [costs_of_stroke_in_the_uk_summary_report_0.pdf](#)

between 2007 and 2016. People of black ethnic origin have almost twice the incidence of stroke as white people, experience more severe strokes and are liable to have their first stroke up to 11 years earlier. Around 80% of stroke patients came from socio-economically deprived backgrounds. 75% of patients with acute stroke admitted to hospital in the UK have at least one co-morbidity and one in ten have at least three.

Figure 13 – Population pyramids for the three BNSSG local authority areas



BNSSG population pyramids, ONS, mid-2017 estimates. Pyramid widths are proportional to population size [source: Healthier Together Five Year Plan 2019-2024]

The population pyramids show that Bristol has a proportionally younger population whilst South Gloucestershire and North Somerset have larger proportions of older adults. This leads to higher incidence and risk of stroke per 1000 residents in South Gloucestershire and North Somerset. However, because of Bristol’s larger overall population, areas of relative deprivation and greater ethnic diversity, the total number of people having strokes (and at risk of stroke) are highest in Bristol, as seen in Table 11 below:

Table 11 - Incidence and risk of stroke by local authority area

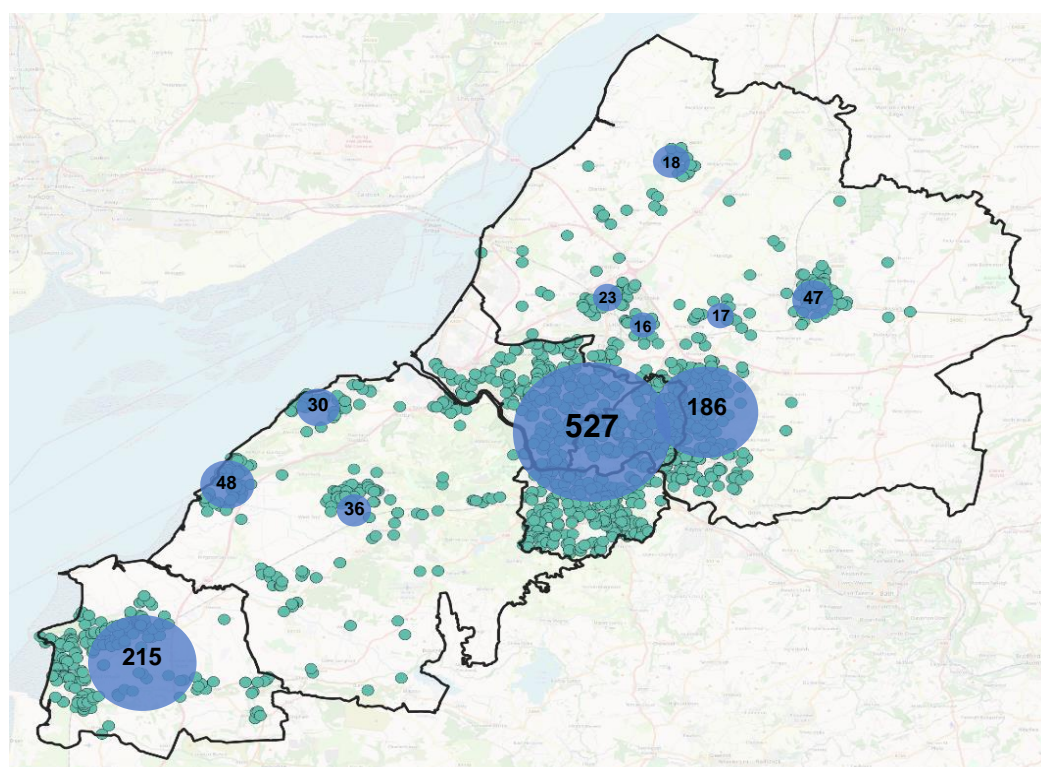
Local Authority	Stroke 2019/20	Stroke %	High risk	High risk %	Registered people	Registered %	Stroke 2019/20 (per 1,000)	High risk (per 1,000)
S Glos	323	6	44,030	32	290,858	29	4.8	151
N Som	388	1	41,455	30	220,437	22	5.1	188
Bristol	527	3	53,509	38	496,323	49	3.0	108
Total	*1238		138,994		1,007,618			

*Using hospital admissions data for the three BNSSG hospitals Apr 2019 – Mar 2020 and HRG Stroke codes AA35A to F, the BI team identified 1238 stroke patients with map-able BNSSG postcodes.

It is notable that, whilst North Somerset has the smallest population within BNSSG (22%), both the incidence of stroke in 2019/20 and the numbers of people at risk of stroke (31% and 30% respectively) are disproportionately high, reflecting North Somerset's comparatively large population of older people.

Of the 2019/20 North Somerset patients, the largest number (215) came from the most southerly district: Weston, Worle and the surrounding villages. This area (particularly parts of Weston) has high levels of socio-economic deprivation and the longest travel times to Bristol, which people might find difficult. There is no equivalent disadvantaged population in the northernmost part of BNSSG (South Gloucestershire): in this authority, the largest clusters of stroke patients and areas of greatest deprivation are within, or adjacent to, the urban development of Bristol. The pattern of home locations of people who had strokes in 2019-2020 across BNSSG is shown in Figure 14 below.

Figure 14 - Location of Stroke patients, 2019-20, showing locality boundaries and counts for main centres



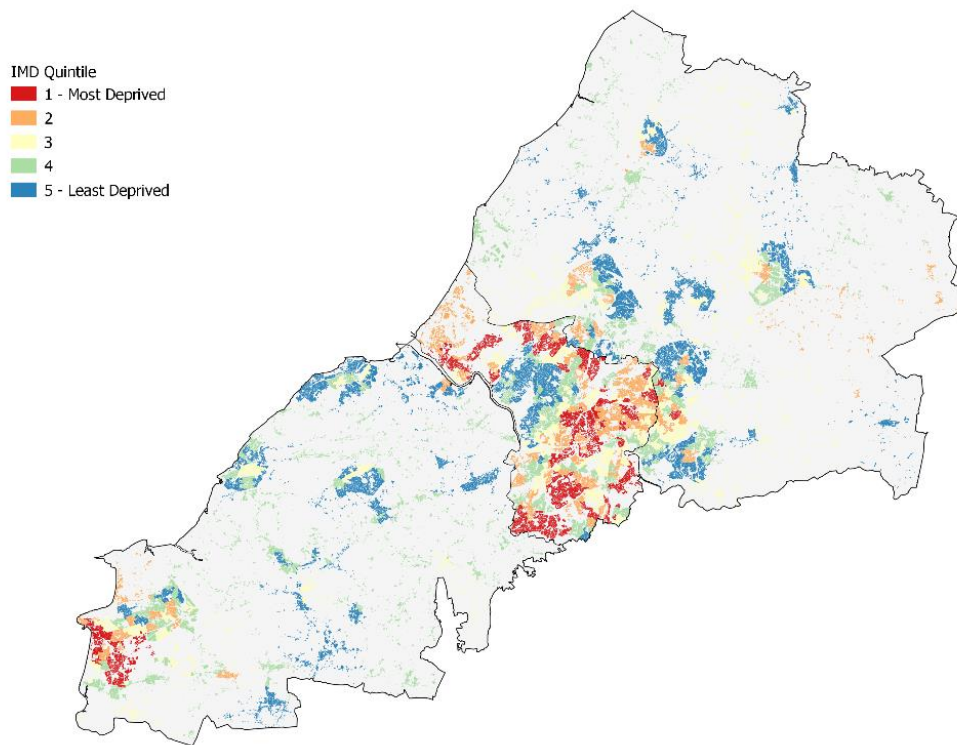
6.3 Health Inequalities

Commissioners and providers of healthcare have a responsibility to ensure that the people who most need healthcare support can access it. Population health management data and travel time information formed a key component of the clinical evaluation process; this is detailed in Chapter 7.

Tackling inequality in health is a high priority for Healthier Together. As indicated through the EIA (Appendix 6) certain patient groups are at a higher risk of stroke, some of which are listed below:

- Older people – BNSSG has an ageing population, particularly in North Somerset. The predicted prevalence of stroke in North Somerset has an annual growth rate of 4.4% in the 75+ population⁵¹
- People with different ethnic heritage - studies show that black African and south Asian people are more likely to have a stroke than white people⁵² (in part due to stroke risk factors). African Caribbean people are more likely to have high blood pressure.⁵³
- Inequality - In general, people from more deprived areas have an increased risk of stroke.⁵⁴ It is also known that those from deprived areas are more likely to be disproportionately affected by COVID-19.
- Other risk factors - Smoking doubles the risk of having a stroke.

Figure 15 - Map of deprivation in BNSSG by LSOA, measured by Index of Multiple Deprivation (IMD)



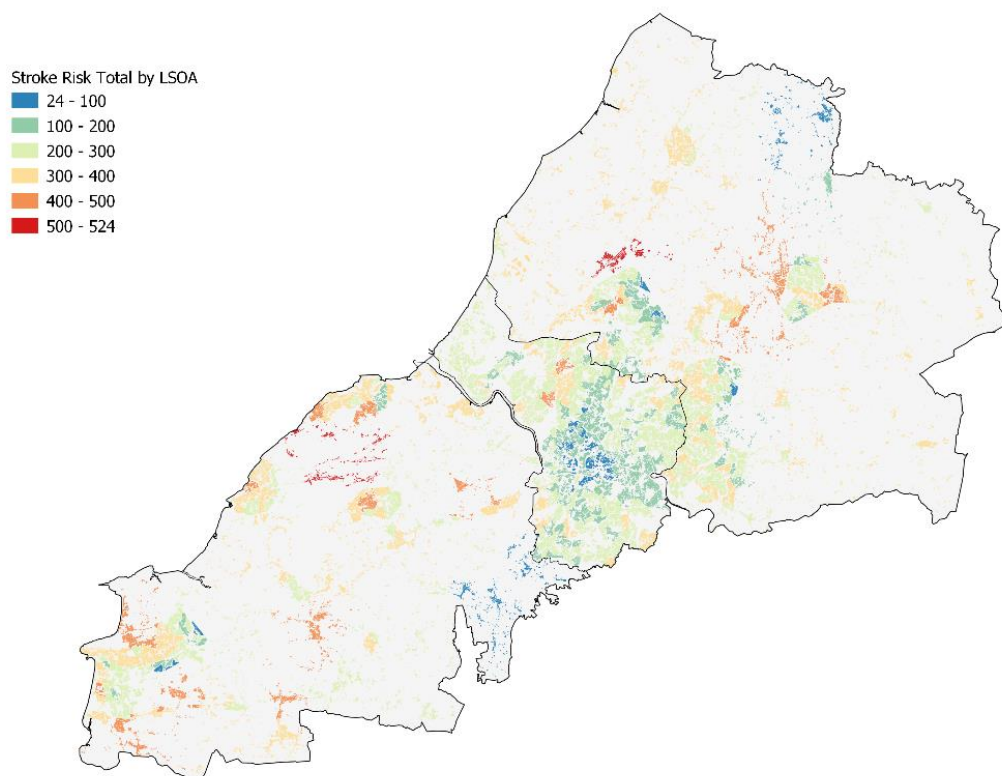
⁵¹ North Somerset JSNA – Disease Prevalence Models Accessed: <https://www.n-somerset.gov.uk>

⁵² State of the Nation Stroke statistics - February 2018. Accessed: https://www.stroke.org.uk/sites/default/files/state_of_the_nation_2018.pdf

⁵³ <https://www.stroke.org.uk/what-is-stroke/are-you-at-risk-of-stroke/stroke-and-african-and-caribbean-people>

⁵⁴ Marshall IJ, et al (2015). The effects of socioeconomic status on stroke risk and outcomes. *Lancet Neurology* 14: 1206-1218

Figure 16 - People at high risk of stroke, by LSOA, including people aged 70+ and younger adults with co-morbidities



Commissioners and providers of healthcare have a responsibility to ensure that the people who most need healthcare support are able to access it. The population health management data and travel time information formed a key component of the clinical evaluation process, which is detailed in Chapter 7.

6.4 Collaborative Project (BP Management and AF Detection)

In 2018 a project was launched in collaboration with the CCG and the West of England Academic Health Science Network (AHSN). The project supported Primary Care by developing an EMIS template for healthcare assistants (HCAs) to use to organise and undertake a range of tests aimed at selected patients considered to have possible hypertension or atrial fibrillation (AF), in order to reduce the incidence of stroke across BNSSG.

Following on from this project, an additional proposal is being worked up to further prevent the occurrence of CVD / Stroke. There are currently two areas under development:

- **Blood Pressure Management**

Right Care data for 2017-18 states that there is an opportunity for 386 stroke/TIA patients to have blood pressure to target levels of 150/90 or less for BNSSG CCG to reach similar standards to the best performing similar 10 CCGs.

With compelling evidence that lowering blood pressure reduces the risk of a stroke, and that blood pressure control can be improved through self-management and potentially self-adjustment of medication dosing, the project group are designing and developing a project linked to targeted blood pressure management through self-monitoring.

Funding is available for implementation of this project in 20/21. The project is currently in design phase to ensure the optimal outcomes are achieved and further detail will be refined through the consultation phases with input from the West of England Applied Research Collaboration (ARC) and Bristol Health Partners Stroke Health Integration Team.

- **Atrial Fibrillation**

The estimated prevalence of AF in BNSSG is around 2.4% meaning that approximately 23,000 people in BNSSG have AF. As highlighted in Appendix 3, RightCare data suggests BNSSG is comparable to similar CCGs in its detection of atrial fibrillation, however the data still represents an opportunity.

Two projects relating to AF and stroke prevention are ongoing in BNSSG:

- I. People admitted with stroke with a prior diagnosis of AF but not anticoagulated are identified and a root cause analysis undertaken to find out why anticoagulation was not prescribed. This will lead to an intervention to improve use of anticoagulation in people with AF.
- II. A local algorithm has been developed for choice of anticoagulant in people with atrial fibrillation, in order to use the most clinically appropriate drug while also reducing cost.

A further project is under development with the company iRhythm who have secured NHSX/AAC funding for evaluation of their Zio service, including its use for AF detection after stroke. This involves wearing an ambulatory monitor (device / patch) that continually monitors a patient's heart rhythm for a prolonged period to look for any arrhythmias, with electronic reporting and analysis.

The evaluation will be carried out by the King's Technology Evaluation Centre (KiTEC) and will investigate the implementation and cost effectiveness of the Zio service. Detailed planning is in progress, with Southmead Hospital expected to be one of three English NHS Trusts taking part in this evaluation.

6.5 Proposed Interventions

The NHS Long Term Plan identifies cardiovascular disease (CVD) as a clinical priority and the single biggest condition where lives can be saved over the next 10 years. Stroke prevention will be a central part of this strategy. Across BNSSG, the identification and management of stroke risk factors is encouraging, however, there is room for improvement: increasing the identification and treatment of AF and hypertension will reduce the incidence of stroke.

Further targeted areas of prevention work in order to mitigate the predicted rise include:

- Working towards people routinely knowing their “ABC” numbers- (AF, blood pressure and cholesterol).
- Improving the effectiveness of approaches such as NHS Health Checks to rapidly treat those identified with the high risk conditions, including AF, high blood pressure and high cholesterol.
- Supporting pharmacists and nurses in Primary Care Networks to find and treat people with high risk conditions and offer treatment in a timely way.
- Commissioning a new national CVD prevention audit for primary care called ‘CVDPrevent’ which will extract routinely recorded but anonymised GP data, making it easier for practices and Primary Care Networks to systematically identify people whose treatment could be improved and risk reduced.
- Offering further support to secondary prevention of stroke and avoidance of recurrent stroke – which the proposals for change will support through improved community and life after stroke provision.



7 Developing the clinical model for Stroke Services in BNSSG

The proposed clinical model for stroke services has been developed by a partnership of clinicians, people with lived experience and other health and social care staff from across the BNSSG health system. A significant amount of work has been done to create evidence based proposals for the acute hospital configuration, but the most transformational development is the proposed improvement to community provision.

The new Integrated Community Stroke Service (ICSS) directly responds to what people in the BNSSG area have told the programme that they want for stroke care and the description, provided in Chapter 10, is a step change in how community, social services and the voluntary sector will work together as one community based system to support people after a stroke. As a service improvement, the health and care system in BNSSG would want to start implementing the changes proposed to community care ahead of the proposals under consultation and Sirona Care and Health are already working to align the service offer for people across BNSSG as part of their community services transformation programme.

The ICSS will provide the foundation of the BNSSG service and allow patients to move swiftly through immediate and acute treatment for stroke, enabling longer-term rehabilitation needs to be met at home and in community based sub-acute rehabilitation units that are closely integrated with other local services. However, this alone will not meet the case for change and in order to ensure the highest quality of immediate and acute care for local people there needs to be a reduction in the number of stroke-receiving units, and a resultant increase in the number of patients being received at high-quality specialist centres. Evidence shows that reorganising stroke services and creating large Hyper Acute Stroke Units (HASUs) with the equipment and expertise to treat patients all day, every day, can save lives and improve outcomes.⁵⁵

In order to objectively determine the most clinically effective configuration of stroke services, the BNSSG Stroke Programme has undertaken a detailed clinical evaluation process to determine a preferred configuration of stroke care across BNSSG.

⁵⁵ Stroke Association - What we think about: Reorganising acute stroke services

7.1 Clinical Evaluation Process

The clinical evaluation process involved evaluating the three inpatient phases of the patient pathway (noting that community care is also delivered in peoples' homes):

Figure 17 - Phases of Stroke Care



- 1) **Hyper-acute care** – evaluate the options available for a specific HASU for BNSSG
- 2) **Acute care** – evaluate the options available for Acute Stroke Unit (ASU) provision across BNSSG. Acute hospital ward based care that follows HASU level care.
- 3) **Sub-acute care (bedded)** - evaluate the sub-acute rehabilitation unit (SSARU) number and location options within BNSSG.

The clinically led process used established evaluation criteria that were developed in conjunction with local people and clinicians as part of the BNSSG Healthy Weston Programme. These evaluation criteria were agreed by the Joint Health Overview and Scrutiny Committee (JHOSC) on 26 September 2018. These evaluation criteria were tailored to the BNSSG Stroke Programme with the support of specialist stroke clinicians and people that had lived experience of stroke in order to ensure that they were appropriate for application to stroke services. People with lived experience of stroke are a central part of the BNSSG Stroke Programme Board and therefore played a fundamental role in ensuring the evaluation criteria reflected the aspects of care that were most important to service users.

The full evaluation criteria that were used to assess the service models can be seen in Appendix 4. Figure 18 provides an overview of the criteria that are most closely associated with the feedback received from patients and carers as part of the engagement activities the programme undertook.

Figure 18 - Evaluation criteria that are most closely associated with the feedback received from patients and carers

1

Sub-criteria: Quality of Care

Evaluation criteria	Questions to test
<ul style="list-style-type: none"> Clinical effectiveness 	<ul style="list-style-type: none"> Will this option lead to people receiving equal or better quality care/outcomes of care in line with national guidance standards or best practice? Will this option result in more effective prevention in order to improve life expectancy in the system and reduce health inequalities? Will this option account for future changes in the population size and demographics? Will this option lead to more people being treated by teams with the right skills and experience?
<ul style="list-style-type: none"> Patient and carer experience 	<ul style="list-style-type: none"> Will this option improve continuity of care for patients? (e.g., reduce number of hand offs across teams / organisations, increase frequency of single clinician / team being responsible for a patient)? Will this option enable greater opportunity to link with voluntary / community sector health and wellbeing services? Will this option improve quality of environment in which care is provided?
<ul style="list-style-type: none"> Patient safety 	<ul style="list-style-type: none"> Will this option allow for patient transfers/emergency intervention within a clinically safe time-frame? Will travel time impact on patient outcome? Will this option offer reduced levels of risk (e.g., staffed 24/7 rotas, provide networked care, implement standardization)?

2

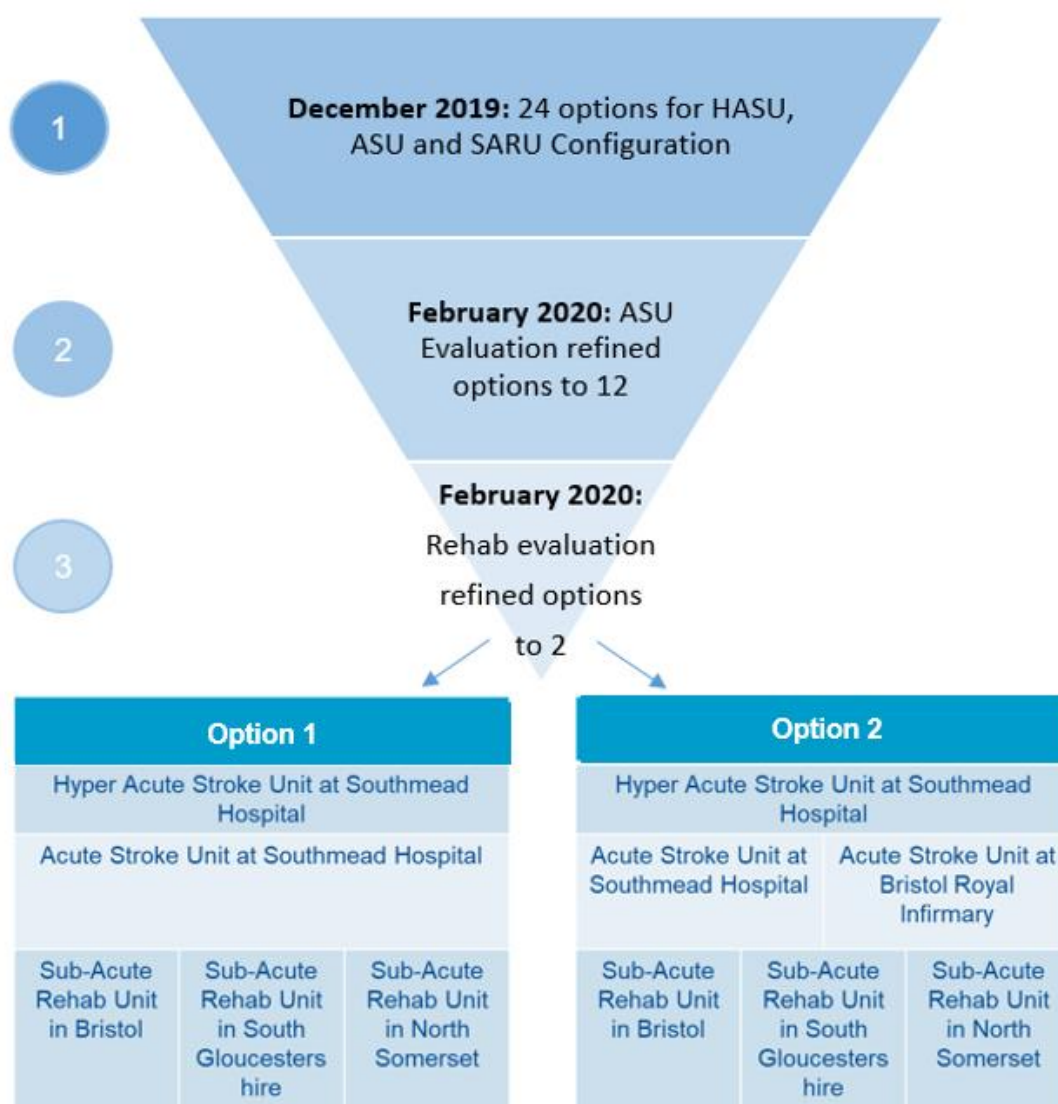
Sub-criteria: Access to Care

Evaluation criteria	Questions to test
<ul style="list-style-type: none"> Impact on patient choice 	<ul style="list-style-type: none"> Does this option increase or decrease choice for patients? Will this option make it easier for people to understand which services they can access when and where?
<ul style="list-style-type: none"> Distance, cost and time to access services 	<ul style="list-style-type: none"> Will this option increase/reduce travel time and/or cost for patients to access specific services? Will this option involve patients travelling more/less frequently, change the number of journeys to access urgent medical intervention? Will this option reduce/increase patients' waiting time to access services? Will this option increase/reduce travel time and/or cost for carers and family? Will this option support the use of new technology to improve access?
<ul style="list-style-type: none"> Service operating hours 	<ul style="list-style-type: none"> Will this option improve operating hours for the service? Does the option reduce the risk of unplanned changes and improve service resilience? Does the option maintain or enhance the ability of the service to adapt to planned or envisaged future changes?

Where a negative impact was seen, for example: moving to a more centralised service offer reduces patient choice. Careful scrutiny was given to the clinical benefits that that led to, i.e. access to life-changing interventions, such as thrombectomy (which is only provided at Southmead Hospital) was deemed to be a greater advantage of the new model than reducing choice for patients – particularly when there is evidence that people from parts of BNSSG do not always benefit from access to specialist stroke support currently. This was supported by the feedback from service users, 96% of which agreed that equitable treatment across BNSSG was important. This was driven by the belief that where a person lives shouldn't affect the level of treatment they receive (Section 5.5.2). 64% of respondents also support the idea of a single location for immediate treatment and monitoring, with the perception that a single location would be a centre of excellence offering specialised care, leading to more efficient treatment and better outcomes for patients (Section 5.5.2).

The use of the evaluation criteria to assess the options for configuration of stroke services enabled clinicians to reduce the number of variations under consideration to 2. This process, and the options that emerged, can be seen in Figure 19. More detail about the stages of this process is given in sections 7.2 to 7.4.

Figure 19 - Clinical Evaluation Process



7.2 HASU Evaluation

The BNSSG Stroke Programme conducted a clinically led appraisal workshop on 2nd May 2019 comprising of health and care system partner organisations, stroke clinicians, and patient and public representatives. The group reviewed the feasibility of different designated HASU combinations across BNSSG. The various permutations of either 1, 2 or 3 HASU facilities are shown in Figure 20.

Figure 20 - HASU options in BNSSG

HASU	Location	
1 HASU	Southmead Hospital	
	BRI	
	Weston Hospital	
2 HASU	Southmead Hospital	BRI
	BRI	Weston Hospital
	Southmead Hospital	Weston Hospital
3 HASU	Southmead Hospital + Weston Hospital + BRI	

The NICE Guidance for stroke and transient ischaemic attack (TIA) in over 16s was updated and published on 1st May 2019⁵⁶, and provides best practice guidance for specialist intervention following the onset of stroke or TIA. This guidance formed the basis of the HASU evaluation process.

7.2.1 HASU Evaluation Outputs

The following outputs were agreed in relation to Hyper Acute Stroke Unit or Units across BNSSG:

- The group agreed that two or more HASU's would not meet the guidelines on number of admissions to make the units sustainable, nor be cost effective for the system.
- Based on the current longstanding workforce challenges and workforce need for a HASU the group agreed that more than one HASU would be difficult to staff and agreed to recommend one HASU for BNSSG;
- The group accepted that North Bristol Trust (NBT), Southmead Hospital, was the most suitable location for the HASU because this is where the specialist thrombectomy and neurosurgery services are based and the specialist staff and equipment are available.

The clinically preferred option which had the consensus of the evaluation group was therefore a single HASU based at Southmead Hospital.

7.3 ASU Evaluation

Two workshops, comprising clinicians from all stroke healthcare provider organisations, took place in January and February 2020, with the task of evaluating the options available for Acute Stroke Unit (ASU) provision across BNSSG.

⁵⁶ <https://www.nice.org.uk/guidance/ng128/resources/stroke-and-transient-ischaemic-attack-in-over-16s-diagnosis-and-initial-management-pdf-66141665603269>

Workshop 1, held on 14th January 2020, confirmed the four options which would be evaluated, described the evaluation process, reviewed the evaluation criteria and confirmed the assumptions and information required in order to undertake the evaluation itself.

In the intervening weeks, the following activities were undertaken to support a successful evaluation:

- An evidence pack was developed to support the evaluation process.
- A “minimum service requirement” was developed with the medical leads from each of the Acute Trusts in order to be clear on the minimum service that would need to be maintained to support inpatients with a stroke that cannot be moved in an organisation without a HASU or an ASU. This was later renamed the “Acute Stroke In-Reach Standard Operating Procedure”.
- A series of assumptions were confirmed that would enable the ASU evaluation to be completed, these included the following:
 - Patients will typically remain on the HASU for no longer than 72 hours
 - HASU patients from outside BNSSG will be repatriated for ASU care
 - All suspected stroke patients who it is appropriate to move will access the HASU including so called stroke mimics
 - GPs can refer directly to the HASU
 - Thrombectomy will be provided for an area larger than BNSSG
 - Patients will typically leave the ASU as soon as they are medically fit to do so
 - The rehabilitation service will deliver in accordance with national standards
 - Adequate specialist sub-acute rehabilitation beds will be provided
 - Adequate ongoing support and care will ensure timely discharge from the ASU

Workshop 2 was held on 13th February 2020 to evaluate the four options available for the location of the Acute Stroke Unit(s) (ASU) within BNSSG. The discussion was facilitated by an experienced independent clinical chair, Prof. Andrew Cant, Chair of the North East Clinical Senate.

The four options that were evaluated are shown below in Figure 21.

Figure 21 - ASU Evaluation Options

Option One	Option Two
Hyper Acute Stroke Unit at Southmead Hospital	Hyper Acute Stroke Unit at Southmead Hospital
Acute Stroke Unit at Southmead Hospital	Acute Stroke Unit at Southmead Hospital
	Acute Stroke Unit at the BRI
Option Three	Option Four
Hyper Acute Stroke Unit at Southmead Hospital	Hyper Acute Stroke Unit at Southmead Hospital
Acute Stroke Unit at Southmead Hospital	Acute Stroke Unit at Southmead Hospital
Acute Stroke Unit at Weston Hospital	Acute Stroke Unit at the BRI
	Acute Stroke Unit at Weston Hospital

The group reviewed the evidence and assumptions associated with the review and conducted a clinical and operational review leading to a consensus view on how each of the four options “scored” (better or worse, not numerically) in comparison to the current state.

7.3.1 ASU Evaluation Outputs

The clinical evaluation process for the ASU scored Option 1 (a single ASU, co-located with the HASU on the Southmead Hospital site) the highest for stroke patient care. Option 2 (an ASU on the Southmead Hospital site and a second ASU on the BRI site) scored second highest and has benefits for BRI patients that would be unable to transfer to the HASU from the BRI site as a result of their other specialist care needs that can only be treated in the BRI, such as specialist cardiac care provided at the Bristol Heart Institute.

Figure 22 - Refined ASU Evaluation Options

Option One	Option Two
Hyper Acute Stroke Unit at Southmead Hospital	Hyper Acute Stroke Unit at Southmead Hospital
Acute Stroke Unit at Southmead Hospital	Acute Stroke Unit at Southmead Hospital
	Acute Stroke Unit at the BRI

It was clinically evaluated that Weston Hospital would not be a viable option for future ASU level stroke care. Patients from Weston Hospital do not typically have complex co-morbidities that require specialist care on site and could (usually) be safely transferred in order to receive specialist stroke care in line with national best practice. This is an important distinction in comparison with the BRI where around 60 patients a year would be unable to be transferred as a result of a critical interdependency with another BRI specialist services (e.g. specialist cardiac care). As a result of this Options 3 and 4 which include an ASU based at the Weston Hospital site were not considered to be feasible and have therefore not been recommended for further consideration.

The scoring for Option 1 was based on the following observations:

- A single ASU solution reduced handovers and transfers of care in the clinical pathway for stroke patients and would therefore support improved outcomes.
- A single ASU solution maintained a larger workforce pool on a single site, which had benefits associated with training and development, efficiency and gives improved operating hours to ASU patients.
- A single ASU would support standardisation of care pathways and enable the development of strong links with community services.

For Option 1 to be successful, it was deemed essential that specialist stroke care provision be maintained to those patients that cannot be moved from the BRI site. Furthermore, provision would have to be made for care to non-stroke patients (neurology conditions, acquired brain injuries) whose care is currently overseen by the specialist stroke clinicians at the BRI. These items are taken into consideration in the workforce and financial analysis for this option. Travel times associated with North Somerset were also highlighted and it was determined that specialist community inpatient rehabilitation should be provided in the south of the BNSSG area.

The scoring for Option 2 was based on the following observations:

- This option provides on-site specialist stroke support to patients cared for under other primary specialities on the BRI site, e.g. the cardiothoracic service.
- There may be greater resilience to bed pressures as stroke patients can be accommodated on more than one hospital site.
- This option maintains the specialist clinical team on site to care for non-stroke patients that require management by specialist stroke/neurology clinicians.
- Therapists with both stroke and cardiac skills would be available on site to support the management of highly complex in-patient cardiac/stroke patients.

For Option 2 a step down transport service is required between the HASU and the BRI ASU. This has been included in the financial analysis for this option.

The rationale for the conclusions drawn by the clinical team on the location of ASU care were predominantly based on the interdependencies of specialist stroke care with other specialised services and the need to maintain the specialist workforce on as few sites as possible. In line with national evidence, it was concluded that if

patients could be moved to where the specialist workforce and facilities were best provided (i.e. alongside other services with which stroke has a critical interdependency – see chapter 9) they would receive an increased quality of care. The need to maintain specialised stroke clinicians available to the UHBW BRI site as a result of critical interdependencies with services there applies in both ASU options.

Options 3 and 4, which modelled an ASU on the Weston Hospital site, were not recommended for further consideration for the following reasons:

1. Spreading the specialist workforce across more sites than necessary will not lead to an improvement in quality of care, as required in the case for change (Chapter 4).
2. Weston Hospital is distinct from the BRI because the vast majority of patients that experience a stroke within Weston Hospital can be safely transferred for specialist treatment – Weston Hospital does not have other specialised services that are only provided on that site. Therefore, patients in Weston Hospital do not have other comorbidities that can *only* be treated within Weston Hospital which precludes them from being moved to receive the highest quality stroke care.
3. The only patients that may not be transferred to the HASU from Weston Hospital would be those with frailty for whom the risk of transfer outweighed the benefit. In these situations, immediate care and treatment will be sought remotely with any specialist medical support available daily through the onsite TIA clinic provision. Ongoing care needs would be supported through co-location of the sub-acute rehabilitation unit on the Weston Hospital site.
4. There are no critical interdependencies with other Weston Hospital specialities that require maintenance of a specialist *acute* workforce for stroke for immediate treatment and care provision that could not be provided remotely.

In order to enable the people of North Somerset access to specialist stroke care, delivered in line with national guidance and best practice, completion of the acute care phase is recommended in Southmead Hospital under option 1, and in the BRI under option 2. Weston Hospital will continue to play a critical role in the provision of sub-acute stroke care for its population and, under the proposals, patients would be repatriated to Weston Hospital, or home with support from the new Integrated Community Stroke Service (see Chapter 10), as soon as they were medically fit for discharge. This will ensure that the very best clinical care is provided equitably to all BNSSG residents but that local care provision is in place as early in the pathway as possible and long remote hospital stays are avoided for North Somerset residents – patients and carers.

7.4 Community inpatient stroke sub-acute rehabilitation unit (SSARU) evaluation

A meeting of clinicians from all stroke healthcare provider organisations was held on 26th February 2020 to evaluate the six SSARU location options within BNSSG. The discussion was facilitated by an experienced independent clinical chair, Prof. Andrew Cant, Chair of the North East Clinical Senate.

The six original options that were evaluated can be seen in Table 12 below.

Table 12 - Original options for SSARU evaluation

Option A	Option B	Option C	Option D	Option E	Option F
South Glos. location	South Bristol location	South Glos. location	South Glos. location	South Bristol location	South Glos. location
South Bristol location	Weston	South Bristol location	Weston		
		Weston			

The workshop was set up to take the clinical group through the evaluation process; the following activities were undertaken to support a successful evaluation:

- An evidence pack was developed to support the evaluation process
- BNSSG Integrated Community Stroke Service Bed based options paper, developed by Sirona, to look at the options for the sub-acute rehabilitation bed options with some initial thoughts about benefits and challenges included.
- A series of sub-acute rehab bed assumptions were confirmed to enable the evaluation to be completed. In addition to those agreed, the group further confirmed the additional assumption that there was an interdependency associated with moving rehab beds out of the Southmead hospital acute site to create the likely HASU/ASU capacity.

7.4.1 Community inpatient stroke sub-acute rehabilitation unit (SSARU) evaluation outcomes

There was immediate consensus from the clinical group that a community inpatient rehab facility must be available at the Weston Hospital site for the North Somerset population. The rationale for this was based on the demographic of that population, the distance to nearest unit and the importance of having support from relatives and friends in the sub-acute phase of care. Similar rationale was felt to be applicable for residents of South Gloucestershire, although the distance to Bristol was not felt to be as prohibitive and the population risk factors are not as marked in that area.

The consensus conclusion regarding Weston Hospital at the beginning of the workshop led to three of the six options being eliminated at the outset of the evaluation process. The following options were therefore systematically evaluated by the clinical group:

Table 13 - Refined options for SSARU evaluation

Option A	Option B	Option C	Option D	Option E	Option F
South-Glos. location	Bristol location	South Glos. location	South Glos. location	South Bristol location	South-Glos. location
South Bristol location	Weston	Bristol location	Weston		
		Weston			

Through the objective assessment of the agreed individual evaluation criteria “Option C: sub-acute rehab beds in each of the three local authorities”, emerged as the strongest clinical model. **Option C became variation “a”, later in the clinical design process – see below.**

The consensus conclusion in favour of Option C/variation “a” was largely based on the following observations:

- Local access at the rehab stage is essential and equity of access to rehab provision across BNSSG was strongly desired.
- Importance of the interface with carers and families, in particular that it will disadvantage the North Somerset population if there isn’t a bedded rehab option in that area.
- Importance of the consideration of rurality, distance / travel times
- Population demographics, particularly referenced to the older population in North Somerset and South Gloucestershire and the deprivation and high risk factors associated with the North Somerset and South Bristol areas.
- Social care alignment for each local authority region and improved ease of discharge.

It should be noted that the population risk factors and geography of the area precluded the consideration of a single SSARU model at this stage as it was felt by the clinicians involved in the clinical evaluation process (and supported by the Stroke Programme Board) that the North Somerset population required a SSARU to be provided in the Weston area. Weston Hospital site was also chosen as a SSARU location in order to help improve health inequalities (e.g. greater deprivation and risk factors associated with stroke) as identified in the Equality Impact Assessment (Appendix 6) and through the population health management information presented in Chapter 6.

Because Weston is situated in the very South of the BNSSG area, it was agreed that a single SSARU in this location would be too remote from the HASU and too far for South Gloucestershire residents to travel. It was therefore determined that a second

SSARU would be required. It should be noted that variation “c”, a single SSARU option, was reconsidered later in the programme due to challenges identified in delivery of a consolidated workforce over multiple sites (see Section 7.5 below).

As a result of this, Options A, E and F, which either propose a single SSARU model or do not include a SSARU based at Weston Hospital, were not considered to be feasible and therefore were not recommended for further consideration as a result of the clinical evaluation.

Options B, C and D for SSARUs went on to be considered in greater detail by the BNSSG Stroke Programme alongside Options 1 and 2 for HASU and ASU care. These were renamed as *variations* of Options 1 and 2:

- SSARU Option C is considered under **variation “a”** and
- SSARU Options B and D are considered under **variation “b”**.
- The single SSARU option was also brought back into consideration as **variation “c”**; the rationale for this is explained in Section 7.5 below.

7.5 Workforce, value for money, patient flow and population health and access considerations

The clinical evaluation process for the BNSSG Stroke Programme provides the backbone of the clinical model development but there are important further considerations to take into account when planning significant service redesign. The workforce required to operate the service, the cost of this, the impact that different capacity configurations have on patient flow, population health, access considerations and quality of care are important aspects of the new clinical model that need to be taken into account.

With respect to this, there are key differences between Option 1 and Option 2, and between variations “a”, “b”, and “c” (operating 3, 2 and 1 SSARUs), which have been drawn out of detailed workforce and activity modelling work and set against known features of population health in the BNSSG area. Figure 23 provides an overview of the variations that have been considered by the programme and the differences between these variations are presented below.

Figure 23 - Variations of the clinical model on which detailed workforce analysis has been completed

Option 1a			Option 2a		
Hyper Acute Stroke Unit at Southmead Hospital			Hyper Acute Stroke Unit at Southmead Hospital		
Acute Stroke Unit at Southmead Hospital			Acute Stroke Unit at Southmead Hospital	Acute Stroke Unit at BRI	
Sub-Acute Rehab Unit in Bristol	Sub-Acute Rehab Unit in SG	Sub-Acute Rehab Unit in NS	Sub-Acute Rehab Unit in Bristol	Sub-Acute Rehab Unit in SG	Sub-Acute Rehab Unit in NS
Option 1b			Option 2b		
Hyper Acute Stroke Unit at Southmead Hospital			Hyper Acute Stroke Unit at Southmead Hospital		
Acute Stroke Unit at Southmead Hospital			Acute Stroke Unit at Southmead Hospital	Acute Stroke Unit at BRI	
Sub-Acute Rehab Unit		Sub-Acute Rehab Unit	Sub-Acute Rehab Unit	Sub-Acute Rehab Unit	
Option 1c			Option 2c		
Hyper Acute Stroke Unit at Southmead Hospital			Hyper Acute Stroke Unit at Southmead Hospital		
Acute Stroke Unit at Southmead Hospital			Acute Stroke Unit at Southmead Hospital	Acute Stroke Unit at BRI	
Stroke Sub-Acute Rehab Unit			Stroke Sub-Acute Rehab Unit		

7.5.1 Workforce and value for money

Workforce requirements associated with the clinical model are particularly pertinent as some specialist staff groups (namely medical and nursing staff) associated with stroke are in short supply nationally.

The difference between Options 1 and 2 and between operating variations “a”, “b”, and “c” (operating 3, 2 and 1 SSARUs) has been considered carefully with regard to the workforce required to safely operate the clinical model over multiple locations. The detail of this analysis is presented in Chapter 11 and a summary of the difference in staffing numbers (displayed as “whole time equivalents (WTE) and cost) between each of the SSARU variations can be seen in Table 14 below.

Table 14 - Comparison of baseline and future state whole time equivalents (WTE) associated with the stroke clinical model

	3 units		2 units		1 unit		Movement (3 to 2 units)		Movement (2 to 1 unit)	
	WTE	£'000	WTE	£'000	WTE	£'000	WTE	£'000	WTE	£'000
Pay costs	126.0	£5,980	103.3	£4,917	100.7	£4,816	-22.7	-£1,063	-2.6	-£101
Non-pay, Infrastructure & estates		£2,887		£2,727		£2,712		-£159		-£15
Total	126.0	£8,867	103.3	£7,644	100.7	£7,528	-22.7	-£1,223	-2.6	-£117
Cost per Bed		£578		£499		£491		-£80		-£8

It can be seen that a more centralised service model utilises lower numbers of specialised staff to provide the same outcomes. There is a marked difference in staff numbers between operating 3 and 2 SSARUs and a less marked difference between 2 and 1 SSARUS.

7.5.2 Patient Flow

“Patient flow” refers to the movement of patients along the patient pathway – from attendance of the paramedic, presentation at hospital, through to admission to the HASU, step down to the ASU and discharge to SSARU or home based rehabilitation care and “life after stroke”. Patient flow is important to understand because any blockages in the progression of care will lead to queues forming further “upstream”. In an acute clinical service, such as stroke, queues can lead to congestion at the beginning of the patient pathway and risk the most acutely unwell patients being unable to access the specialist care that they need.

Good capacity planning underpins patient flow and having the right capacity at each stage of the pathway helps to avoid queues. The capacity planning work for the proposed changes to stroke care in BNSSG has been done in close liaison with all service providers, including SWASFT, and using recognised, validated, data sources. The detailed capacity analysis is presented in Chapter 11 and, to support this, a simulation model has been developed to evaluate the variation (peaks and troughs) that the service is likely to experience and what this will mean for patient flow across the course of a year. The detail is included as Appendix 10.

The findings from this ‘stochastic’ modelling work demonstrate that blockages are more likely to occur with a high number of small units, unless additional flexibility (more beds) are provided at peak times. For example, when the required 42 SSARU beds (see Section 11.2 for details on capacity planning) are split between 3 smaller SSARUs (distributed as an 18 bedded unit and two 12 bedded units), 15 beds of flexibility are required to achieve the same patient flow as 10 beds of flexibility within

the 2 SSARU model, which distributes the 42 beds evenly between two units. As community beds continue to be a pressure within the BNSSG health system, consideration of a smaller number of units is important.

Further to this, the “test and learn” development using beds at Henderson Rehabilitation Unit in Thornbury, have provided some rich learning for the system in the design of the new clinical model. The four beds at the Henderson Rehabilitation Unit that have been used to help facilitate earlier discharge of stroke patients have helped reduce the length of stay that individuals have experienced in Southmead Hospital, particularly, as a result of the community care that this unit and its staff have provided. However, having a small number of beds ring-fenced for stroke on Henderson rehab unit has meant that it has been difficult to maintain staff competencies in stroke care, whilst simultaneously trying to ensure that the wider unit was functioning well for more general medical and rehabilitation patients, who had different needs.

Nursing staff on Henderson unit provided feedback that regular access to a consultant or specialist nurse would improve their confidence in managing stroke and providing the best care. They also noted that a lack of psychology provision, for younger stroke survivors in particular, was a gap in provision. Therapists reported that they could benefit from more stroke specific therapy resources and equipment but was difficult to justify due to the needs of stroke patients being different to the majority of their patients, who had not experienced a stroke. Other premises and facility challenges were also identified.

In the future model, larger units and a flexible workforce would ensure that staff would be able to spend the majority of their time working with people with stroke. Larger facilities would also mean that specialist equipment and resources appropriate for stroke care would be available and there will be stroke specialists from all disciplines as part of the core rehabilitation team. Consultant ward rounds, stroke specialist Advanced Care Practitioners and Psychologists would be able to provide the support that nurses felt was lacking in the test and learn beds. This will allow a real focus on stroke care in staff development and the facilities available to maximise stroke rehab and activity, which in turn, will help people return home swiftly from SSARU care with the right support and expertise around them.

7.5.3 Population health

Knowledge of population health, and experience associated with health inequalities and the way in which people access services, were considered within the clinical evaluation process as part of the evaluation process. Clinicians recognised features specific to the Weston area, such as age and deprivation, and travel limitations that people experience when they are asked to go to other locations to access services (for example, weekend TIA services provided from Southmead Hospital are not well accessed by people from Weston, despite referrals being made).

As the 3, 2 and 1 SSARU variations were considered, assumptions about population health were re-visited in order to ensure that the population health management information (which is drawn out of “system wide dataset”) supported the clinical

recommendation that a SSARU should be situated in the South of the BNSSG area, at the Weston Hospital site.

The population health information is presented in detail in Section 6.2 and there are a number of ways that the data can be considered. For example, by risk factors associated with stroke, by incidence of stroke and by level of deprivation, which often indicates how likely people are able to travel to access services. It can be seen from the maps provided in Section 6.2 that, whilst the highest number of strokes and TIAs are seen in and around the centre of the Bristol, there is a concentration of strokes and TIAs seen in the Weston area, to the far South of the BNSSG area (Figure 14). This is also the case when the stroke risk is reviewed and North Somerset has a number of areas highlighted where people are at higher risk of stroke (Figure 16). Deprivation is also high in the Weston area, as seen on Figure 15.

Clearly, there is also significant need in the wider Bristol area and the conclusion that two SSARUs should be included in the consultation proposals is also supported by population health management data. A unit placed at the Weston Hospital site and a unit located to in the centre-north of the BNSSG area would most optimise access for those that are most likely to be using stroke rehabilitation services.

7.5.4 NHSEI South West Clinical Senate advice

The NHSEI South West Clinical Senate scrutinised the proposals for change at their clinical review panel (CRP) meeting on 27th January 2021. This is an important part of the NHSEI assurance process (see Chapter 14). The variations on Options 1 & 2 were presented to the CRP through an earlier draft of the PCBC and some additional supporting information.

The CRP gave assurance to the clinical model proposed. The full report can be seen as Appendix 15. The CRP concluded that:

“Overall the BNSSG proposals for stroke care were considered broadly well thought through, well presented and motivated by a clearly articulated case for change. The Clinical Review Panel (CRP) concluded that it could offer assurance that the proposed clinical models presented are supported by a clinical evidence base and are ready to proceed to public consultation”

The CRP also gave a number of observations that have been addressed within this Final PCBC document. Of particular note to the clinical design process and the proposals that are now put forward for consultation, the CRP recommended that the BNSSG Stroke Programme consider naming a preferred option. They recommended that this could be determined by naming the option that:

- Minimised the number of handovers in care for patients
- Most consolidated the workforce
- Improved the affordability of the proposals

The CRP concluded that this would make the preferred option, Option 1b.

7.6 Conclusions of the clinical design process

It can be seen that the BNSSG Stroke Programme has carefully considered the full range of options available for the future configuration of stroke care. Governance of the programme through the Healthier Together ICS has enabled the clinical design process to be robustly examined and tested at all stages by the Clinical Cabinet, the System Directors of Finance and the Healthier Together Executive Group (see Chapter 14 and Appendix 2 for more details of the governance structure associated with the programme) and engagement with patients, carers, staff and other key stakeholders, such as primary care clinicians, has helped guide the design process.

The BNSSG Stroke Programme Board, supported by the Acute Care Collaboration recommended that Options 1 and 2 progress to consultation with the public and this was supported on 5th February 2021 by the Healthier Together Executive Group.

A recommendation on the number of SSARUs was also put forward by the Acute Care Collaboration to the same meeting of the Healthier Together Executive Group. This recognised the advice of the SW Clinical Senate, and considered the detailed workforce and financial analysis undertaken against each of the SSARU variations.

SSARU variation “b” was assessed by Healthier Together system partners as bringing the most benefits to patient care because it offered the greatest consolidation of the specialist stroke workforce (22.7 less specialist staff are needed to operate 2 SSARUs in comparison to 3 SSARUs) and improved affordability, whilst still ensuring good access for patients and families/carers across the BNSSG geography.

As seen in Table 14, the workforce efficiency gains seen between variation “a” and “b” are not seen again between variation “b” and “c”; this led to variation “c” being removed from consideration because a single SSARU would not be accessible to the population of BNSSG and would fail to address equality impacts identified in the EIA (Appendix 6). Furthermore, accommodating all SSARU beds in one location using existing/planned NHS estate was not deemed to be deliverable.

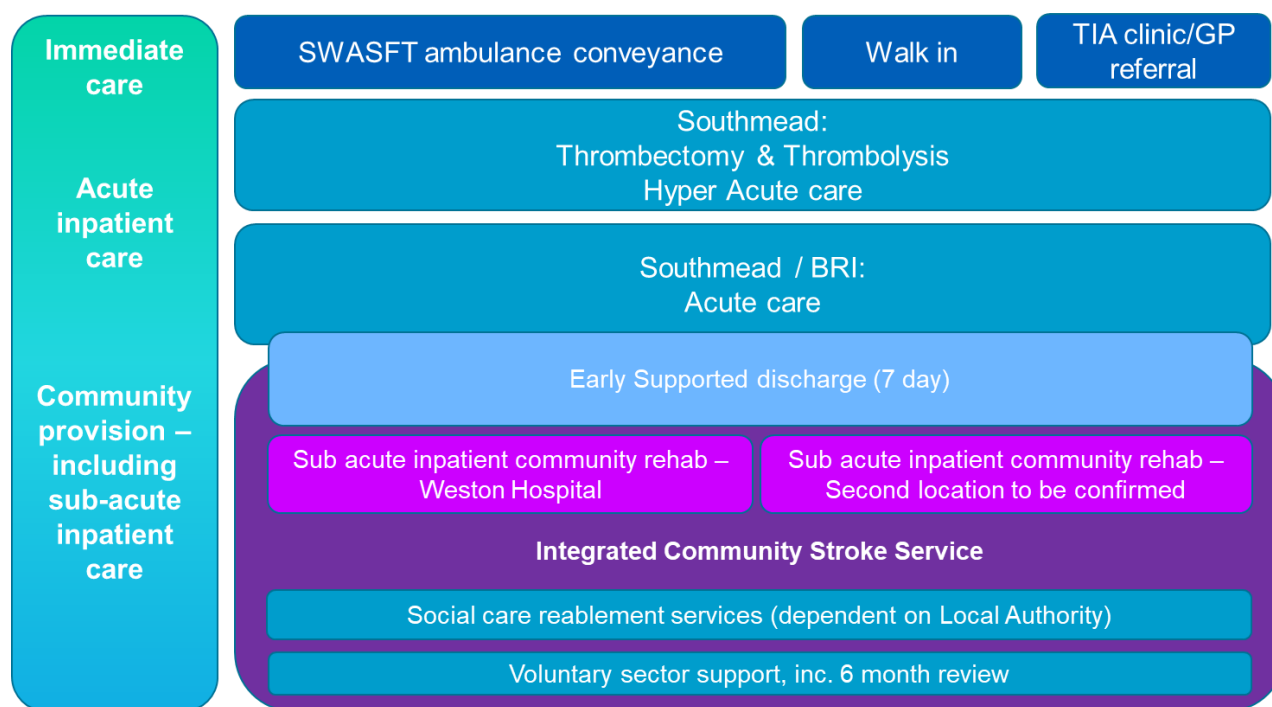
Variation “a” was also removed from consideration because it did not sufficiently consolidate the workforce and there was a risk that quality of care could be impacted because it was not possible to staff a high number of small units. As a result of the higher number of staff required, the cost of variation “a” was also deemed prohibitive.

Chapter 8 provides the detail of the proposals that are put forward for consultation with the public as a result of the clinical design process.

8 Proposals for consultation

There are compelling reasons why reconfiguration of specialised stroke services is required in the BNSSG area, as evidenced in Chapter 4. Engagement and co-design work with people with lived experience of the current stroke services, in conjunction with national guidance, has led to the development of a new clinical service model. An overview of this can be seen in Figure 24.

Figure 24 - Proposed new service model for stroke in BNSSG



The proposed changes to **immediate and acute inpatient care** will impact where people receive their initial treatment and where acute hospital care is delivered within BNSSG. Therefore, in line with NHSEI's assurance requirements for significant service change⁵⁷, the following proposals are recommended for public consultation so that the BNSSG Stroke Programme can listen and act on feedback from those that may be impacted by the services changes. This will support the shared aspiration to make stroke services in BNSSG the very best that they can be for the population that they serve.

It should be noted that the consultation proposals need to be read in conjunction with chapter 10, as the most significant changes to long term care provision for people following a stroke are seen through the implementation of a new Integrated Community Stroke Service (ICSS).

⁵⁷ <https://www.england.nhs.uk/wp-content/uploads/2018/03/planning-assuring-delivering-service-change-v6-1.pdf>

8.1 Immediate treatment

It is proposed that all patients with a possible stroke diagnosis are directed to Southmead Hospital for immediate specialist stroke care.

This proposal is in line with the new National Stroke Service Model (Appendix 1) and would establish Southmead Hospital as a “Comprehensive Stroke Centre”, providing hyper acute, acute and inpatient rehabilitation including thrombectomy and neurosurgery.

If this proposal proceeds to implementation it would mean that:

- South West Ambulance paramedic crews that attend a patient with a possible stroke diagnosis within the past 24 hours convey them to the HASU at Southmead Hospital for immediate care and treatment, regardless of where they live in the BNSSG area (the only exception to this are patients in the Sedgemoor area, whose closest hospital in place of Weston Hospital is Musgrove Park Hospital in Taunton). This is what currently happens for patients who have a stroke after 11pm and before 8am in the BRI catchment area and for people in the Weston Hospital catchment area who have a stroke outside of 9am-5pm Monday to Friday.
- Anyone that experiences a stroke as an inpatient within the BRI or Weston Hospital and can be safely conveyed (i.e. does not have any other specialist care needs that require treatment at the original site) is transferred via a blue light ambulance to the HASU at Southmead Hospital.
- Anyone that walks into an emergency department in the BRI or Weston Hospital and is diagnosed with a possible stroke is transferred via a blue light ambulance to the HASU at Southmead Hospital.
- Anyone identified as needing further investigations following review in a TIA clinic are directed to the HASU at Southmead Hospital for specialist review and possible intervention.
- Anyone identified in primary care as having a possible stroke diagnosis would be either admitted directly to the HASU or assessed in an ambulatory setting (SDEC/TIA clinic)
- Emergency Departments within Weston Hospital and the BRI will only receive those patients not identified as a stroke pre-hospital. Management and/or transfer of these patients will be required from those sites to the HASU.

Detailed modelling of the impact on ambulance response times and travel times has been undertaken as part of the BNSSG stroke programme to ensure that patients and their families are not disadvantaged as a result of the proposals for change. The full analysis can be seen in Appendix 8 and the travel time results are summarised in Figure 25. Patients in the Weston Hospital catchment area who are the furthest away are already conveyed to Southmead Hospital outside of daytime working hours (9am-5pm) Monday to Friday.

Because 100% of patients can reach the HASU within 45 minutes under a blue light conveyance there is no detrimental impact on patient outcomes expected as a result of the changes proposed to immediate care. Any impact on delaying time to being assessed for acute treatments such as thrombolysis can be mitigated by improvements in the speed and consistency of delivery of the acute service once patients arrive in hospital.

Figure 25 - Proportion of BNSSG residents within time travel bands for blue light travel to the Southmead Hospital HASU

Scenario	Proportion of residents within time travel bands			
	Proportion 0 - 10 mins	Proportion 0 - 20 minutes	Proportion 0 - 30 minutes	Proportion 0 - 45 minutes
Southmead HASU Blue Light Travel	5%	28%	71%	100%

South West Ambulance Service Foundation Trust (SWASFT) have determined the resourcing that they require so as to ensure that there is not a detrimental impact on their responsiveness performance as a result of the changes proposed. This has been assessed by SWASFT as 36 hours of a dual crewed ambulance per week. The cost of providing this additional ambulance time is included in the full financial analysis, which is detailed in Chapter 11.

The impact on the A&E Departments as a result of the change in patient flows has been assessed by SWASFT for those patients redirected, and also those patients transferred following an inpatient stroke in another hospital setting. The expected movement of patients between hospitals can be seen in Chapter 11. All diagnostic and A&E Department staffing requirements have been assessed by the hospitals affected by the changes and, where applicable, costs associated have been included in the full financial analysis (Chapter 11).

8.2 Changes in hospital provision

It is proposed that a single HASU with specialist thrombolysis and thrombectomy services, allied to neurology and neurosurgical services, will be introduced at Southmead Hospital, North Bristol Trust, (NBT). Two options for ASU care are put forward for consideration:

- **Option 1:** proposes that a single Acute Stroke Unit (ASU) is established that would be, co-located with the HASU based at Southmead Hospital to provide a fully centralised specialist acute stroke service for BNSSG. Stroke care on other hospital sites would be delivered by a combination of onsite and remote specialist stroke support.
- **Option 2:** proposes that two ASUs are established, one would be co-located with the HASU at Southmead Hospital (as in Option 1) and one would be based at the Bristol Royal Infirmary (BRI). This additional ASU would also provide a physical base from which to support inpatients under other specialities (e.g. Bristol Heart Institute) who cannot be transferred to Southmead Hospital for specialist stroke care. Both ASU's would be supported by the single HASU proposed at Southmead Hospital.

Both the options proposed are in line with the new National Stroke Service Model (Appendix 1).

Under Option 1 (and using the new terminology introduced in the National Stroke Service Model), Southmead Hospital would be established as a single “Comprehensive Stroke Centre”, providing hyper acute, acute and inpatient rehabilitation, including thrombectomy and neurosurgery. Inpatient stroke care would only be delivered in the BRI to those patients that could not be transferred to Southmead Hospital. Weston Hospital, alongside another community setting, would be a “Stroke Recovery Unit”, providing inpatient sub-acute rehabilitation (SSARU) care only – see the proposals for sub-acute inpatient care in Section 8.3 below.

Under Option 2 (and using the new terminology introduced in the National Stroke Service Model), Southmead Hospital would be a “Comprehensive Stroke Centre” and the BRI would be a “Stroke Recovery Unit”, offering acute inpatient rehabilitation as an ASU. Weston Hospital site, alongside another community setting, would also be a “Stroke Recovery Unit”, but provide sub-acute inpatient rehabilitation (SSARU) care only, as in Option 1 – see the proposals for sub-acute inpatient care in Section 8.3 below.

If this proposal proceeds to implementation it would mean that:

- Anyone from the BNSSG area that has experienced a stroke and needs inpatient hospital care following immediate treatment would have a length of stay at Southmead Hospital on the HASU (average length of stay = 3.5 days).
- **Under option 1**, anyone needing ongoing inpatient treatment beyond the hyper-acute phase would “step down” to the single ASU co-adjacent to the HASU based at Southmead Hospital (average length of stay = 6 days).

- **Under option 2**, people from the NBT catchment area needing ongoing inpatient treatment beyond the hyper-acute phase would “step down” to the ASU co-adjacent to the HASU based at Southmead Hospital, people from the BRI and Weston Hospital catchment areas would “step down” to ASU care provided within the BRI.
- **Under option 1**, anyone needing specialist stroke support that cannot be transferred to the single HASU and ASU at Southmead Hospital as a result of critical interdependencies with other BRI specialities would be cared for by an onsite medical and therapy team at the BRI.
- **Under option 2**, anyone needing specialist stroke support that cannot be transferred to the single HASU and ASU at Southmead Hospital as a result of critical interdependencies with other BRI specialities would be cared for by the BRI based stroke team.
- **Under both options**, if there are ongoing inpatient rehabilitation and/or care needs once a patient is medically fit for discharge, this would be provided in a stroke sub-acute rehabilitation unit (more detail on the Integrated Community Stroke Service is provided in Chapter 10).
- **Under both options**, Weston Hospital will continue to play a critical role in the provision of stroke care as a sub-acute rehab unit. Weston Hospital would have a regular medical presence from the BNSSG Stroke Service (providing twice weekly ward rounds and TIA clinics that could incorporate ward care if required) and on-site therapy and nursing support associated with a stroke sub-acute rehabilitation unit.

8.3 Inpatient sub-acute rehabilitation units (SSARUs)

It is proposed that inpatient sub-acute rehabilitation is moved from the acute hospital setting to the community.

Two SSARUs (variation “b”) are proposed:

- Weston Hospital site will be the location of one of sub-acute rehab units
- The location of the second sub-acute unit will be determined as part of the consultation process, taking into account population need and existing/planned NHS estate.
- Possible locations for the second sub-acute rehab unit are South Bristol Community Hospital or the Frenchay site (with interim arrangements)

This proposal is in line with the new National Stroke Service Model (Appendix 1).

If this proposal proceeds to implementation it would mean that:

- Everyone who would benefit from rehabilitation following a stroke will receive it; this will be provided outside of an acute hospital setting and in the location most suitable to meet that individual’s specific care needs as part of the ICSS (see Chapter 10).
- People who require a period of inpatient rehabilitation care following their acute treatment for stroke would be transferred from the ASU (at Southmead Hospital or at the BRI) to one of two SSARUs in the BNSSG area.

- One SSARU would be located at Weston Hospital and the other would be located in another existing/planned NHS facility, such as South Bristol Community Hospital or the Frenchay site (with interim arrangements).
- People would be cared for in the SSARU that was closest to their home.
- Close working relationships with the ICSS at home service (see Chapter 10), families and carers, and local social care services would ensure that people were supported home, or to a longer term place of residence, with the right support as early as possible.

8.4 Proposals for consultation

Options 1b and 2b are recommended for public consultation. In addition the following have been proposed by the Healthier Together system leaders:

- Weston Hospital will be the location of one of sub-acute rehab units
- The location of the second sub-acute unit will be determined as part of the consultation process, taking into account population need and existing/planned NHS estate
- Possible locations for the second sub-acute rehab unit are South Bristol Community Hospital or the Frenchay site (with interim arrangements)
- A 'preferred' option has been named by health system partners as Option 1b because this option reduces handovers in care for patients, most consolidates the workforce and is the most affordable

A summary of the two options for consultation can be seen in Figure 26 below:

Figure 26 - Options for consultation

Preferred Option			
Option 1b		Option 2b	
Hyper Acute Stroke Unit at Southmead Hospital		Hyper Acute Stroke Unit at Southmead Hospital	
Acute Stroke Unit at Southmead Hospital		Acute Stroke Unit at Southmead Hospital	Acute Stroke Unit at BRI
Sub-Acute Rehab Unit	Sub-Acute Rehab Unit	Sub-Acute Rehab Unit	Sub-Acute Rehab Unit

- Weston Hospital as a fixed point for one sub acute rehab unit
- The location of the second sub acute unit will be determined as part of the consultation process

The following figures provide three examples of patient pathways, under the proposed changes with the options and variations presented according to impact on the specific patient pathway (where variations are not included, they are not applicable to that patient pathway).

Figure 27 - North Somerset patient pathway under the current and future service configuration

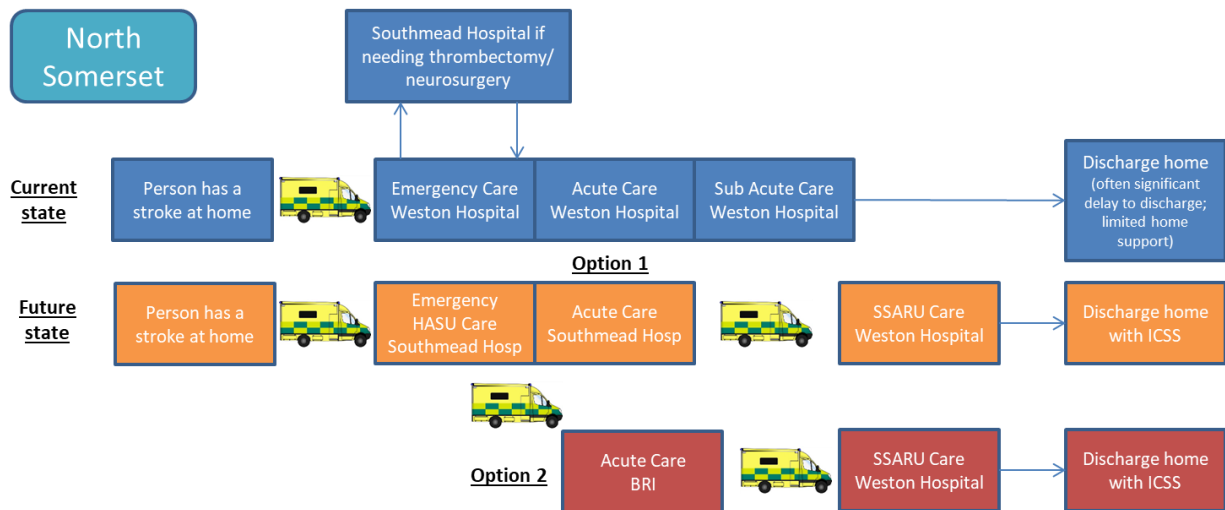


Figure 28 - Central Bristol patient pathway under the current and future service configuration

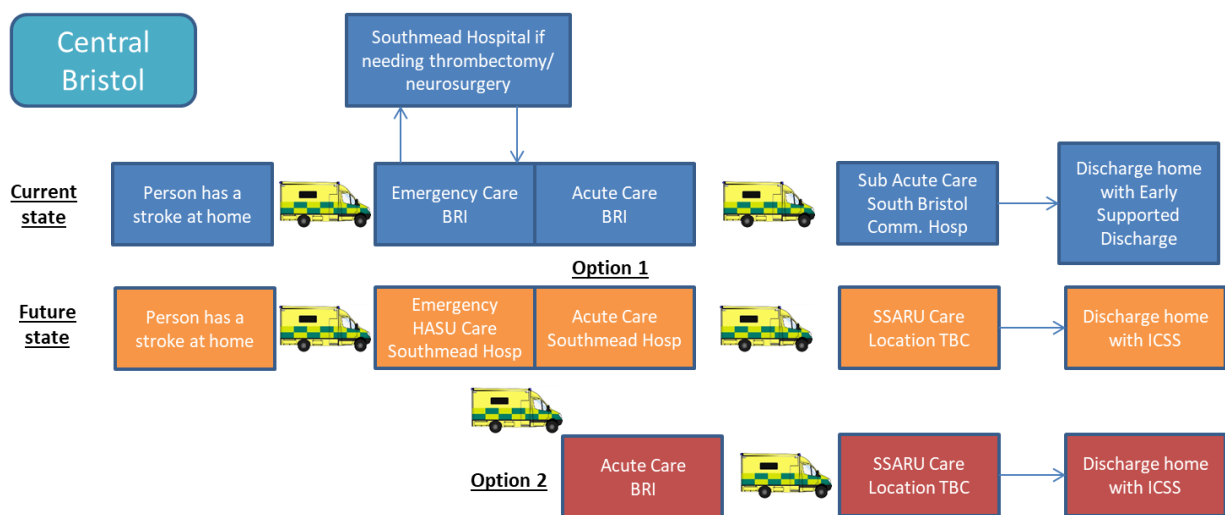
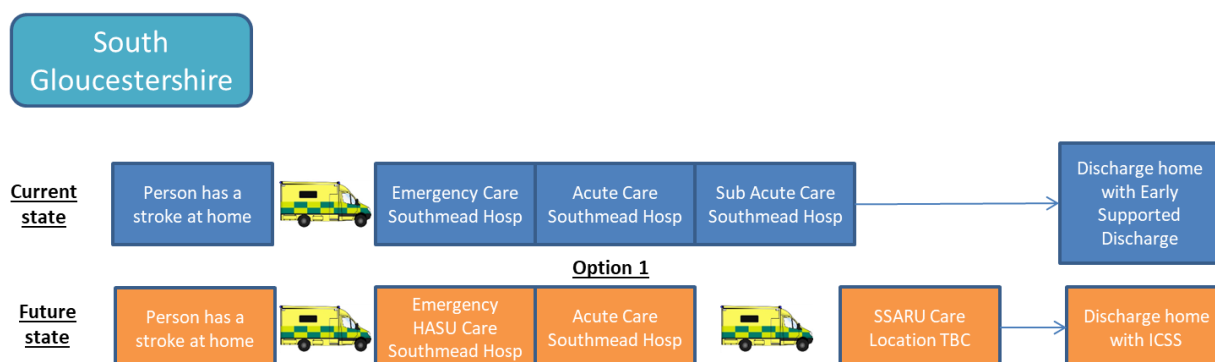


Figure 29 - South Gloucestershire patient pathway under the current and future service configuration



In summary, the things that the BNSSG Stroke Programme intends to consult with the general public are:

- What people think about the **having a Hyper Acute Stroke Unit** to support people from all parts of BNSSG immediately after having a stroke. This includes:
 - whether people **understand the reasons** that a change is needed
 - what people think the **benefits and challenges** might be
- What people think of **two options for ongoing stroke care in hospital** after the 'immediate' phase. The BNSSG Stroke Programme will seek to find out:
 - what people see as the benefits and challenges from having **one acute stroke unit** located as part of the Hyper Acute Stroke Unit (Southmead Hospital) versus having an acute stroke unit at **two locations** (one at Southmead Hospital and one ASU at the BRI)
 - whether people have a **preference** and why
 - whether people **understand the reasons** why it is proposed that there is one unit co-located as part of the Hyper Acute Stroke Unit
- **Where** services should be located for people who need to have **rehabilitation** in an inpatient facility. This includes:
 - whether people **understand** why two rather than three sub-acute rehabilitation units are proposed, and what they feel about that
 - what people think about having rehabilitation available at **Weston General Hospital**
 - **where** another rehabilitation unit should be located and why
 - what factors should be **prioritised when deciding** on a location

The public consultation will also invite any other feedback that people would like to provide about the approach that the BNSSG Stroke Programme is taking to redesigning stroke services, including the integrated community stroke service, though this is not a service reconfiguration that is part of the formal public consultation.

8.5 How the proposals for consultation respond to service user feedback

The key themes from the various phases of engagement activity (detailed in Chapter 5) have been reviewed to ensure that the proposals for change will respond positively to what stroke survivors and their families have said is important to them. A description of these themes, which have guided the clinical design process throughout, and the resultant actions and responses are presented below.

It should be noted that the vast majority of comments throughout the engagement process have focused on life after stroke/rehabilitation and community services, therefore, the ICSS detailed in Chapter 10 contributes significantly to how services will be improved. That said, the rich information provided by those with lived experiences has provided important reflection into the design of the acute services.

Centralisation of emergency treatment:

Despite the change in travel times that will be seen for some people as they are conveyed to a centralised hyper acute stroke site for emergency treatment, the feedback received demonstrates an understanding of the evidence base and logic for this. There was also strong feeling about equity of services across the region.

“I think one centre of excellence will command greater acknowledgement (and possibly win more targeted funding ?) than a split / dual facility - Service User with recent lived experience of stroke

***“Services can often involve a postcode lottery. ‘Where do you live?’ is often the first question [for those recovering]”
- Voluntary sector***

“The plan looks good in principle... I think having a central HASU will help to remove the ‘postcode lottery’ which appears to be the reality of the current mixed bag of approaches” - Service User with recent lived experience of stroke

Action:

The proposal for a single hyper-acute stroke unit at Southmead Hospital will ensure that people have access to the same life-changing interventions for stroke regardless of where in BNSSG they live.

Family and carers are also significantly affected:

Throughout every phase of engagement, comments were made about the need to consider the implication of new services on the key role that family members and carers play, particularly in the long term support of people with stroke.

“...carers who often do the bulk of the rehab and routinely get forgotten” – Partner of service user with recent stroke

***“When I was ready to leave, my home wasn’t ready and needed to be adapted.....It felt forced and rushed at the end” “Very little communication with family at time of discharge. I wasn’t told what time I would be leaving and my daughters needed to pick me up”.
– Service user in co-design group.***

“... because like it or not, the bulk of the care and rehab will still be provided by the family in the absence of the ICSS”. – Service user with recent experience of stroke

Action:

These comments have been at the heart of the design process particularly for the service improvement development of the integrated community stroke service (ICSS). Detailed planning has been done, and is ongoing, for how patients are prepared for discharge home as soon as is safe and appropriate, has been done with the consideration that family members and carers need to be involved in this process.

A model that supports rehabilitation delivery over 7 days:

There was unanimous agreement that delivery of rehabilitation over 7 days a week was important throughout all stages of the pathway.

[Would you not want a rest at the weekend?] “NO. You don’t have a rest in your life at the weekend do you?” -
Service User with recent lived experience of stroke

[ICSS will deliver rehabilitation over 7 days] “This is a welcome change but I suspect you are going to require more staff to ensure this.....currently far too many cancelled sessions and changed appointments because the team are too busy”. – Wife of a service user with stroke

“Brilliant rehab Monday to Friday but blank timetable on Saturday and Sunday.....Gyms were empty at the weekend. A wasted opportunity.....It would make a huge difference to moral and wellbeing and get people home quicker. All the patients I talked to thought it was a good idea” –
Service user co-design group comments

Action:

Staffing numbers for all members of the multi-disciplinary team, for all parts of the proposed new pathway, were calculated assuming delivery of rehabilitation over 7 days a week. There is ongoing focused discussion on the detail of staff rostering, particularly Allied health Professionals, to ensure optimal numbers of staff throughout the week to deliver all aspects of assessment and discharge planning, incorporated within the rehabilitation. This will ensure optimal flow through the pathway and discharge at the earliest appropriate opportunity so minimising the length of hospital stay.

8.6 Impact of the proposals on quality of care

The NICE quality standard for stroke specifies that services should be commissioned from and coordinated across all relevant agencies encompassing the whole stroke care pathway. A person-centred, integrated approach to providing services is fundamental to delivering high-quality care to adults who have a stroke.⁵⁸

The Health and Social Care Act (2012) sets out a clear expectation that the care system should consider NICE quality standards in planning and delivering services,

⁵⁸ <https://www.nice.org.uk/guidance/QS2/chapter/introduction>

as part of a general duty to secure continuous improvement in quality. Chapter 12 details how the proposals improve compliance with key national standards and address the case for change, described in Chapter 3. The Quality Impact Assessment (QIA) document, which is provided in full in Appendix 9, and is summarised here, gives an overview of the current state for BNSSG stroke services and the quality impact associated with the proposed changes.

In particular, the QIA reviews the three key domains of:

- Patient safety (doing no harm to patients):
 - The proposals for change establish earlier access to the thrombectomy centre for the entire population of BNSSG.
 - They also ensure that stroke treatment is centralised in the facility most well equipped to deal with neurological and neurosurgical complications associated with stroke care, thus improving the overall safety of the service for patients.
 - All patients from across the BNSSG area can reach Southmead Hospital within 45 minutes by blue-light ambulance.
 - Improvements in the emergency response within Southmead Hospital, which will operate a larger and more effective service, will also mitigate the longer transfer time that some patients will experience as a result of the changes.
 - Access to hyper-acute specialised care for stroke has been well documented as improving patient safety and outcomes.
 - Support for neurology patients remaining in the BRI and Weston Hospital must be included in both options.

- Patient experience (care should be characterised by compassion, dignity and respect)
 - The proposals will involve increased travel time for patients who need emergency treatment during certain hours/days. This introduces some cost to the families of those patients taken to other hospitals, in visiting them, and they are also likely to require extra time to visit them.
 - In the 3 SSARU model (variation “a”) the SSARU beds in each of the three local authorities would in part mitigate the potential increased travel time for the hyper acute and acute length of stay as patients needing ongoing inpatient care will have the longest part of their hospital stay in a facility close to home.
 - Improved home care will also mitigate the longer journey times that some may experience to visit friends/relatives, as the hospital length of stay is reduced and replaced by well-supported home-based rehabilitation wherever possible.

- Effectiveness of care (to be measured using survival rates, complication rates, measures of clinical improvement, patient-reported outcome measures and patient-reported experience measures)
 - National best practice guidance has been used throughout the process for developing the clinical model across BNSSG.
 - Evidence suggests that concentrating these services into fewer, larger centres of excellence, can improve outcomes and save lives.

- Designating a HASU at Southmead hospital where guidelines can be sustainably met will improve the effectiveness of care and clinical outcomes.

The quality impact assessment highlights that centralising stroke services across BNSSG will enable more patients to access high quality stroke care and receive life changing interventions. A single, seamless pathway will enable an equitable service across the region and improve compliance of the BNSSG service with all aspects of national stroke guidelines. This is coupled with retaining care as close to home as possible through improved home-based rehabilitation care and localised sub-acute rehabilitation. This will have patient experience (and clinical) benefits as a result of people being cared for in the longer term close to family and friends.

8.7 Impact of the proposals on equality

A full Equality Impact Assessment (EIA) has been developed on the proposals for change, working with people with lived experience and representatives from patient interest groups. The EIA gives insight into the local population and their health needs, and what the BNSSG Stroke Programme has learnt through its engagement activities so far.

The Equality Act (2010) makes it unlawful to directly or indirectly discriminate against people with protected characteristics. The EIA, which is included as Appendix 6, considers in detail the 9 protected characteristics and also puts particular focus on:

- Identifying groups more affected by stroke and in particular, what it is about these groups that may make it more likely that they will have a stroke. Particular attention is given to protected characteristics and consideration of health inequalities across BNSSG, in line with the Public Sector Equality Duty (PSED).
- Considering equity of access to all aspects of the stroke pathway: identifying barriers that make it harder for specific groups to access services, reducing their risk of stroke and recovering from it more quickly.
- Identifying areas for consideration to address these barriers when designing the future service model.

Overall, the provision of access to a single centralised HASU enhances equity of access to stroke care across BNSSG. This change in provision means that people can access the very best care and treatment regardless of where they live and the time of day that their stroke occurs. Early intervention and treatment can prevent long term disability and the new service model will ensure that more people benefit from highly specialised interventions (such as thrombectomy) that Southmead Hospital provides.

Coupled with this, the BNSSG Stroke Programme has heard from individuals that people want to be supported to return to home (or close to home) as quickly as possible. The enhancements to the community provision detailed in Chapter 10 will enable this and ensure that people affected by a stroke have a short length of stay in hospital and are discharged home, or to a locally based SSARU, with the right support as early as possible in the care pathway. This will be supported by enhanced

use of technology to make interventions and treatment more accessible remotely. It will also help ensure that specialised stroke support can be accessed by local stroke clinicians as and when needed, so that they can provide the best care possible for patients, wherever they are working from (including in peoples' home).

9 Clinical interdependencies associated with the consultation proposals

The hyper acute and acute stroke unit(s) will provide high quality emergency stroke care 24 hours a day, 7 days per week. To operate effectively, these dedicated units will need to be supported by other services (HASU and ASU clinicians also provide support to these (and other) co-adjacent services). This chapter details the clinical interdependencies that exist within the proposed clinical service model and any assumptions, including where appropriate the inclusion of financial assumptions, that have been made within this Pre-Consultation Business Case.

9.1 Interdependencies

9.1.1 A&E / ED, including thrombolysis delivery

Centralising the hyper acute stroke unit will increase the number of ambulance arrivals to the Southmead Hospital A&E department. An additional 23 patients per week are anticipated to arrive at Southmead Hospital as a result of these proposals (this is on a backdrop of 2018/19 A&E attendance activity of circa 1800 patients per week).

In part, this will be mitigated through increased specialist stroke 24/7 staffing cover and through the use of direct admission pathways to the relevant stroke ward, for specialist intervention and treatment. The on-site 24/7 stroke team will ensure that there is opportunity to assess, treat and admit patients rapidly to the HASU from A&E. An additional cost of circa £300K has been included in the financial assessment in order to ensure that staffing can be uplifted to cater for the additional stroke patients at Southmead Hospital. In the BRI and Weston Hospital no assumptions of cost removal from the A&E departments have been made.

The thrombolysis pathway has been carefully reviewed in order to ensure a rapid and high quality service offer can be achieved in the future state. The most critical aspect of the future state is that the vast majority of stroke patients in BNSSG would be conveyed to Southmead Hospital, where an enhanced clinical team, highly specialised in stroke care, will respond rapidly to assess a patients' suitability for thrombolysis or thrombectomy and be able to administer the preferred treatment very quickly.

Thrombolysis is a high risk drug and the infusion, and the hour following infusion, requires careful clinical monitoring by clinicians trained in thrombolysis delivery and care. The number of patients expected to be suitable for thrombolysis outside of the HASU in the future state is low. Using the same data as used for the SWASFT modelling, there would be around 17 patients per year at the BRI and 5-6 per year in Weston who were not immediately conveyed to the HASU and who would benefit from thrombolysis delivered outside of the HASU setting. A clinical pathway is required for these patients that enables thrombolysis to be delivered as rapidly as possible. This has been carefully considered by the Clinical Design and Delivery Group and the risk associated with delivering thrombolysis to patients outside of the HASU very infrequently, considered against the time benefits of delivering thrombolysis locally.

Clinical support, provided via “telestroke” (remote stroke assessment and treatment), from the HASU will enable this life saving treatment to be delivered in hospital settings across BNSSG. A safe protocol for the delivery of thrombolysis treatment to a stroke patient who arrives at the BRI or Weston Hospital will be established under the proposals for change. Decision making is likely to include a rapid clinical risk assessment conducted between a senior ED clinician and a senior member of the HASU team in order to determine whether commencing treatment locally or arranging rapid transfer will be most effective for that individual. This rapid clinical risk assessment will ensure that thrombolysis is commenced as rapidly as possible, whatever the location of the patient. When it is determined that thrombolysis should be commenced outside of the HASU, this will be supported remotely by HASU clinicians, with rapid transfer to the HASU as soon as is feasible.

9.1.2 Diagnostics

Specialist imaging services are required to determine if a patient has had a stroke and help determine the appropriate onward treatment required. The South East Coast Clinical Senate⁵⁹ reference the challenges associated with delivering 24hr access to certain imaging services across a wider region and describe the need for a networked solution for rapid or immediate access. There are constraints linked to the availability of radiography and radiology staff including urgent reporting.

Centralising immediate care in one location supports access to essential diagnostics. Overall the costs of imaging and diagnostics are already included within baseline provisions; no hospital is providing sub-standard imaging at present. The baseline cost assessment for diagnostics is therefore assumed for the future state proposals (before application of growth assumptions). The workload and therefore cost impact will transfer from Weston Hospital and the BRI. Detailed assessment of the impact on the different diagnostic modalities used in stroke care across BNSSG is available and work is underway to determine the specific impacts and configuration of imaging associated with emergency care and TIA provision in all hospital sites.

Increases in imaging demand at NBT will be mitigated to some extent by proposed changes to TIA clinic services (all TIA clinic referrals from GPs, SWAST and Bristol Eye Hospital will attend TIA clinic at UHBW) and immediate specialist assessment of patients with suspected stroke with triage to the most appropriate pathway e.g. SDEC, reducing the number of patients imaged multiple times.

9.1.3 Stroke “Mimics”

A ‘stroke mimic’ is any condition which presents with stroke-like symptoms, but is actually a different condition.⁶⁰ Centralising stroke services will mean an increase in the overall number of patients presenting at the Southmead Hospital site with stroke like symptoms that, after assessment, turn out to be another condition that needs further assessment or treatment. The most common stroke mimics are migraine aura, functional neurological disorder, seizure and decompensation due to systemic illness.

⁵⁹ The Clinical Co-Dependencies of Acute Hospital Services: A Clinical Senate Review, 2014

⁶⁰ Stroke Association - When it's not a stroke: a review of the research. May, 2018

Centralisation of hyper acute stroke services will enable more rapid assessment, diagnosis and determination of appropriate non-stroke care pathways. It is vital that patients with stroke mimics can be transferred to these alternative services as soon as possible. Some e.g. migraine will have a short LOS and can be rapidly discharged home; others will need to be moved to other inpatient services, either at North Bristol or BRI or WESTON HOSPITAL:

- **Neurology** - Some of these patients will need to be repatriated to the BRI or WESTON HOSPITAL following diagnosis. Currently the BRI and Weston stroke therapy services provide support for patients with neurological diagnoses. It is important that a specialist workforce at the BRI is maintained to support patients with a neurological diagnosis in order to allow repatriations after initial assessment/opinion. This must include an on-site named stroke or neurology responsible consultant. Additionally, on-site specialist therapy would be required to provide timely care.

Option 2 offers more resilience on the BRI site with regards to this patient group as neurology patients would be cohorted, as now, with stroke patients for their inpatient care and gain benefits in shared nursing, therapy and medical support. Under Option 1, workforce provision is made for stroke patients that cannot be transferred to Southmead Hospital but further work is required to establish the neurology activity that would remain, and to ensure a suitable service offer between Southmead Hospital and BRI clinicians. This is important because bed planning and cost assumptions associated with the stroke pathway do not take into account an increase in neurology activity at Southmead Hospital.

- **Other mimics** – It is important that inappropriate admissions are not made to Southmead Hospital as a result of the proposed reconfiguration of stroke services. This will be disruptive to patients and put undue pressure on North Bristol Trust services if it occurs. In order to minimise hospital transfers, conveyance to the HASU will be supported by pre-hospital triage wherever possible. Digital advancements in telemedicine and remote imaging will also support this (see Section 9.4). When patients do arrive at Southmead Hospital rapid diagnostic assessment on the stroke pathway will determine whether specialist stroke care is required; if it is not, a prompt repatriation process will be required in order to swiftly return patients back to their local hospital, or appropriate other services at Southmead Hospital.

9.1.4 Neurosurgery

Southmead Hospital has access to onsite neurosurgery for complications of stroke such as malignant MCA syndrome and intra-cerebral haemorrhage, which requires urgent neurosurgical intervention, and is usually seen in the early days post-stroke. For patients on the unit, this would provide best practice care, and would improve the overall level of stroke care currently available in the BNSSG region. All patients being on the same site as the neurosurgical unit for HASU care means that specialist intervention for neurosurgical complications is available to everyone that needs it. This is a benefit of the proposals for change and enhances patient safety. No



assumptions have been included regarding changes to neurosurgical activity because the complication rate is small and the vast majority of patients that require neurosurgical intervention are already transferred to Southmead Hospital and are therefore included in the baseline position.

9.1.5 Intensive Care Unit (ITU)

Specialist ITU provision will be available to all stroke patients that require it at Southmead Hospital. Activity analysis across the three hospital sites has determined that the vast majority of ITU activity associated with stroke care is already within Southmead Hospital due to the co-adjacency that already exists on that site with neurosurgery. ITU activity resulting from stroke in the BRI and Weston is negligible. The bed modelling undertaken for the programme therefore assumes that there will be no change to ITU provision on the Southmead Hospital site as a result of these proposals.

9.1.6 Cardiology and cardiothoracic surgery

The UHBW Bristol site provides the cardiac centre for the region, the Bristol Heart Institute. There is an increased risk of inpatient stroke and it is important that appropriate services are in place. Patients that experience a stroke as a complication of cardiothoracic surgery are not expected to transfer to the HASU as a result of the specialist care needs that they have, that need to be provided by cardio-thoracic specialists based in the Bristol Heart Institute (co-adjacent to the BRI). Currently, onsite stroke support is provided by the BRI based specialist stroke team, Monday to Friday.

In Option 1, on-site specialist medical and therapy support has been included in the workforce and financial analysis to manage inpatient strokes patients who need to remain at the BRI site because they require specialist cardiac care only available at the co-adjacent Bristol Heart Institute, or are too unwell to be transferred. These clinicians would provide specialist stroke care to the circa 60 patients per year that would be unable to be transferred to the HASU at Southmead Hospital and would need ongoing stroke treatment delivered at the BRI throughout the course of their hospital stay (and access to the ICSS post-discharge). Efficiencies to the workforce model have been built in to support delivery of this model, for example, through basing the Bristol TIA clinic provision at the BRI during the working week.

In Option 2, the specialist stroke medical and therapy clinicians based at the ASU at the BRI will provide specialist stroke care for cardiac patients unable to transfer to the HASU.

In both options, 24/7 stroke advice and support would be available to the cardiac clinicians via the HASU medical team.

9.1.7 Interventional Radiology

Interventional radiology is an important part of modern management of stroke. As for diagnostic provision, centralising immediate care in one location supports access to interventional radiology and specifically, thrombectomy. The more stroke patients that can be brought to a thrombectomy site, the more opportunity there is to provide

rapid, life-saving/disability preventing treatment. Because the BNSSG population can all access the thrombectomy centre at Southmead Hospital within 45 minutes by blue-light ambulance the benefits of reaching a site with thrombectomy expertise outweigh the benefits of more rapid transfer to a local hospital that doesn't have interventional radiology (thrombectomy) support.

Enhancements are planned to the Southmead Hospital Thrombectomy Service to improve 24/7 cover and increase the number of patients that receive this intervention each year. These plans are closely linked to this business case more detail is in Chapter 10 Service Improvements.

9.1.8 Vascular surgery

Regional vascular surgery services are centralised at North Bristol Trust. A weekly vascular surgery MDT is run at Southmead Hospital. Centralising hyperacute stroke services at NBT will improve the referral process, allowing more rapid assessment in person while a patient is in hospital where necessary. It will also support improved referral practices and MDT discussion as stroke physicians will be able to attend vascular surgery MDT meetings.

9.1.9 Acute medicine, including geriatric medicine expertise

Following reconfiguration, it is likely that there would be a number of patients that presented to the Southmead Hospital A&E with acute medical problems that cannot be safely managed within the stroke unit. These patients (known as "stroke mimics") would be assessed in the A&E and then potentially transferred to the Acute Medicine Unit (AMU). No assumption for increased provision for non-stroke patients has been made within this business case and repatriation to the BRI or Weston Hospital medical teams would be required. Any impact on Southmead Hospital AMU is likely to be significantly mitigated by the proposed change in pathway to divert primary care stroke referrals from AMU to HASU.

Further to this, many patients with stroke are co-morbid and frail. There is therefore a requirement for the HASU and ASU(s) to have support from a consultant led acute medicine team working within an AMU plus/minus a co-located acute frailty assessment unit, 7 days per week, for a minimum of 12 hours per day. It is essential that this team has the capability to undertake comprehensive geriatric assessment (CGA).⁵⁹ No cost provision has been made for this within this business case and it is anticipated that the development of this service at Southmead Hospital would include provision to support the specialist stroke wards.

Provision will be made in both options to ensure that the standard of care can be maintained, or improved, for patients repatriated from Southmead Hospital to the BRI or to Weston Hospital and for non-stroke patients currently cared for under existing stroke teams. The future model of care for these patients will be agreed between all organisations.

9.1.10 IT and Communications

There is a requirement for the BNSSG stroke service to have a clear IT and communications infrastructure to enable effective and seamless communications

and information sharing across hospitals, the community and different provider organisations. There are separate work programmes that are enabling this across BNSSG and links have been made to the BNSSG digital transformation programme. There will be clear governance and data sharing agreements in place between UHBW, NBT, Sirona and other necessary organisations. This is particularly important in relation to image sharing; direct contact with HASU specialists must be facilitated, so that patients are not transferred away from their local care provider unnecessarily. More information about the digital transformation opportunities specific to stroke care is included in section 10.5.

10 Service Improvements

10.1 A new Integrated Community Stroke Service (ICSS)

The Integrated Community Stroke Service (ICSS) will be a specialist service working across BNSSG to deliver the highest quality care and rehabilitation for people following stroke through an appropriate pathway. The service has been co-designed with people impacted by and with lived experience of stroke and is in line with the draft NHS England and Improvement (NHSEI) National Stroke Service Model. The ICSS will work in partnership with stroke survivors and their families to achieve the best possible health and wellbeing outcomes, enabling people to become as independent as possible at home and in their local community, and supporting them to confidently manage their long term recovery once active rehabilitation has ended. The service will also ensure that people who require long-term care or palliation following stroke will have access to the support that they need.

A key feature of the ICSS will be timely and seamless transfer of care from an acute hospital into the community. Early Supported Discharge and longer term rehabilitation will be delivered by the same service to support the service user and their family at home, and throughout their rehabilitation journey, improving continuity of care and eliminating multiple handovers and waiting times for other generic community services.

People who are medically well enough to leave acute hospital but unable to return home and/or who require a further period of stroke specialist inpatient care and rehabilitation will be supported in locality based ICSS Sub-acute and Rehabilitation Units (SSARU) with timely supported discharge home at the earliest opportunity.

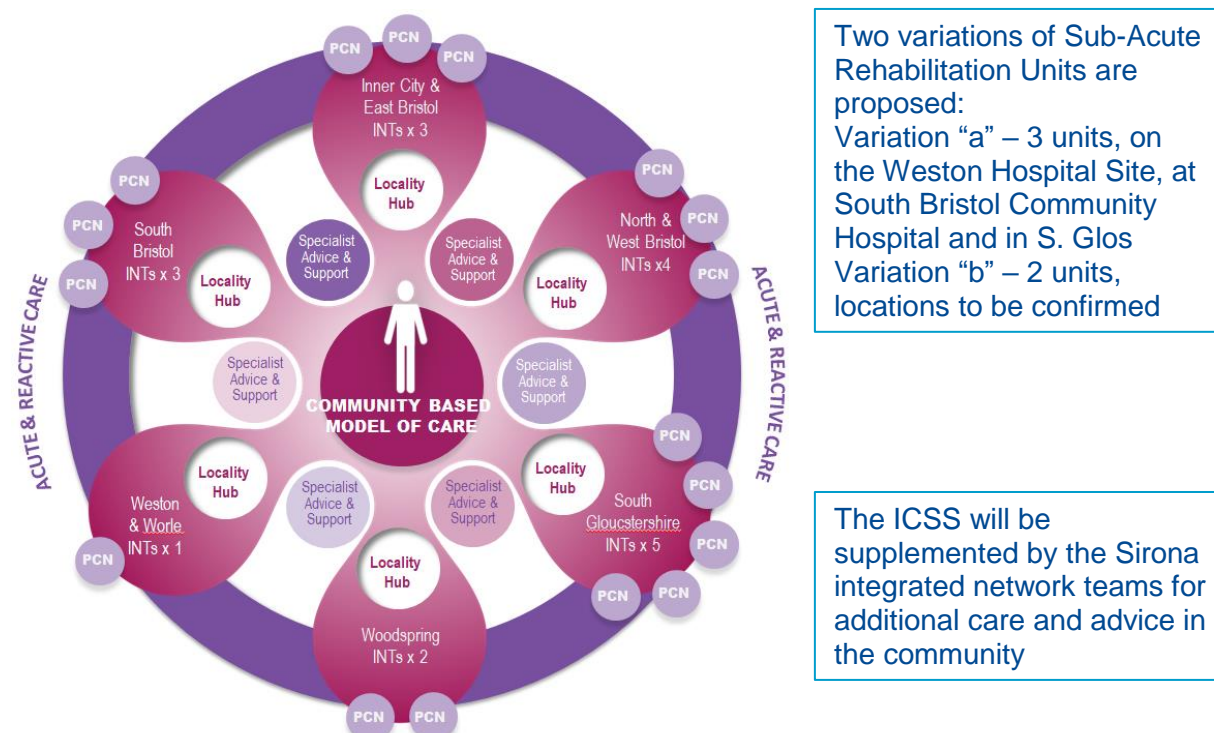
The ICSS will deliver streamlined, coordinated, equitable care and rehabilitation across BNSSG, improving health and wellbeing outcomes and providing a positive and motivating experience for service users and their families and carers. The service will support people to have the highest quality of life possible, close to home.

The service will work to improve integration between health and social care services. Through joint working, education and training, there will be a BNSSG wide stroke skilled workforce who will work in partnership with community and charitable sector organisations to meet people's longer term recovery and reintegration into their local community.

The ICSS will establish close working links with colleagues in acute care as well as with the BNSSG Primary Care Networks, Integrated Network Teams, Wellbeing Hubs and other specialist community services supporting service users to access other relevant services providing wrap around care and ensuring all health and social care needs are addressed.

Figure 30 shows the potential interface of the ICSS with Sirona Care and Health's existing local community service provision. The ICSS will be a specialist resource able to provide advice and guidance to other health, social care and voluntary services.

Figure 30 - ICSS model and interface with the Sirona Care and Health Community Provision across BNSSG



Two variations of Sub-Acute Rehabilitation Units are proposed:
 Variation “a” – 3 units, on the Weston Hospital Site, at South Bristol Community Hospital and in S. Glos
 Variation “b” – 2 units, locations to be confirmed

The ICSS will be supplemented by the Sirona integrated network teams for additional care and advice in the community

PCN = Primary Care Network
 INT = Integrated Network Team

The development of a local Stroke Specific Education Framework has previously been supported by the Bristol Stroke Health Integration Team (HIT), with training available to all registered and non-registered health and social care colleagues working across the stroke pathway. The ICSS service will continue work in partnership with the Stroke HIT and the University of the West of England (UWE) to ensure all learning and development needs are met. It will also be registered with the Sentinel Stroke National Audit Programme (SSNAP) ensuring consistent recording of rehabilitation inputs thereby providing a comprehensive data set from hyper-acute care management through to 6 month review across BNSSG.

10.1.1 Development of the ICSS Model

The ICSS model has been highly informed by the engagement work undertaken by the BNSSG Stroke Programme. Co-production of the clinical pathway, coupled with national best practice and clinical guidance, including reference to the recently released NHSEI National Stroke Service Model, means that it responds directly to what people have said is important to them (Chapter 5) as well as meeting the requirements of the NHS Long Term Plan⁶¹. There has been advanced partnership working between providers, clinicians and all stakeholders across the BNSSG area in order to describe a service model that is contributed to, recognised and supported by all. This has also been overseen and developed by the stroke Clinical Design Group and ICSS Clinical Design Sub Group, highlighted within the programme

⁶¹ <https://www.longtermplan.nhs.uk/online-version/chapter-3-further-progress-on-care-quality-and-outcomes/better-care-for-major-health-conditions/stroke-care/>

governance structure in Appendix 2. Sirona Care and Health have drawn on their experience of implementing and delivering a community stroke service in Bath and North East Somerset and likewise acute providers on their experience of delivering stroke specific rehabilitation and ESD services.

The ICSS service will provide a consistently high standard of specialist care and is being designed to meet the majority of relevant NICE guidelines and quality standards, National Clinical Guidelines (RCP Stroke Guidelines⁶² and BASP guidelines⁶³) and SSNAP standards.

The ICSS will work collaboratively with the HASU and ASU teams to co-ordinate timely and seamless transfer of care from hospital into the community. Referrals to the ICSS will be managed by the Community Integrated Care Bureaus (CICBs) who are a team of professionals from health and social care. They use information gathered from hospital teams to identify the most appropriate location for discharge to meet an individual patient's on-going needs, with the aim of providing the right support, at the right time, in the right place for your recovery. Referrals will be sent via a single referral form (SRF) to the appropriate locality based CICB who will manage flow into the Sub-acute Stroke Units and ICSS at home and will have oversight of the overall capacity in the ICSS. Ongoing work on the referral process will facilitate effective discharges through this system and ensure the necessary patient flow from hospital to community care that is required to support the planned acute stroke bed base.

ICSS clinicians will work collaboratively with the HASU and ASU teams at the earliest opportunity to determine the most appropriate community pathway for patients and seek to transfer patients safely out of hospital as early as medically appropriate and enabling home-based rehabilitation support and care as much as possible.

10.1.2 ICSS pathways

The majority of people discharged from HASU and ASU will be supported to return home and continue their rehabilitation at a level and intensity appropriate to their clinical needs and goals.

Timely transfer of care aligns with the current “Home First” and “Discharge to Assess” models, improving functional and wellbeing outcomes and often reducing long term care needs. A thorough checklist and safety criteria are applied by the discharging team before discharge. Details on early assessment and individual patient progress and goals are transferred to facilitate the ongoing assessment of needs by the community team. Current Early Supported Discharge (ESD) models will be enhanced to become a 7 day BNSSG wide “ICSS at Home” service. Intensity of input following hospital discharge will be according to clinical needs and with the same intensity and expertise that they would receive in hospital (NICE QS2 statement 4⁶⁴). This will enable service users to be supported at home safely, with

⁶² [https://www.strokeaudit.org/SupportFiles/Documents/Guidelines/2016-National-Clinical-Guideline-for-Stroke-5t-\(1\).aspx](https://www.strokeaudit.org/SupportFiles/Documents/Guidelines/2016-National-Clinical-Guideline-for-Stroke-5t-(1).aspx)

⁶³ <https://www.basp.org/wp-content/uploads/2017/04/BASP-StrokeStandards-June-2014.pdf>

⁶⁴ <https://www.nice.org.uk/guidance/qs2/resources/stroke-in-adults-pdf-58292707525>

input from the ICSS alongside other support as is available in individual circumstances e.g. family members.

The core of a clinically effective “ICSS at Home” (ESD) service is a multi–disciplinary team (MDT), which will comprise of:

- Occupational Therapy
- Physiotherapy
- Speech and Language Therapy
- Nursing
- Rehabilitation Support Workers
- Psychology
- Dietitian
- Voluntary Sector
- Social Worker

ICSS at Home will have pathways in place to access stroke consultant support and other community services including Social Care, Primary Care Networks, Integrated Network Teams, Health and Wellbeing hubs and specialist services to ensure all health and social care needs are addressed (see interdependencies).

ICSS assessment and goal setting will begin prior to hospital discharge integrating with assessments already started in hospital. The ICSS service will provide Therapy or Rehab Support Worker visits daily over 7 days a week, as appropriate for each individual. These visits will support rehabilitative practice of activities of daily living, such as personal care and meal preparation and to deliver tailored rehabilitation programmes. Visits for personal care and meal preparation may be provided by in-house support staff or ring-fenced stroke skilled social care reablement workers. This remains in discussion between social care and community providers. Specialist Therapists will work jointly with the service user and their family to build on person-centred goals already identified in hospital and to develop new goals and outcomes to guide the rehabilitation process. Rehabilitation will be delivered at an appropriate frequency and intensity to meet these goals (NICE QS2 statement 6⁶⁵).

Specialist nurses, Psychologists and Dietitians will work with service users as needed to assess and manage issues such as continence problems, pain, secondary prevention, medication management, mood and cognition and nutrition.

ICSS at Home will actively encourage self-management and social re-integration at the earliest opportunity, signposting and working in partnership with local community and voluntary services to support recovery via an integrated key worker model. The service will actively support people to return to work, where achievable, if they wish to, tailoring therapy interventions and liaising with employers to facilitate this (NICE QS2 Statement 5⁶⁶).

⁶⁵ <https://www.nice.org.uk/guidance/qs2/resources/stroke-in-adults-pdf-58292707525>

⁶⁶ <https://www.nice.org.uk/guidance/qs2/resources/stroke-in-adults-pdf-58292707525>

Rehabilitation visits will continue if the service user is making meaningful and measurable progress towards clearly identified goals, as indicated by national guidance, and will gradually reduce as independence increases.

Meetings with patients' family or relevant others will be arranged to provide an opportunity for shared discussion, goal setting, review and discharge planning. When goals have been met or no measurable changes are being made, the service user will be discharged with appropriate resources and information to support longer term adjustment and life after stroke. Service users can be re-referred at any time post discharge if they have defined stroke specific needs and goals.

If long term care needs are identified, ICSS will provide comprehensive handover to social care services to ensure a seamless transfer and on-going enabling approach to care. Further work on supporting the most timely care assessments is being developed with all social care providers, and may include enhancing the skills of a defined pool of social workers to support the needs of stroke survivors.

10.1.3 ICSS Sub-acute Rehabilitation Units

'People with disability after stroke should receive rehabilitation in a dedicated inpatient unit and subsequently by a specialist team in the community'
NICE Guidance - Stroke Rehabilitation in Adults⁶⁷

Wherever possible, the 'ICSS at home' will facilitate discharge from the HASU, ASU or SSARU at the earliest opportunity, continuing to provide therapy at a level of intensity appropriate to clinical needs and person centred goals at home or at place of residence. However, some people are unable to return home immediately following the acute episode due to their high level of medical, nursing and therapy needs. The proposals for consultation describe two variations of SSARU care for BNSSG. It is recognised that family and friends are an important part of the recovery and rehabilitation process following a stroke and the benefits of having 3 SSARUs distributed across the BNSSG area (such as accessibility), versus the benefits of having economies of scale that 2 SSARUs offer, have been fully considered as part of the consultation process.

The SSARUs form an important part of the ICSS and will be available to all who need them, regardless of their location. This will ensure equity of access for all BNSSG residents. Under the proposed service model, people needing SSARU care will receive an appropriate period of inpatient rehabilitation followed with timely supported discharge with ICSS at Home at the earliest opportunity.

The SSARUs will be supported by locality based community teams including ICSS at Home, Integrated Network Teams and Wellbeing Hubs and, where possible, these will be aligned with the Local Authority's social care services. The aspiration is that as a single stroke specific workforce, staff will be able to work flexibly throughout the parts of the service at times of need to maintain consistency of services provision.

⁶⁷ <https://www.nice.org.uk/guidance/cg162/resources/stroke-rehabilitation-in-adults-pdf-35109688408261>

The sub-acute rehabilitation units will support flow from the HASU and ASU(s), receiving patients as soon as they are deemed medically fit for transfer, bringing care into the community and minimising lengths of stay in an acute hospital. They will provide on-going specialist nursing care and rehabilitation for stroke patients who no longer require acute care and daily specialist medical review but still have high level of medical, nursing and / or therapeutic needs which cannot be safely managed at home by 'ICSS at home'. This may include, but is not limited to, patients with the following needs:

- Management of IVs and PICC lines
- Insertion and management of NG tubes and bridles
- Management of medical complications e.g. pneumonia, seizures
- Daily access to antibiotic prescribing
- Patients with bariatric needs
- Complex cognitive and or communication difficulties
- Complex physical impairments where access to a specialist rehab gym facility is required with sessions involving multiple therapists
- 1:1 support for behavioural issues
- Complex manual handling and equipment needs e.g. 3 to transfer
- Specialist nursing care for appropriate positioning and postural care, pressure area management, continence and dysphagia management
- Daily access to specialist Speech and Language Therapist regarding dysphagia management
- Daily access to Dietitian for specialist nutrition and hydration advice
- High level night-time needs

Stroke Consultant support will be provided through twice weekly ward rounds and MDT/discharge planning meetings, which may be provided in person or virtually.

There will be close working links with the acute team(s) and clear pathways to access the appropriate level of medical support, which will include:

- On call Consultant and/or Registrar via immediate telemedicine video link
- Advice and guidance telephone line for non-urgent queries

There will be a clear pathway with acute services for PEG/RIG insertion and another for spasticity management, which is currently still under development, but will be a service adequate to meet the needs of all stroke patients who present with spasticity affecting function or quality of life.

Seven day clinical cover and review will be provided by Advanced Nurse Practitioners (ANP) that specialise in stroke care, and medical cover managed across the pathway. Support from the HASU to the sub-acute rehab units will be available 24 hours a day, 7 days a week. The SSARUs will also have access to Rehab Consultant and Consultant Therapist input for specialist advice and guidance (linked to PCAT⁶⁸) for the management of ongoing rehabilitation following stroke.

⁶⁸ <https://www.england.nhs.uk/wp-content/uploads/2014/04/d02-rehab-pat-high-needs-0414.pdf>

Specialist care will aim to prevent readmission to acute care, however, there will be clear pathways in place for transfer back to the acute hospital in the event of both neurological and non-neurological deterioration (patients with non-neurological deterioration who are receiving active rehabilitation will return to the acute stroke unit).

SSARUs will have access to diagnostics (for example XRay and videofluoroscopy), and specialist equipment and seating to support recovery. The environment will be conducive to rehabilitation and include access to a gym and assessment kitchen. There will be a clear pathway with acute services for PEG/RIG and spasticity, and for orthotic assessment and provision.

ICSS at Home will work closely with inpatient colleagues to facilitate a seamless discharge into the community at the earliest opportunity, reducing unnecessary long length of stay and ensuring flow across the pathway.

The core stroke specialist multi-disciplinary team in the sub-acute rehabilitation units will comprise of:

- Nursing - including ANP
- Occupational Therapy
- Physiotherapy
- Speech and Language Therapy
- Rehabilitation Support Workers
- Psychology
- Dietitian
- Stroke Registrar / Consultant (twice weekly ward-rounds and remote guidance)

During the design phase for the new SSARUs, the test and learn development beds at Thornbury (Community) Hospital for stroke rehabilitation, provided some rich learning for the system. This included revised thinking concerning practical rehabilitation premises design and facilities; and additional specialist training for staff. The length of stays in acute hospitals were reduced due to the flexibility that this unit and its staff provided. These points have all been recognised in the design of the new clinical model.

10.1.4 Service delivery

Stroke patients will be reviewed by the relevant therapists on admission to the ICSS and, in partnership with the service user and their family or relevant others, agree a person centred, goals led rehabilitation plan. Service users will be able to access support with therapy across 7 days a week, at a level and intensity that enables them to meet their goals. They will access psychology and dietetic assessment and intervention according to their level of need. The team will support service users to develop self-management skills at the earliest opportunity enabling meaningful participation in daily life. Family and carers will also be actively encouraged to support rehabilitation programmes.

“You build yourself up Monday to Friday and then nothing for 2 days. It’s one step forwards and two steps back.” “You don’t have a break in your life at weekends do you?!” - Service User with recent lived experience of stroke

The team will have good working links with other health and social care colleagues who provide additional support and expertise to the in-patient units to make sure all health and social care needs are met (see interdependencies).

Nursing and therapy teams will provide information, education and training and signpost service users and carers to relevant voluntary organisations and community support. Relevant Stroke support voluntary sector organisations will have an active presence on the units, liaising with the MDT and supporting patients and their families and carers. Regular family meetings will be scheduled to provide an opportunity for shared discussion, review and discharge planning.

ICSS at Home will work collaboratively with colleagues on the Sub-acute Rehabilitation Units and attend weekly consultant led multi-disciplinary team meetings and goal review and family meetings and plan joint sessions including access and home visits, where appropriate. This will ensure service users, and their families, experience a coordinated and seamless transfer home at the earliest opportunity once they are able to manage safely with support.

The MDT will work collaboratively with social workers to ensure timely assessment for people who have longer term care needs. This may include a long term package of care or 24 hour care in a residential or nursing home setting. Some service users may be referred to social care assessment beds or interim community placements for on-going assessment while more complex long term packages of care or placements are put in place.

People cared for in these social care assessment beds will be seen by ICSS at Home if the patient has active goals or other needs are identified such as posture or positioning management, spasticity management or dysphagia. Where possible they will work to reduce care needs and support service users to return home if this is an achievable longer term goal.

If the MDT recognises that a service user is dying then a structured end of life plan will be put in place to meet their needs and wishes, including their preferred place of care and death. ICSS at Home will provide support in the community if appropriate, working in collaboration with other community teams providing end of life care.

ICSS aims to provide an integrated service across bedded rehab and community rehab. The workforce to deliver the service will include those currently working within existing stroke services across acute and community organisations. Staff from the community team and the beds teams will work closely together often completing joint sessions and may in-reach or outreach when appropriate. Timely discharge from the SARU will be supported by a discharge coordinator. They will work closely with clinicians on the units and in the community, voluntary sector and social care colleagues as well as service users and their families to ensure information sharing and services are in place for discharge.

The community ICSS staff will be flexible according to the need of those on the caseload which may involve in-reach to HASU, ASU and SSARU, supporting service users on their first days and weeks at home or continuing to provide rehabilitation for weeks after discharge as well as enabling self- management and providing advice and support to social care workers, care home staff and staff in integrated network teams. Input, therapy and support of an individual will be tailored to the individual's needs but will gradually decrease as care transitions to other community services and self-management. The ICSS staff will be locality based to support consistent operational delivery but be flexible to support other areas to facilitate flow. Contact from a voluntary sector employed keyworker will be offered to all people under ICSS and their families and will be a core member of the MDT enabling rehabilitative activities or practical support and being the bridge to longer term community activities and social prescribing as well as carrying out 6 month reviews. It will ensure that the needs of carers are also supported.

Links with VITAminds (the commissioned service for talking therapies in BNSSG) will ensure that those who would benefit from their offer for talking therapies, which are delivered at whatever level an individual needs, are appropriately referred to manage issues related to their long term condition.

The ICSS will link closely with locality teams and Primary Care networks for holistic care of the service user with the stroke specialist nurse having a key role in liaison with GPs for medical management and secondary prevention.

Finalised operational processes are being developed by the clinical design group.

10.1.5 ICSS Rehabilitation or management for people discharged to a Residential or Nursing Home

People may require long term care in a residential or nursing home setting due to high levels of nursing or care needs. This may be due to complex medical, physical or cognitive factors, manual handling needs that cannot be managed in their home environment or the need for 24 hour support or supervision. Requirement for a long term placement may occur at any point of the pathway but is usually determined after a period of rehabilitation.

All people who are discharged following acute stroke to a residential or nursing home will receive assessment and treatment where appropriate in the same way as those discharged home and described above (ICSS at Home). The ICSS at Home will support the service user to return home if this is an achievable long term goal.

If no active rehabilitation goals are identified, a management plan will be agreed with the service user, carers and family. This may include assessment and management of posture, specialist seating, upper/lower limb spasticity management, mobility and transfers, continence, feeding, swallowing and nutrition and pressure care. ICSS at Home will provide education and training for carers and families and signpost to voluntary organisations via integrated key workers and community resources to support life after stroke.

10.1.6 Review

All stroke survivors discharged home with no ongoing rehabilitation needs will be offered a comprehensive health and social care review at 6 weeks post stroke. This will include secondary prevention and healthy lifestyle advice and signposting to any relevant services to support on-going recovery.

The ICSS will also enable a comprehensive health and social care review at 6 and 12 months after stroke (6 month reviews will be undertaken by the voluntary sector keyworker role, and work is underway to embed 12 month reviews in primary care) and annually thereafter (NICE QS2 statement 7⁶⁹) to all service users and provide advice and guidance as required, signposting to any relevant health, social care or voluntary services.

If required, people can be referred into ICSS at Home for a period of stroke specific rehabilitation, referred onto other medical or community services or signposted to life after stroke services.

10.1.7 Community Referrals

The ICSS will triage community referrals for any person who has been identified as having stroke related problems which are within the scope of the service. Patients returning to BNSSG from out of area will be accepted directly into the ICSS to avoid a “hospital to hospital” transfer. Service users known to the service will be able to self-refer. Referrals may be accepted by the ICSS service or referred onto other services e.g. Integrated Network Teams with advice and training as required.

10.1.8 ICSS Interdependencies

Interdependencies include, but are not limited to:

- Diagnostics – XRay and videofluoroscopy/FEES:
- Social work
- Orthotics
- Orthoptics
- Podiatry
- Pharmacy
- Wheelchair services
- Specialist services including - Diabetes, Frailty, Continence, Tissue Viability
- Stroke Association
- Bristol After Stroke
- Carers Support Centre
- Vita Minds
- Vocational Support Services
- AAC West at Bristol Enablement Centre
- Home Management Service

⁶⁹ <https://www.nice.org.uk/guidance/qs2/resources/stroke-in-adults-pdf-58292707525>

These services would be accessed on specific need as part of the stroke survivor's overall care, referrals made to outside agencies or provided through a service level agreement with the provider organisation. Services should be able to be accessed in an equitable way across BNSSG. Interfaces with the above listed services would follow different routes but will continue to be developed by the clinical design group. Reports, assessments or details of interaction with these services will be documented in the service user's medical records.

Specialist services which are not currently available across all or any of BNSSG, but will continue to be developed by the stroke programme team and clinical design group, include:

- **Spasticity management:** There are a number (approximately 10-30%) of patients who experience spasticity following stroke which causes functional or other problems. To address individual patients' needs it is planned that a specialist spasticity management service will be formed 'in-house' and delivered effectively, efficiently and sustainably by a combination of stroke specialist physician(s) and advanced/extended scope AHP(s), in communication and collaboration with rehabilitation medicine specialists within the region. Work is ongoing to define the practical delivery of this service, guided by national guidance from the Royal College of Physicians (Spasticity in adults: Management using botulinum toxin).
- **Functional electrical stimulation (FES) service:** An effective and evidence-based intervention for a range of physical symptoms. The ICSS would develop clinicians through training and competency frameworks to be able to deliver this intervention widely and equitably to optimise patient outcomes.
- **Robotics and other technologies for rehabilitation, including tele-rehab:** Access to and delivery of these adjuncts to rehabilitation are also currently inequitable across BNSSG. The ICSS would deliver service-wide training, led by "in-house" clinicians to ensure that clinicians' time is used most efficiently, patients have maximal opportunity to engage in exercise and other therapies safely from their own home and that robust options are available in response to balancing the risks and needs of patients needing to be isolated or socially distanced for example as a result of COVID-19.

10.1.9 Highly specialist rehabilitation needs following acute stroke

A significant proportion of patients with stroke have some highly complex needs (Category A or B - PCAT) but don't fulfil the criteria for a highly specialist rehabilitation service. The ICSS, with its skilled stroke specialist workforce, will provide for these needs, improving equitable access to specialist rehabilitation outside highly specialist rehabilitation services.

A small proportion of patients with highly complex needs (multiple Category A or B needs – as determined by the Patient Categorisation Tool – PCAT²) will require transfer to a Level 1 or Level 2 specialist brain injury inpatient rehabilitation unit (such as the Frenchay Brain Injury Rehabilitation Centre – BIRU). Transfer will usually be via SSARU except where the patients' needs exceed those that can be safely managed by SSARU e.g. a patient with tracheostomy, in which case timely transfer will be from the acute hospital. Assessment for this transfer will generally be

completed from one of the SSARUs and will require communication with and or consultation by Rehabilitation Medicine specialists – work is ongoing to define the nature of this with the aim being a digitally enabled remote assessment with support from appropriate SSARU staff to facilitate the assessment.

Once a patient with stroke reaches a point where their needs can be safely met on SSARU or by the ICSS at home (outside a 'Level 1' or 'Level 2' facility), they will be able to be transferred in a timely way, to one of the SSARUs (which will be Level 3a facilities), or, if appropriate, discharged home with the support of the specialist ICSS workforce. Discharge or transfer planning will be co-ordinated between the ICSS team and relevant other unit discharge co-ordinators and clinicians. Thus, the ICSS will support shorter lengths of stay to be achieved in the BIRU facility as local community based rehabilitation is enhanced.

Handover of patient information between the re-configured BNSSG stroke pathway and any other provider, such as BIRU, would be via clinician-to-clinician handover. Referrals back into the service would be via Single Point of Access with a Single Referral form, these would therefore be triaged and handled in the Single point of access and an appropriate clinician(s) consulted about clinical details.

In consideration of the interaction between patients in the stroke pathway and the services delivered by the Bristol Head Injury Therapy Unit (HITU), it is considered that patients will not need to be referred to this service as the ICSS will meet the needs of stroke patients in the community. In the case of need for Neuropsychiatric services, ongoing work is being conducted and discussed by members of the clinical design group to define the most appropriate way of accessing these services for stroke patients. Communication concerning the details of the stroke services reconfiguration, the interaction with BIRU, HITU and other specialist rehabilitation providers and any impacts, will continue through the development process.

10.1.9 Service development

The ICSS will build on recent new ways of working, exploring the use of teleconferencing to enhance partnership working and service resilience e.g. with health and social care colleagues and acute providers, as well as delivering medical and therapy advice and support direct to the service user and their family via telemedicine/rehab. The service will explore the use of apps and other technological solutions, which can be used as an adjunct to therapy to maximise recovery and promote self-management. The ICSS will also support activities to support life after stroke, such as drama and music, and will collaborate with the voluntary sector and Stroke HIT to investigate and trial these, undertaking research and efficacy studies where appropriate in order to share learning and spread successful interventions.

To encourage a self-management approach, the ICSS will ensure that staff receive training (such as Bridges Self-Management approach) to provide a consistent approach in enabling service users to manage their own condition to improve long term individual outcomes and increase service efficacy.

The service will continuously seek feedback from service users and their families as part of an on-going evaluation process. Service users will be encouraged to be

involved in quality improvement through collaboration and co-design so as to ensure that the service adjusts and adapts to patient and family needs.

The ICSS will be actively involved in data collection, reporting outcomes and participating in local and national audit (including SSNAP) and research to support service evaluation and improvement.

10.1.10 Voluntary sector

Services that provide support for life after stroke are essential. They not only provide personalised care but also give people information to minimise their risk of further cardiovascular events. This support may be through provision of timely, accessible information, community support either 1:1 or in groups, or help to encourage self-management, and empower stroke survivors and maximise health and wellbeing.

The ICSS will work in partnership with a range of community and voluntary sector organisations to support service users and their families across the whole pathway and throughout life after stroke.

Figure 31 provides an overview of the way in which people describe their journey following a stroke and

Figure 32 gives the detail of the support offer that has been outlined through the partnership of the Stroke Association and Bristol After Stroke.

The description, and delivery, of this support has and will continue to be co-developed by working in partnership with people affected by stroke, to meet the local needs identified. Service users and their families will be able to access tailored support when they need it. The voluntary sector (by way of the keyworker role) will be a central member of the MDT and will be involved in family meetings, discharge planning and goal setting as much or as little as the individual wants.

Figure 31 - The journey described by people affected by stroke

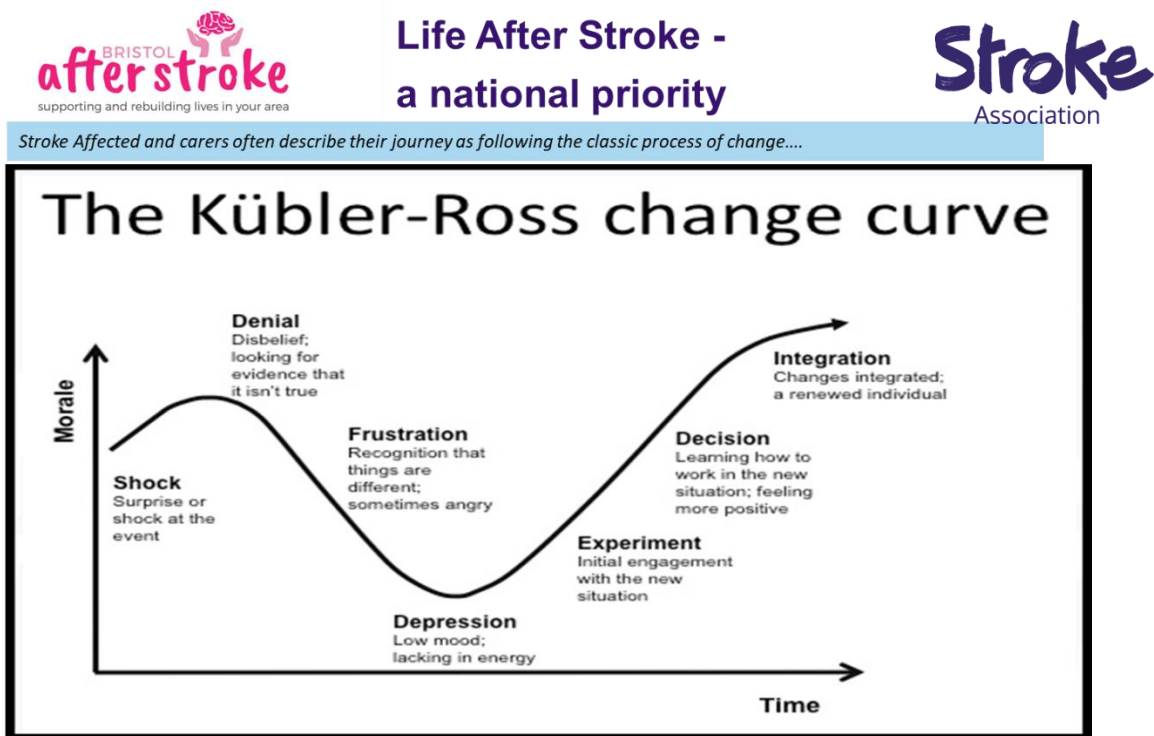
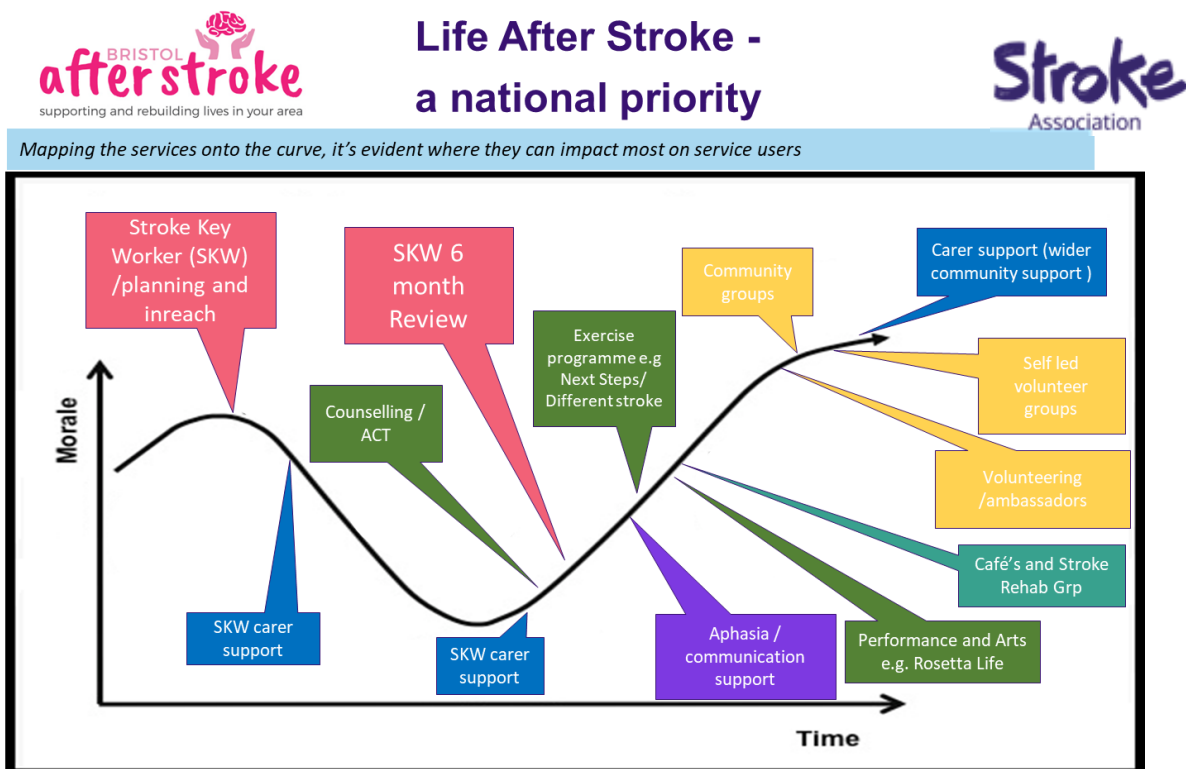


Figure 32 - The support offer proposed by the Voluntary Sector partnership in BNSSG



ICSS will work with the voluntary sector to provide education for informal carers of stroke survivors and to encourage peer support and self-management. “Different Strokes” is another charity onto which stroke survivors (particularly younger people) can be signposted and receive support, as are “InterAct” and “Rosetta Life”, who currently support stroke care locally.

Access to voluntary sector services will be through a single point of referral so that a range of services from different providers can be accessed. Services will be offered in a range of ways to suit as many as possible including groups, 1:1, telephone support, innovative digital solutions and services targeted specifically for younger stroke survivors. Services will include communication support, peer support, carer support and emotional support and may include other ways to improve wellbeing such as providing access to the arts.

The voluntary sector will have a presence from acute hospital admission and will have staff visiting the sub-acute units and in the community. They may help to facilitate peer support or access to digital solutions before the stroke survivor returns home. A stroke keyworker will be part of the community team to ensure joined up working with ICSS and a joint approach to achievement of service user goals and empowering people through self-management. The keyworker role will also refer patients on to and link them with existing wider community services and support groups, using a range of resources and databases to do this such as My Stroke Guide from the Stroke Association and Well Aware the national support charity.

The voluntary sector staff will have knowledge and skills outlined in the stroke specific education network and will work with clinicians across the pathway and people with lived experience of stroke for advice and training and in order to improve services.

6 month reviews will be carried out by the stroke key worker with support from the ICSS as necessary.

In summary, in line with the Life After Stroke Service Specification⁷⁰ services for life after stroke will include:

- Stroke Key Workers
- Personalised Care and Support Planning
- Post-Stroke Reviews
- Stroke-Specific, Community-Based Support including:
 - Communication Support
 - Carer Support
 - Peer Support
 - Health & Wellbeing Support
 - General and focused physical activity and exercise
 - Prevention, including behavioural modification
 - Advocacy
 - Navigation of services
- Wider Community-Based Support, including Social Prescribing

⁷⁰ Currently draft Stroke Association / NHSE document – yet to be formally published

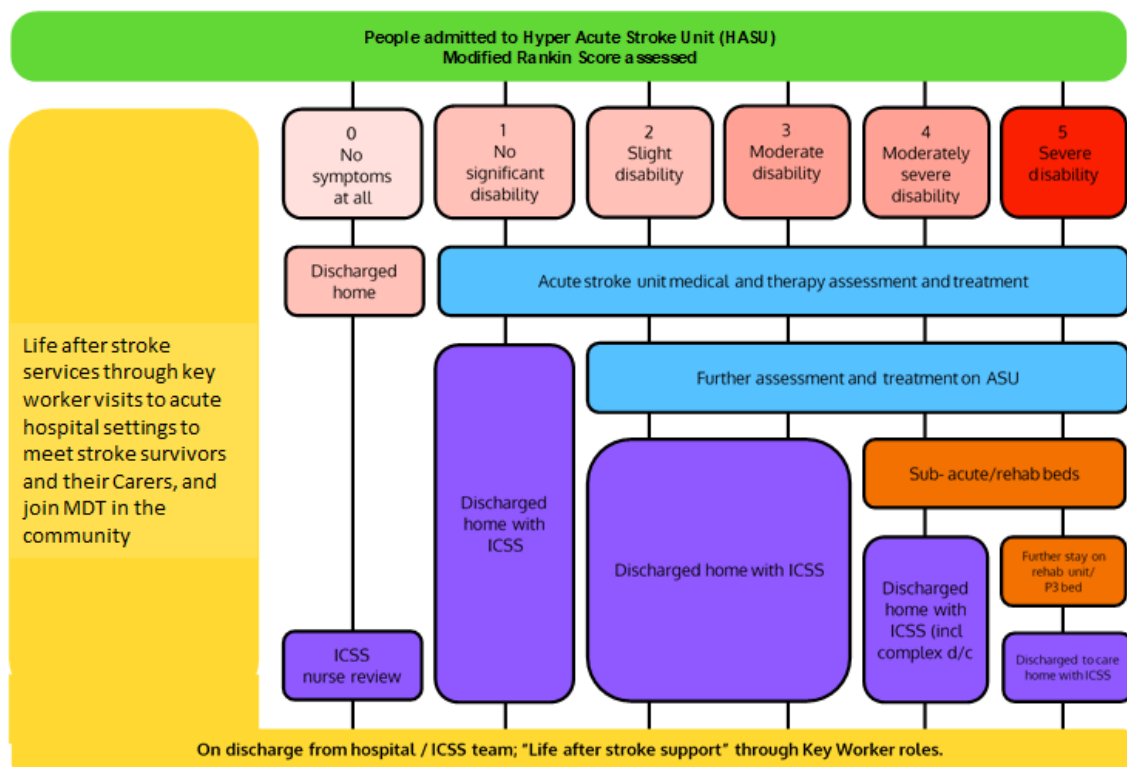
An overview of the patient pathway with the Life After Stroke service offer spanning the proposed service provision can be seen in Figure 33.

It is anticipated that the voluntary sector will be able to deliver the above services equitably across BNSSG and, working in partnership with the ICSS, will be able to offer a tailored approach to each individual's needs. The detail and planning of implementation of the keyworker role is ongoing as part of the design process.

Figure 33 - Life After Stroke care in the proposed clinical model



Life After Stroke - a national priority



10.1.11 Psychological support

Psychological and emotional support has been identified as being a much needed resource in the future model by people with lived experience, clinicians and system partners. At present psychological support is minimal, the voluntary sector counselling provision is oversubscribed and IAPT (Improving Access to Psychological Therapies) services are not designed with stroke survivors in mind.

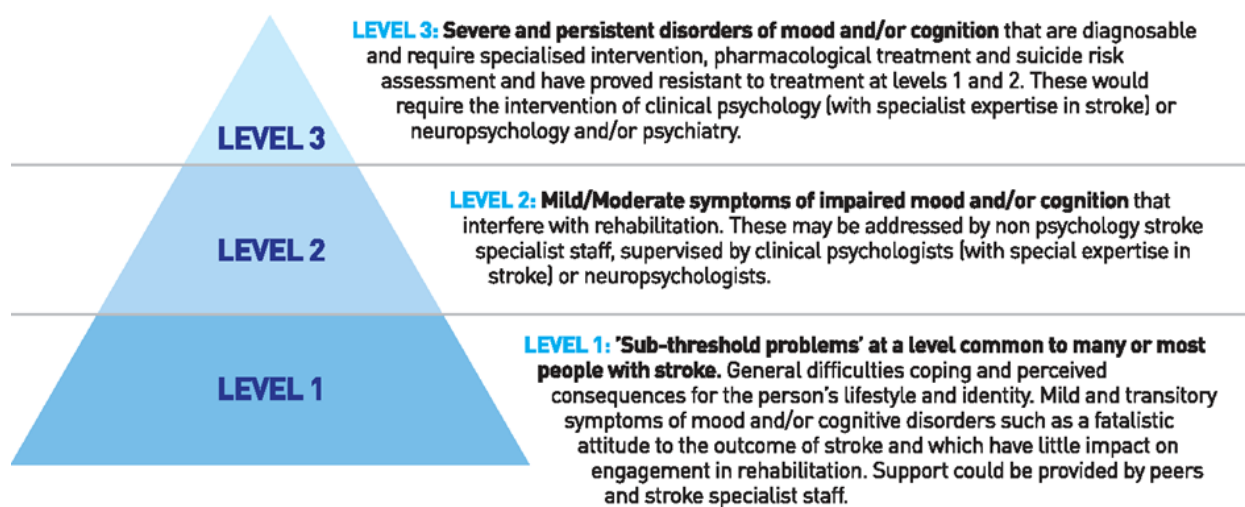
Psychology provision in the reconfigured model has been designed looking at the pathway as a whole to provide the most flexible workforce. Psychology resource has been focused mainly on the out of hospital part of the pathway due to this being the time at which the majority of service users will need to access psychological support.

People will be able to receive psychological assessment and intervention in the HASU, ASU, SSARUs and in the community by qualified neuropsychologists supported by psychology assistants. The staff will work in each locality across the SSARU and community according to levels of need often continuing working with service users as they are returning home. There will also be counselling available, cognitive behavioural therapy and support through IAPT and wellbeing initiatives such as peer support and carer support available through the integrated voluntary sector. Psychology provision will be overseen by a consultant neuropsychology lead. The IAPT services run by Vitamins are keen to improve their skills and knowledge in stroke and are linking closely with the Stroke Education group.

The psychology team will triage service users and determine the most appropriate level of intervention. This may include direct specialist neuropsychology assessment and intervention, advice and support for other members of ICSS in managing cognition/behaviour/emotional difficulties, programmes of therapy with assistants, a period of counselling or CBT or referral for more informal support with wellbeing.

A stepped approach to psychological care (Figure 34) is recommended by NICE guidelines for people suffering from depression and anxiety disorders, by the Department of Health (DH) Improving Access to Psychological Therapies (IAPT) programme⁷¹ and the Stroke Improvement Programme (SIP)⁷² improving psychological support after stroke consensus group.

Figure 34 - A stepped approach to psychological care



In the future model these levels of care could be accessed as follows:

Level 3	Neuropsychologist
Level 2	ICSS team including psychology assistants supported by neuropsychologists Counsellors
Level 1	IAPT services

71 Improving Access to Psychological Therapies (IAPT) programme www.iapt.nhs.uk

72 Stroke Improvement programme website www.improvement.nhs.uk/stroke

	Voluntary sector –peer support, carer support, arts and activity based interventions to improve wellbeing, communication support etc ICSS team trained by neuropsychologists
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10.1.12 Early outcomes of service improvement

In preparation for implementation of the proposed model and new ways of working in the community, a number of workstreams and engagement activities have taken place across health, social care, the Stroke Health Integration Team and the voluntary sector.

Regular meetings with representatives from across ESD, community teams and the voluntary sector have been focusing on design of the out of hospital model including workforce, transfer of information and integration of social care and the voluntary services. From these meetings separate workstreams have been developed.

Workstream	Aims and outcomes
Telerehab solutions	- Review of new telerehab solutions such as Evolv Rehab and Gripable by specialist clinicians
Information transfer	- Digital solutions for information transfer between acute and community services keeping in line with organisational data collection requirements -Discharge checklist and medically fit for discharge documentation
Social care integration	-Meeting with local authority representatives to develop integration between health and social care and the potential to ring-fence social care for stroke
ESD and community services	-Outlining the proposed model and the mitigating against any issues raised by existing community services. - Appreciative inquiry approach to development of ICSS service
Workforce	-Ensuring workforce is adequate to meet standards and skilled in stroke care
Staff engagement	-Staff briefing and engagement package sent to staff -Follow up Q and A sessions
Stroke Education	-To update a staff stroke competency framework -To link staff working in stroke to education opportunities -To create a career framework to support professional development -To ensure people after stroke have access to information and education opportunities
Voluntary sector engagement	-Partnership working to produce a joint offer for voluntary sector services for stroke survivors -Development of integration of the voluntary sector, social prescribing, stroke review process and access to wider community support into the ICSS model

10.2 Thrombectomy

10.2.1 Thrombectomy National Context

Achieving 7-day high quality stroke service is an NHS priority as set out in the Next Steps for the Five Year Forward Plan.⁷³ As part of NHSEI plans to introduce world leading and innovative healthcare mechanical thrombectomy was commissioned for patients who have certain types of acute ischaemic stroke. Since 2018/19 mechanical stroke thrombectomy has been routinely commissioned for patients, of all ages with proximal occlusion of the internal carotid or middle cerebral arteries who present early after the stroke before there is irreversible ischaemic damage to the brain.

The 2013 NHS Urgent and Emergency Care Review (UECR)⁷⁴, set out ambitions to centralise the management of serious conditions into a smaller number of hospitals to achieve reductions in mortality, and for stroke this required the creation of Hyper Acute Stroke Units (HASU) with minimum staffing provision covering consultant, nursing and therapy ratios. The 2019 publication of a draft commissioning policy and service specification for mechanical thrombectomy has specified that a Trust must be a HASU in order to be commissioned as a mechanical stroke thrombectomy centre⁷². As a nationally commissioned neuroscience centre, NBT has provided a 5-year action plan to deliver effective 24/7 mechanical stroke thrombectomy services to NHSEI.

Currently NBT is the 3rd biggest provider of mechanical stroke thrombectomy procedures in England however it is not currently a recognised HASU.

10.2.2 Thrombectomy Expansion at North Bristol NHS Trust

In response to a request from NHSEI to extend the current NBT mechanical stroke thrombectomy provision to a 24/7 service by 2022/23, NBT have extended the current 5-day service (8am-8pm) to a 7 day service (8am-8pm) from December 2020. A further business case is under development for 24/7 provision, alongside the delivery of stroke reconfiguration across Bristol, North Somerset and South Gloucestershire (BNSSG) in partnership with NHSEI Specialised Commissioning.

The clinical benefits of providing a mechanical stroke thrombectomy service are well supported by evidence, and have been formally recognised by NHSEI as a priority for specialised commissioning.

The natural history of the target population with large vessel occlusive stroke is that 80% of patients are left severely disabled or dead if no treatment is offered. On average, 50% of patients who are treated with thrombectomy will go back to independent life. To gain one more independent outcome, 6 people need to be treated, which indicates how powerful thrombectomy treatment is for these patients. This is particularly true when compared to other interventions such as acute

⁷³ <https://www.england.nhs.uk/wp-content/uploads/2017/03/NEXT-STEPS-ON-THE-NHS-FIVE-YEAR-FORWARD-VIEW.pdf>

⁷⁴ <https://www.nhs.uk/NHSEngland/keogh-review/Documents/UECR.Ph1Report.FV.pdf>

coronary intervention, where nineteen patients are treated to gain one additional positive outcome.

Stroke thrombectomy has been proven to be cost effective to both the organisations and to health and social care systems offering the treatment. NHSEI's National Stroke Programme⁷⁵ puts specific focus on thrombectomy and aims to:

- Deliver a ten-fold increase in the proportion of patients who receive a clot-removing [thrombectomy](#) to end their stroke so that nationally each year 1,600 more people will be independent after their stroke.
- Train more hospital consultants to offer thrombectomy in more sites, providing a national service.

Safe and effective thrombectomy provision also requires patients to receive care within a specialist Hyperacute Stroke Unit (HASU) for the immediate post-treatment phase; this is mandated by NHSEI⁷⁶. The components of HASU care are well-described and there is a strong evidence base demonstrating that HASU level care reduces mortality and length of inpatient stay.

10.2.3 Next Steps and links to PCBC

The BNSSG Stroke Programme has strong links to the development of the thrombectomy service at NBT. The proposed reconfiguration would:

- Ensure that all patients in the BNSSG area that could benefit from thrombectomy have the opportunity to be conveyed immediately to the HASU for assessment for this life-changing intervention.
- Establish NBT as a HASU, which will be important for the ongoing provision of thrombectomy, in line with the national commissioning policy.

The assumptions built into the capacity planning include the expected expansion of the thrombectomy service at NBT. Out of area patients are included in the HASU bed planning, in order to ensure that the planned hospital provision can support the expanded specialised service and local stroke care. The SWASFT ambulance conveyance modelling also includes retrievals outside of region so as to ensure that the capacity is adequate for the entirety of the planned service changes. More detail on this is provided in Chapter 11.

10.3 TIA clinic provision

A Transient Ischaemic Attack (TIA) requires rapid clinical assessment and treatment because of the risk that it is followed by a stroke. With the right early treatment this risk is markedly reduced (by 80% in one study)⁷⁷ and disability or premature death prevented. National guidelines [NICE-NG128] recommend that an assessment, with

⁷⁵ <https://www.england.nhs.uk/ourwork/clinical-policy/stroke/>

⁷⁶ <https://www.england.nhs.uk/wp-content/uploads/2019/05/Mechanical-thrombectomy-for-acute-ischaemic-stroke-ERRATA-29-05-19.pdf>

⁷⁷ Rothwell PM, et al; Early use of Existing Preventive Strategies for Stroke (EXPRESS) study. Effect of urgent treatment of transient ischaemic attack and minor stroke on early recurrent stroke (EXPRESS study): a prospective population-based sequential comparison. *Lancet*. 2007 Oct 20;370(9596):1432-42. doi: 10.1016/S0140-6736(07)61448-2.

appropriate diagnostics and treatment, occurs with a stroke specialist within 24 hours.

All three hospitals offer a Monday to Friday TIA service at present, with Saturday and Sunday access for all of BNSSG being provided by neurology at Southmead Hospital. The current activity levels at each hospital site can be seen in Table 15 below. Patients with TIA are also frequently seen by stroke specialists in the Emergency Departments (ED) and have their investigations and treatment started which negates the need for a TIA clinic referral; this activity is therefore not visible in the outpatient clinic data presented.

Table 15 - 18/19 TIA Outpatient Activity

	NBT	UHBW	Weston	Total
TIA outpatient activity	1,121	772	641	2,534

A number of challenges exist with the current clinic configuration and arrangements for diagnostics. These vary between providers and include:

- Limited vascular ultrasound availability in Weston Hospital (currently 3 days per week only)
- Limited access to same day MRI in Weston and BRI, particularly at the weekend
- Delay receiving results of prolonged cardiac monitoring at Weston Hospital
- Some patients, particularly from more remote areas and high risk communities face challenges travelling to the Southmead Hospital weekend clinic and so do not attend and miss out on timely treatment.

The Clinical Design and Delivery Group have reviewed the options to improve the TIA outpatient service in the context of the proposed changes to hospital care, and to make the most of the specialist stroke workforce needed across the care pathway.

The proposal for future service provision from an integrated BNSSG stroke and TIA service is designed to deliver patient access to specialist assessment, appropriate diagnostics and treatment within 24 hours of their symptoms whenever and wherever these occur.

In order to achieve this, a central referral hub is recommended, which can match patient demand to clinic availability and ensure consistent monitoring of activity and access across BNSSG. The centralised TIA coordinator would accept referrals from GP's, paramedics and ED departments across BNSSG and its border areas and would arrange appointments across the three hospitals. Clinical triage by telephone or video, which has proven effective during the Covid-19 response, would help direct patients to the most appropriate resource which in some cases may not be a face to face TIA clinic appointment.

The following diagnostic support would be required to be available on the day, (not all referrals will require these):

- MRI
- CT e.g. If MRI contraindicated or not tolerated

- Carotid imaging: Vascular ultrasound, MR Angiogram or CT Angiogram
- ECG
- Blood tests
- Prolonged cardiac monitoring

In addition:

- ECHO <48hours if non AF cardiac emboli suspected (mural thrombus or endocarditis)
- Non-urgent ECHO and bubble contrast Echo available.

The proposed operating model for TIA clinic delivery across the sites can be seen below:

Southmead Hospital

- Same Day Emergency Care (SDEC) for patients presenting or conveyed to Southmead Hospital Emergency Department with a TIA 7 days a week.
- Continued GP, ED and paramedic referral clinic for BNSSG area on Saturday and Sunday

Bristol Royal Infirmary

- Monday to Friday service primarily for Bristol and South Gloucestershire area GP, BRI ED and paramedic referrals.

Weston Hospital

- Full 5 day service primarily for North Somerset GP, ED and paramedic referrals with remote advice from the HASU on days when a stroke consultant is not available on site.
- At weekends patients unable to travel to Southmead Hospital TIA clinic could attend Weston with remote consultation provided by the HASU team with on-site facilitation. Weekend MRI and vascular ultrasound are unlikely to be economically viable to provide if only used for TIA but other diagnostics and treatment would be available.

This model may evolve, responding to changes in the neurology service and availability of diagnostic support services.

All patients diagnosed with a TIA would be given secondary prevention medication to take home from the clinic, which will require pharmacy support, together with written information and advice.

The experience and outcomes for all patients referred to the service would be monitored as part of a governance process. This would include, amongst other measures, any incidence of stroke in patients referred to the service.

10.4 A “Single Stroke Workforce”

BNSSG aspires to have a single workforce across all aspects of a patient’s pathway. This will enable greater career opportunity, training and education and satisfaction

for our valuable stroke workforce and in turn continuity of patient care as well as equality of treatment.

The workforce will be recruited and retained in a resilient way to deliver the patient care required in supporting patients through their pathway in an optimum manner. They will work in a way that makes the most efficient use of the time and skills of the workforce e.g. reducing time for qualified professionals completing tasks that could more appropriately be delivered by other members of the team or through digital solutions and/or improved processes

The service will enable the development of existing staff and the development and delivery of career pathways and new roles such as Physicians Associates and Advanced Clinical Practitioners to compliment the workforce needs.

Measurable benefits will include some or all of the following:

- Improved attraction to careers in stroke services, leading to vacancy rate reduction and appropriate staffing levels and skills to meet service specification and deliver the best quality treatment, care and support
- Improved development, education and training for staff delivering stroke care, including consistency of the level of education and training available and equality of access across the whole workforce
- Development of career pathways and opportunities across the stroke pathway
- A reduction in avoidable temporary staffing levels and costs (either through bank or agency)
- Improved sickness levels
- Improved staff satisfaction and engagement levels, leading to improved retention rates

10.4.1 Options to deliver a 'One Stroke workforce'

There are a number of options associated with the delivery of one stroke workforce across the BNSSG system. All of which have benefits that will be explored in more detail by the workforce sub group as the programme progresses. The following options are identified below:

- **Transfer (TUPE)**
 - Staff all transferred to a single employer who then manages the workforce for the whole pathway
 - Staff transferred to more than one employer, each of which represents a defined part of the patient pathway e.g. Immediate/acute inpatient care and community provision. Each employer then manages the workforce for that part of the pathway
- **Hosting (Workforce sharing agreement)**
 - Staff are employed by a single organisation and managed accordingly
 - Service Level Agreements with provision of service centrally with delivery locally with SLA's in place
- **Secondments**

- These should be for a fixed period. It is therefore unlikely to be a main approach for all workforce as the needs are likely to be ongoing on the whole for workforce delivery in local areas.
- **Rotations**
 - This could work for some roles where staff work across differing aspects of the patient pathway (e.g. between HASU and ASU) and where skill sets determine viability. Rotational also support career development and education and training.

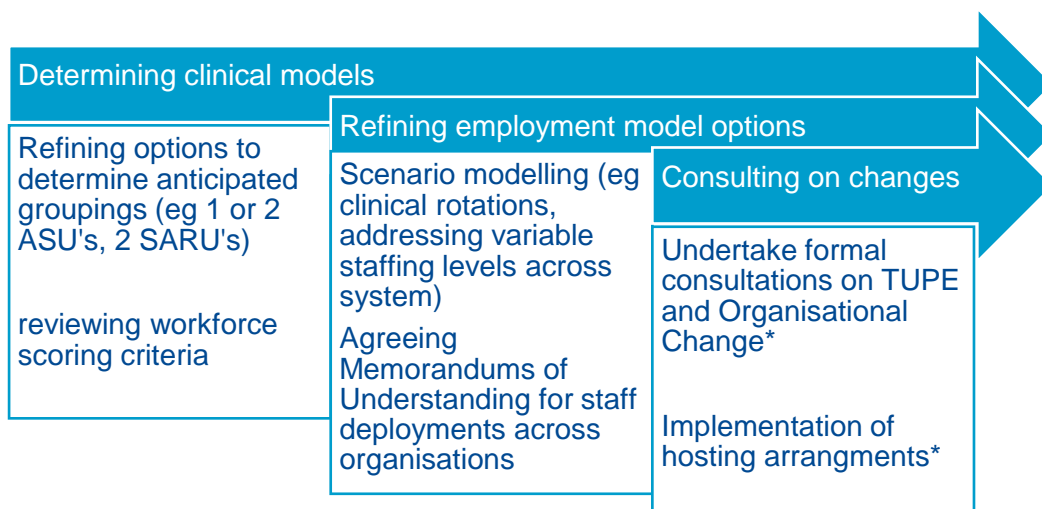
The single stroke workforce will operationally align to the specialty of stroke but will operate across multiple organisations where appropriate (e.g. Acute and Community providers). How this workforce will operate as a single workforce will be achieved through:

- Have a clearly defined governance, leadership and employment model (to be defined through the programme, see below)
- The alignment and integration of recruitment efforts (i.e. integrated and joint recruitment plans)
- Pan-BNSSG development plans (i.e. stroke competencies/education framework)
- Inter organisational rotational posts
- Multi setting working in appropriate roles
- Deployment of a consistent Employee Value Proposition across BNSSG

Figure 35 below outlines the journey to delivering the single stroke workforce across the 3 main stages between January 2021 and Summer 2022, following the final Decision Making Business Case.

At each stage approval will be obtained through the Stroke Programme board in determining options and approach.

Figure 35 - Journey towards delivering a single stroke workforce



*Final processes TBC following decision making process

10.4.2 Workforce modelling

The total workforce requirements across the stroke pathway have been modelled with the staffing ratios informed by and referenced against national guidelines (e.g. Getting It Right First Time (GIRFT)⁷⁸ & British Association of Stroke Physicians (BASP) Consultant workforce recommendations and Royal College Physicians (RCP) 2016 guidelines⁷⁹), against Option 1 and Option 2 which provides an indicative position against the supply and demand represented at WTE across the different staff groups within the acute settings.

Staff group	Recommended levels	Proposed models	Current delivery	Comments
Ward Nursing	RCP standard for HASU : 2.9wte / Bed @ 80:20 registered / Unregistered	2.7wte / Bed 80:20 registered / unregistered	HASU staffing levels for existing Acute beds in NBT.	Following Nursing review against NBT Safe Staffing levels & local acuity
	RCP standard for ASU : 1.35 / Bed @ 65:35 registered / Unregistered	Option 1: 1.34wte / Bed 65:35 registered / unregistered Option2: 1.34wte / Bed 76:24 registered / unregistered	ASU staffing levels for beds in NBT, UHB & Weston but lower skill mix (ie 50:50)	Following Nursing review against NBT Safe Staffing levels & local acuity
	SSARU : No national standards	1.8wte / Bed 40:60 registered / unregistered	ASU levels within SARU units – SBCH & Weston but lower skill mic (ie (50:50))	Following Nursing review against NBT Safe Staffing levels & local acuity
Consultants	BASP recommended staffing for approx. 1700 Strokes (19 HASU, 52ASU/Rehab): 103 DCC (ie 12.75 Consultants)	13 Consultants across delivering services across pathway Achievement of metrics for staffing level	9.6 Consultants. No weekend ward rounds at BRI or Weston. Once daily wk/end ward rounds at Southmead.	Staffing determined following Clinical Design Group assessments

⁷⁸ [Stroke - Getting It Right First Time - GIRFT](#)

⁷⁹ [Stroke guidelines | RCP London](#)

		ratios	No official designated HASU Centre.	
	<p>BASP standard for HASU: 24/7 availability; minimum 6 thrombolysis trained physicians on rota</p> <p>(8am-8pm, 7 days a week) for 2 consultants</p> <p>Twice daily ward rounds</p>	Consultant rota of 13 staff achieves standard through modelled staff requirements	<p>Standards achieved for existing HASU level beds in NBT (ie 10DCC / wk for 12Beds)</p> <p>Achieved currently during the week at BRI & Weston. 7 day in Southmead</p>	Staffing determined following Clinical Design Group assessments
	<p>BASP standard for ASU: Consultant led ward round 5 days/week</p> <p>2x WR per day M-F, 2 WR'S over w/e</p>	Achieves standard through modelled staff requirements for 7 days/week		Staffing determined following Clinical Design Group assessment
	<p>SSARU: Inpatient rehab and ESD/Community 10 DCC's</p> <p>includes MDT meetings/family meetings and 2 WR's per week</p>	1.1 Consultants to deliver across both SSARU sites	Consultant cover provided across SBCH, Weston & Southmead where P2 beds are utilised.	
'Other Medical'	No formal standards set out	Daytime cover: Upscaling existing staffing models for Jnr Doctors across increased bed base & different allocation of bed use on ratio of:	<p>Staffing allocated by</p> <p>1:6 Hyperacute 1:10 Acute/Rehab</p> <p>OOH: Cover provided by general medical on call @ BRI and Weston.</p>	Determined through clinical evaluation

		1:6 HASU 1:10 ASU OOH: Dedicated Stroke specific 24/7workforce		
OT	HASU: 0.95wte / 5 Beds [across 7 days] ASU: 1.13wte / 5 beds [7days] Sub acute / Community: No formal guidelines.	HASU: 5.5wte ASU: 6.5wte Sub acute Staffing levels aligned to ASU levels Community: Informed by ESD levels and Benchmarked against similar services	Acute: for OT/Physio & SLT SSNAP & National Standards 45 minutes of therapy input [5 out of 7 days & NBT Only] 24 hr / 72hr initial assessments Formal swallow assessments within 72 hrs of admission [SLT] Facilitation of patient flow across 7 days through pathway Sub-acute: 45 minutes therapy [as above] Facilitation of patient flow across 7	Determined through clinical evaluation
Physiotherapy	HASU: 1.02wte / 5 Beds (7 days) ASU: 1.18wte / 5 beds [7days] Sub acute / Community: No formal guidelines.	HASU: 5.5wte ASU: 6.5wte Sub acute Staffing levels aligned to ASU levels Community: Informed by ESD levels and Benchmarked against similar services		Determined through clinical evaluation
SLT	HASU: 0.95wte /	HASU:		Determined

	<p>10 Beds [7days]</p> <p>ASU: 1.13wte / 10 beds [7 days]</p> <p>Sub acute / Community: No formal guidelines.</p>	<p>2.21wte</p> <p>ASU: 2.29</p> <p>Sub acute Staffing levels aligned to ASU levels</p> <p>Community: Informed by ESD levels and Benchmarked against similar services</p>	<p>days through pathway</p> <p>Community ESD team delivers against standards in line with ISDN performance expectations</p>	<p>through clinical evaluation</p>
Dietetics	<p>HASU & ASU: 0.15wte / 5 beds</p> <p>Sub acute / Community: No formal guidelines.</p>	<p>HASU & ASU: 2.00wte</p> <p>Sub acute Staffing levels aligned to ASU levels</p> <p>Community: Informed by ESD levels and Benchmarked against similar services</p>	<p>Applicable patients screened for nutrition and seen by a dietitian by discharge</p> <p>Sub acute Minimal current service delivery</p> <p>Community ESD meeting ISDN standards</p>	<p>Determined through clinical evaluation</p>
Psychology	<p>HASU & ASU: 0.20wte / 5 beds</p> <p>SSARU / Community: No formal guidelines.</p>	<p>HASU: 1.1wte</p> <p>ASU: 0.35wte</p> <p>Sub acute 2.1wte</p> <p>Community: 3.0wte Informed by</p>	<p>HASU & ASU: 0.4wte across Acute bed base</p> <p>0.4wte SBCH</p> <p>Sub acute & Community No dedicated Stroke support. Provision</p>	<p>Determined through clinical evaluation</p>

		ESD levels and Benchmarked against similar services	through general outpatients	
Administration	No Standards set for any element of the pathway	<p>HASU & ASU: Staffing determined through assessment of admin : consultant ratios and new pathway requirements (eg coordination roles)</p> <p>Increased management requirement across HASU</p> <p>Sub-acute & Community: Staffing determined through assessment of admin : and unit/locality ratios and new pathway requirements (eg coordination roles)</p>	Ward admin and management oversight within specialty	Determined through management evaluation

The proposed staffing levels meet the national guidance for “Safer staffing levels”, which is the tool utilised operationally by both NBT and UHBW in determining the staffing requirements based on patient acuity. However, the levels do vary slightly from Royal College of Physicians stroke staffing guidance in two areas: Nursing staffing for HASU and ASU, which can be seen in rows 2 and 3 of the table above.

Following repeated scrutiny and revision throughout the clinical design process and modelling for finances and patient flow, the staffing ratios were determined through engagement with clinical and operational lead staff. It has been confirmed that the proposed staffing levels will appropriately meet the needs of the patients within the Hyperacute and acute locations identified.

The modelling considerations and workforce action plans account for all five aspects of the HEE STAR model⁸⁰ and have informed the requirements for the Stroke HIT Education and Training group, as well as the BNSSG Learning Academy.

Theme (HEE Star Model)	Key deliverables	Progress / Milestones
Supply	<ul style="list-style-type: none"> Ensuring workforce supply is identified and staffing risks mitigated across Acute and ICSS patient pathway Developing plans for future supply 	<ul style="list-style-type: none"> Clear identification of gap between current workforce model and future requirement Collaborative Consultant Recruitment Agreed Nurse acute recruitment plans Consultant pipeline mapping (ie 3 CCT completions in 2022 locally)
Upskilling	<ul style="list-style-type: none"> Development plans within existing roles Engagement of RCN Stroke Career Framework Development of Competency Framework Development plans for PA's ANPs and ACP in place Voluntary Sector Key roles Band 4 Development Trainee Nurse Associates 	<ul style="list-style-type: none"> Links with BNSSG ACP lead for regional consistency Development of Competency Framework in Stroke HiT Education group Clinical lead for PA, ANP and ACP (within NBT) identified ANP competencies developed Strong links with UoB & UWE through placement programmes (including psychology students)
New Roles	<ul style="list-style-type: none"> Expansion of ANP roles within Medical rotas Expansion of AP role within ward Nursing Development of ACP model 	<ul style="list-style-type: none"> Clinical time allocated to role developments within NBT ACP role development work initiated. 3 Stroke PA posts in place
New ways of working	<ul style="list-style-type: none"> Inter-organisational rotations developed New clinical rotas and working across pathways Virtual / remote delivery of patient care 	<ul style="list-style-type: none"> Outline approaches developed as part of workforce planning Adoption of technology
Leadership	<ul style="list-style-type: none"> Development of leadership structures aligned to patient pathways Clear Governance structure in place for operational delivery of model 	<ul style="list-style-type: none"> Structures being developed aligned to models for Programme Board approval and linking to ISDN and Stroke HiT structures.

⁸⁰ <https://www.hee.nhs.uk/our-work/hee-star>

Figure 36 to Figure 38 clearly demonstrates that, across a number of key staff groups, demand exceeds supply meaning there will need to be a number of key enablers to deliver the proposals listed. However the nursing vacancy rate has reduced over the 18 months to January 2021 (from 20-35% to 5-15%).

For the SSARUs, therapy provision will across 7 days, in line with the acute service. This will support patient flow and discharge across the patient pathway. Expansion of the therapy support available to stroke patients represents a significant increase in staffing in comparison to existing levels. Supply in this area is generally adequate as stroke is a popular specialty to recruit therapists into.

Through the development of the revised pathways between acute and sub-acute it is critical to ensure that there is a protected specialist workforce to enable transition between acute and community. This is currently delivered through the Early Supported Discharge (ESD) team. This aspect of service delivery will continue, and has been modelled as part of the ICSS workforce, bridging the gap between care in hospital and care at home, supporting improved patient flow and ongoing rehabilitation.

Figure 36 - Workforce Supply & Demand for Acute Provision (Option 1)

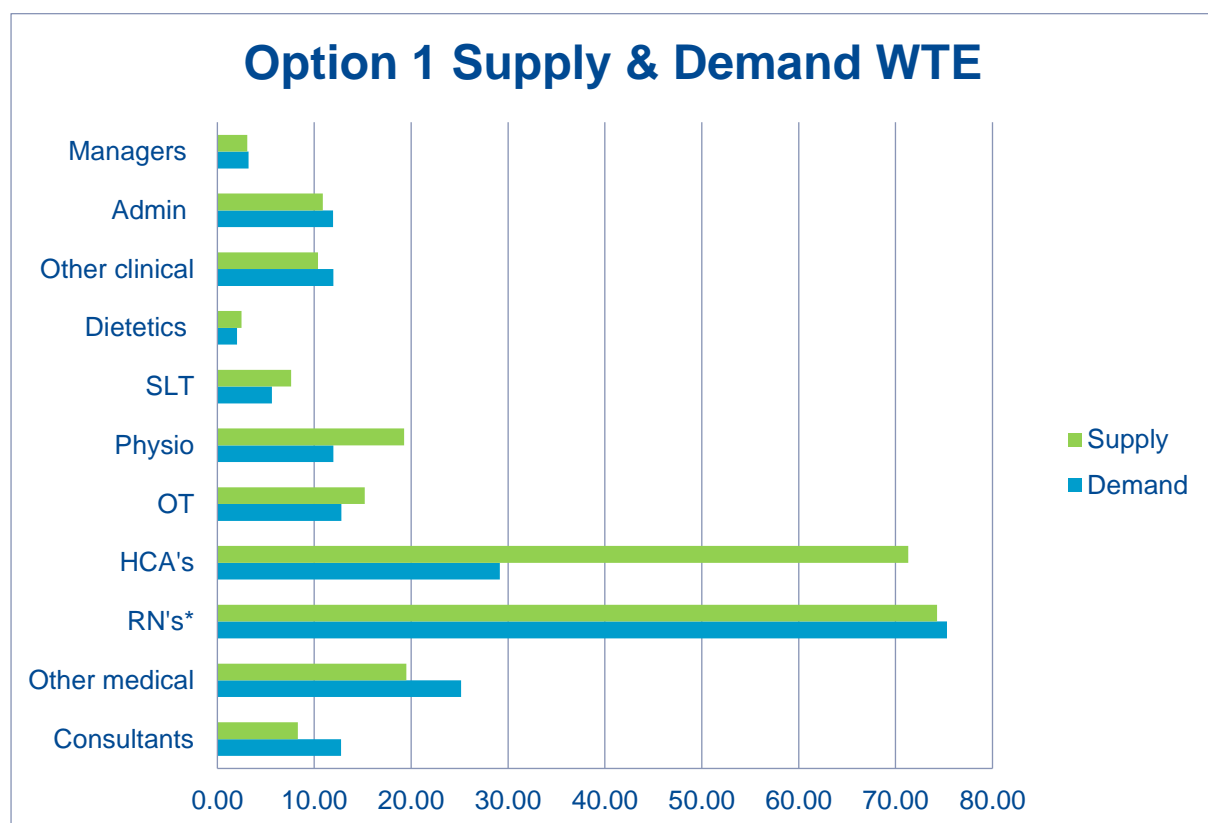


Figure 37 - Workforce Supply & Demand for Acute Provision (Option 2)

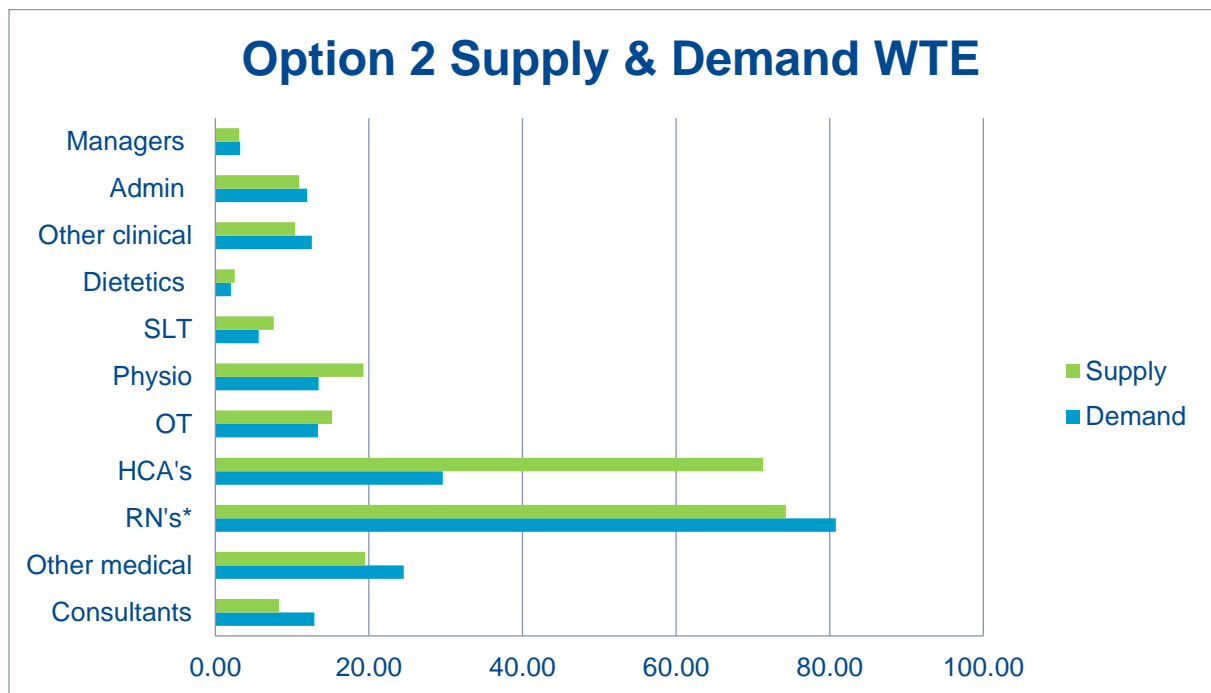
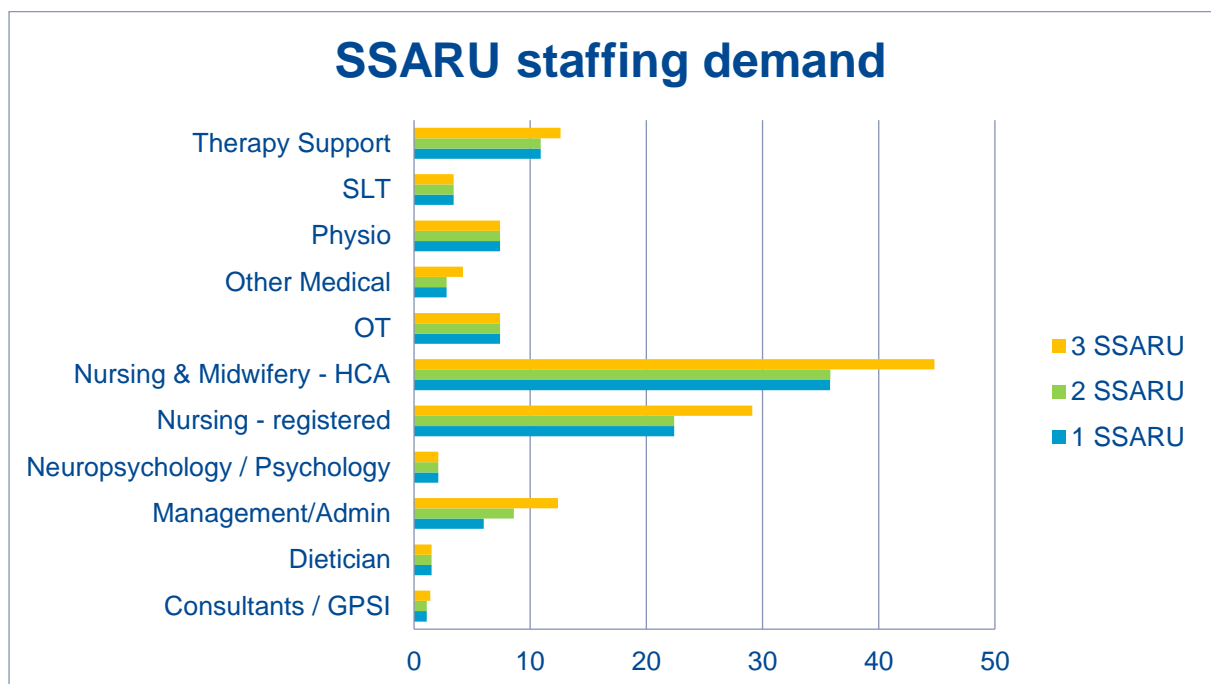


Figure 38 - Staffing demand for 3 SSARU, 2 SSARU and 1 SSARU variations



In relation to the sub-acute workforce supply, a key feature of the approach will be to align recruitment approaches across the pathway in order to ensure an integrated workforce supply route. The table below illustrates the top workforce risks with associated mitigations.

Table 16 - Top workforce risks with associated mitigations

Risk	Mitigation
Staffing availability for SSARU	<ul style="list-style-type: none"> • Live recruitment being undertaken in the community to pre-empt workforce shortfalls. • Mapping staffing against main options following financial approvals and options refinements
Clarity for ESD component aspects of ICSS	<ul style="list-style-type: none"> • Task and Finish group in place to address key workforce and operating model components over winter/spring 2021
North Somerset staffing supply for SSARU & ICSS prior to implementation of new models	<ul style="list-style-type: none"> • Dependent on existing acute staffing transferring. • Prioritisation of recruitment activity to support key delivery of programme and enable patient flow

10.4.3 Key enablers

In order to align the workforce across the system, it is important that there is a single workforce supply plan across the pathway with clear visibility of new role development, education pathways, vacancies and targets. This is being worked on by a workforce sub group and will continue to develop as the programme progresses to the decision making phase.

The following enablers have been identified:

- A robust workforce supply plan, this may require dedicated resource to deliver a bespoke plan for stroke services
- Healthier Together branding and the development of an identity for BNSSG stroke services should be clearly articulated to ensure a clear 'offer' to candidates and staff as part of the Employee Value Proposition (EVP)
- Through the development of both HASU status and application of Thrombectomy within recruitment marketing, the feedback from existing candidates from recruitment campaigns in 2019/20 indicate this is a key attraction for working within Stroke.
- Financial adaptability
 - Ensure appropriate cross-charging arrangements are in place for temporary staffing requirements or funding considerations.
- Alignment of pay & reward
 - Ensure that aspects such as Bank rates, Recruitment and Retention premia (RRP) are aligned to avoid inequality and destabilisation.
- Specific features of recruitment planning include the adoption of an integrated Employee Value Proposition across BNSSG aligned to stroke careers (see Figure 39)

Figure 39 - Healthier Together Employee Value Proposition



10.4.4 Workforce Risks

A number of workforce risks have been identified through the workforce programme, which are addressed both through the actions stated within this document. Risks associated with workforce are regularly reviewed through the BNSSG Stroke Programme Board and workforce group to ensure the mitigations are effective and working to address risks that have been identified by the programme.

Description	Mitigations
<p>There is a risk that in developing options for service change, sustainability of existing services may be compromised as staff recruitment and retention is impacted leading to service failures/increased cost</p>	<p>Acute</p> <ul style="list-style-type: none"> -Workforce Group is developing cross system practices to support recruitment and retention of a whole system stroke workforce (eg Consultant joint appointments). -Comms and engagement Group established in new structure will support improved staff and stakeholder communication on progress of clinical options development -Links made between STP Workforce programme and stroke Workforce Group. - Nursing vacancy rate has reduced over the 18 months to January 2021 (from 20-35% to 5-15%) <p>Sub Acute - Aligning communications of community procurement and impacts of Stroke programme intentions to provide assurance to staff</p>
<p>There is a risk there will not be sufficient workforce to deliver the redesigned stroke care pathway or to deliver current services during the transition process</p>	<ul style="list-style-type: none"> -Workforce group will design, model and plan the Workforce required to deliver the redesign for stroke care across BNSSG, including the development a composite Workforce approach incorporating and designing new roles based on Workforce competency requirements. -Workforce group will develop cross system practices to support recruitment and retention of a whole system stroke workforce. - Integrated resourcing plans developed (eg Joint Consultant appointments and joint recruitment events) -Comms and engagement group established in new structure will support improved staff and stakeholder communication on progress of clinical options development -Links made between STP Workforce programme and stroke Workforce Group.
<p>There is a risk that capacity planning assumptions are inaccurate which leads to capacity deficits in the future state which may result in patients not receiving timely access to stroke care</p>	<ul style="list-style-type: none"> -Detailed modelling exercise drawing on validated data sources -Stochastic model published and peer reviewed -Clinical oversight of all planning assumptions through the clinical design group
<p>There is a risk that workforce and clinical skills required to manage patients on non-stroke pathways (e.g. Acquired Brain Injury) will be lost at the BRI and Weston Hospital as this is currently provided by UHBW stroke team.</p>	<ul style="list-style-type: none"> -Work completed to identify and quantify non-stroke pathways currently managed by UHBW stroke team with operational pathways described between UHBW and NBT for appropriate clinical support -Incorporated into role of in-reach stroke team OR -Delivered by alternative UHBW staff group with adequate training. - Stroke HIT Education group development for BNSSG wide Stroke Framework.

There is a risk that if in-reach therapy is not on-site at the BRI and Weston Hospital, patients' would not receive timely therapy interventions which are paramount to improving outcomes (e.g. swallow assessment, positioning and handling assessment and advice).

-On site therapy workforce described for BRI in Option 1 to care for stroke patients that cannot be transferred to the HASU
-Staff rotational through hospital sites
-Response time standards outlined in Service Level Agreement.

10.4.5 Impact of the changes on staff

The changes proposed to the stroke service configuration represent a significant change to staff working within the existing service. Chapter 4 outlines the engagement that has been undertaken with staff working within the service and this process will continue throughout the duration of BNSSG stroke programme. There is a strong commitment from the Stroke Programme Board to ensure effective communication, and, whilst this has been challenging during the peaks of the Covid-19 pandemic, information from current stroke staff has supported the design of the clinical model.

The impact on staff as a result of the changes will vary depending on their current place of work and interest. For example, a therapist that specialises in acute stroke care in Weston Hospital may wish to consider moving to work within Southmead Hospital, or the BRI in Option 2, if they want to continue to deliver acute care. If that individual wanted to continue to work in stroke at Weston Hospital but was able to shift their specialism towards rehabilitation, opportunity would exist for that person to maintain their current place of work.

Individual staff scenarios will vary considerably across the stroke service and the BNSSG Stroke Programme will, through the health system management teams and workforce leads, work to support all staff through the change process. Retaining existing staff is a key objective of the reconfiguration programme and success in this area will lead to a successful implementation programme across BNSSG.

Travel times between the BNSSG sites that are under consideration for the provision of stroke care can be seen in Table 17. These are the distances between existing hospital locations. Individual travel times will be determined based on specific location of residence. Any proposed change in base will be discussed with staff as part of the ongoing engagement. Formal staff consultations will be required as part of organisational changes at the point the programme moves into implementation.

Table 17 - Distances between existing/planned hospital locations in BNSSG

Distance in Miles	Southmead Hospital	BRI	South Bristol Community Hospital	Weston Hospital	Frenchay Site
Southmead Hospital	0	3.2	9.5	26.7	4.4
BRI	3.2	0	5.7	23.4	5.6
South Bristol Community Hospital	9.5	5.7	0	21.1	10.0
Weston Hospital	26.7	23.4	21.1	0	31.0
Frenchay Site	4.4	5.6	10.0	31.0	

10.4.6 Workforce Benefits

Resilient Workforce

Developing a workforce which is resilient and sustainable will lead to quantifiable improvements in patient care and experience.

Through the proposed development of Stroke Services in BNSSG a sense of connectivity between care locations would be enhanced, as there would be a clearer sense of the patient journey and visibility of the impact of interventions, such as Thrombectomy, into the overall patient outcomes. The findings of a 2019 research study by University of Brighton into subjective accounts of staff within acute stroke units, concluded that their sense of place and connectivity to their patients and work, was a factor in overall morale⁸¹.

A local example of improved resilience following service redesign and centralisation can be seen following the centralisation of Pathology services within BNSSG. Following the reconfiguration, both the vacancy rate and staff turnover rate reduced (post implementation of Severn Pathology) positively impacting on overall service delivery.

Reviewing ways of working, improving processes and utilising digital solutions and enhancements will enable staff to work in a way that makes the most efficient use of their time and skills e.g. reducing time for qualified professionals completing tasks that could more appropriately be delivered by other members of the team

Recruitment & Retention

The development of HASU status and the application of Thrombectomy within recruitment marketing is expected to support recruitment and retention of specialist stroke staff in the BNSSG area. Feedback from existing candidates from recruitment

⁸¹ <https://research.brighton.ac.uk/en/publications/the-acute-stroke-unit-as-a-meaningful-space-the-lived-experience->

campaigns in 2019/20 indicates this is a key attraction for working within the BNSSG Stroke Service. This was also evidenced in an increase of the quantity of high calibre Advanced Nurse Practitioner candidate applications within the BNSSG Stroke Service for vacancies in 2020. Coordinated recruitment, temporary staffing rates, Recruitment and Retention Premia, and a streamlined approach between organisations will ensure that there are not inter-trust pay inconsistencies, which can impact on recruitment, retention and temporary staffing availability.

Joint Consultant posts are already being developed between NBT and UHBW to ensure that candidates can be recruited to deliver existing services and working towards delivering future requirements aligned to these ambitions.

Within the Consultant recruitment plans, ongoing contact strategies are maintained with medical staff who are due to complete their CCT as part of longer term recruitment plans. The service is therefore working with a Consultant pipeline of 3 who are due to complete this during 2022, aligning to our recruitment requirements in this low-supply area.

Workforce development

The development of existing and new roles such as Advanced Clinical Practitioners and Physicians Associates will develop new career pathways to support staffing resilience and in turn increase staff retention, engagement and motivation.

In developing a singular leadership structure, staffing allocation can be operationally managed to provide a more responsive service to variable service demands and within different settings of stroke care delivery.

The development of harmonised staffing rotas will support the above aim, which is not possible when services are delivered separately. This has been identified as a key benefit within the Kent and Medway Stroke reconfiguration service, and is detailed within their consultation documentation⁸².

Having a defined development, education and training offer for staff delivering stroke care, will improve the consistency of the level of education and training available and equality of access across the whole workforce

The BNSSG Stroke Framework is designed to describe and support the development of the skills and knowledge that all health care professionals and support staff require to deliver high quality care as part of the BNSSG Stroke Pathway in both the hospital and community setting.

Training and skills acquisition will be achieved through multiple sources but will include the STARS Competencies, local training events (eg Starting out in Stroke), and Making Every Contact Count (MECC).

⁸² https://kentandmedway.nhs.uk/wp-content/uploads/2018/02/KMStrokeConsultationDocument_final_02022018.pdf

In relation to Thrombectomy skill acquisition, training would be required and internally delivered through existing expertise in the assessment and management of patients for a Thrombectomy, both remote cases form a large geographical area and internal presentations at NBT. This will include:

- Having sufficient knowledge base of current national guidance NICE (and the relevant trials on which this is based) to be able to justify rationale for proceeding or not proceeding to Thrombectomy and to enable MDT discussions with INR.
- Familiarisation of pathway from front door to angio suite and post procedural care through shadowing current substantive acute stroke consultants for 2-4 weeks.
- Observation of thrombectomy calls and also under supervision working towards leading the whole team (ANP and SpR in a thrombectomy call).
- Awareness of complications of Thrombectomy and governance processes through which these complications are reviewed.
- Familiarisation with imaging systems and referral systems - Brainomix, Referapatient, 3DNET. Ideally attend simulation training and complete online CTA course.

Table 18 details the current specialist stroke workforce challenges that exist within BNSSG. It also describes how the proposals for change, and the recommendation that BNSSG to move to a single stroke workforce, will improve the challenges experienced.

Table 18 - Addressing Stroke workforce challenges through collaboration, alignment and coordination

Current workforce challenges	Proposed model anticipated improvements
<p>Registered Nursing recruitment challenges leading to vacancy rates of between 5%-15% across local acute settings</p>	<p>Through development of HASU services and opportunities for staff to support Thrombectomy interventions and associated patient outcomes, a greater candidate attraction and staff retention will be realised as these are key features of exciting developments within Stroke which are currently not consistently offered across BNSSG.</p> <p>International recruitment through collaborations with Yeovil Trust is already in place at NBT and UHBW has undertaken a similar programme for EU recruitment in 2020 which has proved successful to date. Additional funds are also being drawn down from NHS E/I in 2021 to support further international recruitment campaigns.</p>
<p>Consultant recruitment is challenging due to uncertainty of current Stroke provision in certain settings</p>	<p>Development of 'One Stroke Workforce' model incorporating multi-site rotas ensuring Consultant staff obtain experience and development across acute pathway and Thrombectomy will attract candidates and support staff development. This approach includes coordinated recruitment approaches between acute</p>

	<p>providers.</p> <p>International recruitment has already been undertaken for medical appointments and will be further utilised along with coordination of recruitment and retention incentives where appropriate.</p>
<p>Inconsistent recruitment and retention approaches and incentives currently in place across Acute Trusts</p>	<p>Through aligned recruitment approaches across organisations, an improved candidate offer can be identified ensuring better return on investment from recruitment events which can be supported through associated communications and branding.</p> <p>Aligned and standardised approach to recruitment and retention incentives will ensure a consistent offer can be made to staff in hard to fill posts can be made which will support both recruitment and retention across BNSSG</p>
<p>Staffing requirements determined within individual settings</p>	<p>Through the development of the concept of a single Stroke workforce, greater flexibility can be applied to approaches for recruitment, staff development, staffing allocations and staff transfers.</p>
<p>Staff development opportunities are not currently coordinated across BNSSG</p>	<p>Through the Stroke Health Integration Team education group all staff working across the region will have access to contemporary holistic stroke education.</p> <p>This group will develop a career framework taking account of national and international best practice to support professional development within Stroke and working in partnership with voluntary sector organisations.</p>
<p>Some career development opportunities are currently limited</p>	<p>The development and expansion of the role of Advanced Clinical Practitioner (ACP) and Physicians Associate (PA) as part of the medical rotas will both address potential workforce gaps as well as provide additional career routes for existing and new staff within BNSSG which will support recruitment and retention of staff.</p> <p>These roles can be developed from existing staff as well as through recruitment of staff nationally.</p> <p>Through the development of therapy rotations both within acute settings and between acute and sub-acute / community settings, a great breadth of skills and specialist expertise will be consistently achieved which will support retention as well as delivery of consistent best practice for patients.</p>

10.5 Digital Advancements

Digital healthcare refers to a combination of medical science, delivery systems and emerging information technologies for the generation, structure, storage and analysis of health data and the extraction and presentation of useful and actionable insight from it.

The use of digital is being reviewed nationally and regionally across all aspects of the stroke pathway, NHSEI are in the process of developing specifications required with direct support from the regional NHSEI Digital Team.

Through linking with the regional team, BNSSG are collaborating to incorporate planned advancements in:

- **Telemedicine** - Pre-hospitalisation visual alert to provide remote stroke triage in the patient's home, identifying mimic strokes and TIAs.
- **Artificial intelligence** – to speed up image interpretation remotely across networks and as a diagnostic support tool.
- **MDT collaboration** - videoconferencing of diagnostic imaging
- **Telerehab and mobile devices** – The use of video-calls to deliver a large range of rehabilitation intervention and hand-held devices for the use of Apps to enhance rehabilitation
- **Robotics** – It is possible that use of robotics devices can improve outcomes for people with stroke, this is being explored.

These advancements sit alongside and support the proposals for change. It should be noted that assumptions regarding activity, workforce or financial implications as a result of technological advancements, have not been built into the proposals, nor have the potential benefits to the service been included at this stage. The proposed changes to the stroke service can be completed using existing systems and as the benefit and cost are appraised, digital enhancements will be brought into the planning assumptions to support the reconfiguration process.

It is not expected that the cost implication of any of the digital opportunities will be significant or prohibitive to the progress of the proposals. It should be noted that all digital elements are linked to the Healthier Together Digital Delivery Board, which is the recognised governance route for all digital developments within the ICS.

10.5.1 Telemedicine

Telemedicine and telehealth consist of a network of audio-visual communication and computer systems for delivery of clinical services and make use of the advances in high speed data transfer and data security to provide remote centres with the expertise usually only available in urban centres, greatly expanding the potential coverage of the stroke care network and improving access to high-quality stroke care with optimal patient safety and data protection.

Telemedicine has applications in the pre hospitalisation, acute and post-acute phases of stroke care.

NHSEI are exploring **pre-hospitalisation visual alerts** to provide remote stroke triage in the patient's home, identifying mimic strokes and TIAs. This will be app-based videoconferencing with 3G, 4G and 5G connectivity, across multiple devices solution (e.g. tablets, laptops, webcams etc) as well as access to the on-call stroke network rota and enable the paramedic and Consultant to 'meet' in a virtual consulting room. The stroke programme will link closely with developments to ensure local roll-out when available.

In the acute phase, there is evidence suggesting that telemedicine networks enable stroke-specific procedures to be performed safely by less experienced clinicians under the guidance of stroke medicine specialists. Studies have shown that telemedicine can lead to earlier initiation of stroke therapy interventions such as thrombolysis. The effectiveness and safety this procedure in non HASU sites in a telemedicine network for stroke, has been shown to be comparable with that achieved in dedicated stroke centres.

Community hospitals benefiting from telemedicine are also able to recognise earlier patients requiring advanced care, thus reducing delays in transfer times to comprehensive centres. Telemedicine networks can, in addition, being used to select and enrol patients into acute stroke trials, allowing for a more representative sample of the population as well as increased recruitment.

For post-acute stroke care, studies evaluating the use of telemedicine for stroke physical and cognitive rehabilitation have failed to show a difference between tele-rehabilitation and face-to-face therapy, or have shown greater improvement on the tele-rehabilitation group.⁸³

10.5.2 Artificial intelligence

There has been a steadily growing interest in the applications of artificial intelligence (AI) to the clinical practice although use of this technology is not routinely used.

More detail is being explored at a national level, namely to speed up image interpretation remotely across networks.

The solution is planned to provide / enable:

- Timely sharing of images between key healthcare professionals within and across stroke networks to facilitate stroke decision-making;
- CE-marked tools for augmented decision support tools in real time to facilitate stroke decision-making across networks;
- Use of e-ASPECTS, CTA and CT Perfusion modules;
- Delivery via virtual machine to enable rapid implementation in response to COVID-19;
- Configuration of output images to a secure web user interface (with appropriate de-identification) and smart phone app as well as PACS or email;
- Web and app-based access;
- Expert stroke care 24-7 more easily, even if stroke consultants are in isolation and easier sharing of expertise across Trusts as needs demand.

⁸³ https://www.cochrane.org/CD010255/STROKE_telerehabilitation-services-stroke

Machine learning methods may be imminently applied to stroke diagnosis, management and prognostications. Recent studies have shown promising applications in fields such as Stroke recognition in the emergency department. A recent study showed that artificial neural networks (ANN) could be used to differentiate ischaemic strokes from stroke mimics; patient selection and outcome prediction, where ANNs have shown potential to predict outcomes in patients undergoing invasive interventions such as mechanical thrombectomy and carotid artery stenting. AI can also be used for Neuroimaging and has been demonstrated in population health management by providing a reliable method of predicting and forecasting the number of stroke recurrences and major cardiovascular events.

10.5.3 MDT collaboration

MDT collaboration across secondary and community care is already standard practice across BNSSG. As videoconferencing of diagnostic imaging becomes increasingly available, BNSSG aims to introduce a standardised solution to further broaden this collaboration virtually, across the network. This will enable greater access locally, to a specialist centralised workforce with the skills to interpret the diagnostic images.

Although telemedicine networks have an upfront implementation cost, they can lead to reduced direct and indirect costs for the health care system by helping to reduce length of hospital stay, and long-term disability.

10.5.4 TeleRehab and Apps

The technology for live-streaming of virtual classes or video calls for 1-to-1 virtual appoints, as well as Apps for smartphones has existed for some time and the use of these in rehabilitation care is not novel. However, there are specific issues that people with stroke have in relation to accessing these technologies. Some issues relate to digital exclusion and social isolation as well as basic practicality of connectivity. Other issues arise from the effect of stroke such as communication or cognitive impairments which make the use of these technologies difficult or impossible without support. The stroke programme is already drawing together clinicians and voices of people with lived experience of stroke to address these issues and improve the way that use of technology and its accessibility are assessed and promoted early on in the stroke recovery journey. This will continue to ensure that the newly reconfigured stroke services give the best possible opportunity for people with stroke to make the most of these technologies to aid their own recovery.

10.5.5 Robotics

The use of robot-assisted therapy, in particular for upper limb, is an emerging field of research and could help therapists to provide high-intensity, repetitive, and task-specific treatments based on neuro-plasticity theories. Evidence from a 2018 review suggested that robot-assisted rehabilitation can be effective in improving motor function recovery, particularly in chronic strokes. The Stroke Programme is already

drawing together clinicians to investigate this evidence and trial and discuss the use of different technologies in this way to guide proposals for what new equipment and technology is needed to deliver the very best stroke rehabilitation.

11 Activity planning and financial analysis

Health and Care System Leaders have a responsibility to ensure that planning for large scale service change is completed thoroughly and in partnership with each other, to ensure that proposals for change will function seamlessly between providers and that any knock-on implications are adequately accounted for. The BNSSG Stroke Programme has ensured that all partners in the Healthier Together system have been involved in the planning and developing the proposals for change. Where possible, recognised system capacity planning models have been used to ensure consistency of capacity planning work with other system-wide programmes, such as the “discharge to assess” capacity in the community required for Phase 3 of the Covid-19 response.

Detailed capacity planning has been undertaken that draws on baseline activity in 2018/19, considers population changes across BNSSG, and uses evidenced based planning assumptions (drawn from SSNAP and other data sources) to determine the future state bed and community care requirements under the proposed new model.

The planned capacity has been tested using a simulation model, developed in the local health system, which runs a year of care for the people of BNSSG to simulate how queues will form in the new pathway. This stochastic modelling helps to validate the capacity planning assumptions and enables the system leadership to take informed decisions about operational risk; the full reports from the modelling work completed by the BNSSG Stroke Programme can be seen in Appendix 10.

The detailed capacity planning for stroke care has driven the workforce requirements and resultant costing exercise to give an assessment of cost for the new model. This is set against the existing baseline position, which was the spend on stroke care in 2018/19 in BNSSG, to describe the change in cost to the system of implementing these proposals. The impact on the individual organisations and the commissioners is also presented and the programme has drawn on the support of the financial leadership within each of the organisations affected by the change to ensure that the proposed changes can be enacted, once fully agreed.

11.1 Summary of capacity and financial position

11.1.1 Capacity

The impact of the proposals on the total number of inpatient beds provided for stroke patients across the healthcare system can be seen in Table 19 below.

Table 19 - Stroke inpatient capacity – current state (2018/19) and future state

2018/19 Actual beds used					
	Weston	NBT	UHB (inc. SBCH)	Other	Total
Acute	6	31	14		51
Acute based Rehab	6	27	12	6	51
Total Beds	12	58	26	6	102
Community Stroke Care Contacts	11,340 (15 visits per patient)				
Future state beds predicted – Option 1b					
	Weston/ North Somerset	NBT/South Glous	UHB/ Bristol		Total
Acute		44			44
Community Rehab	42				42
Total Beds					86
Community Stroke Care Contacts	45,360 (60 visits per patient)				
Future state beds predicted – Option 2b					
	Weston/ North Somerset	NBT/South Glous	UHB/ Bristol		Total
Acute		36	9	0	45
Community Rehab	42				42
Total Beds					87
Community Stroke Care Contacts	45,360 (60 visits per patient)				

There is an overall reduction of 16 beds in Option 1 and 15 beds in Option 2 between the baseline provision and the proposed for the future state. This reduction in inpatient capacity is managed through a significant increase in out of hospital care for patients, which will be provided in their own home through the ICSS.

Detailed baseline information regarding the number of community visits provided per patient is not available because specialist community stroke support in the community is extremely variable at present. However, it has been estimated that in the 2018/19 baseline year, on average, patients received 15 visits following discharge. In the future state, patients will receive an average of 60 visits following discharge, which represents a considerable increase. It is this increased support in the home that reduces the overall need for inpatient care.

There is also a significant shift from acute hospital based bed provision to community beds in the future state. The baseline position includes 33 acute care beds at Weston and North Bristol that are occupied by patients who could be treated and supported in the community. A further six beds are purchased in other settings that will not be required in the future state. A total of 39 hospital beds are therefore relocated into community care settings as a result of the proposals for change.

The capacity provided within beds and in the ICSS has been used to generate the workforce requirements to deliver seamless care to patients for the entirety of the stroke pathway. The workforce model is described in Section 10.4.

Whilst these can be separated, the critical adjacency between the acute and community aspects of the pathway means that the programme has held the proposals for consultation and the ICSS service improvement as one. For example a 7 day community service is required to achieve the length of stay that will deliver the reduced number of acute bed.

11.1.2 Finance

The Baseline

In the baseline year of 2018/19, £29.7m was spent on acute and community stroke care in BNSSG. Costs were incurred across acute and community provision, as outlined in Table 14 below. The majority of the baseline funding was spent on acute care, with a smaller amount spent on rehabilitation beds, and the least on community care.

Baseline costs have been adjusted (indexed) from 2018/19 to 2020/21 prices to reflect the true basis of cost in 2020/21, significant service development and growth in activity.

The baseline costs have been adjusted to reflect a significant change in service that occurred in 2019/20 to invest in the provision of Mechanical Thrombectomy.

Mechanical Thrombectomy is a specialist treatment for patients who have had an Ischaemic stroke (a stroke caused by a blood vessel to the brain becoming blocked leading to death of brain cells) that is commissioned by NHS England from Neurosciences centres. An estimated 8,000 stroke patients a year nationally, are expected to benefit from this treatment which can significantly decrease the risk of long-term disability and also save millions of pounds in long term health and social care costs.

The development of Thrombectomy provision was authorised by NHS England in 2017/18 but recognised that full implementation would require a phased roll out to enable building of systems and training of workforce. Initial provision and service costs are within the 2018/19 baseline period. Additional investment of £1.7m was made in 2019/20 at NBT (the regional Neurosciences Centre) funded by national monies.

An estimate of growth in stroke activity of 3.6% per annum has been included as an adjustment held by the health system (£1.9m). This assumption is based on historic

growth seen in the numbers of people presenting with stroke symptoms for acute care and is consistent with the capacity modelling of the future options. The full makeup of the 2018/19 baseline position can be seen in Table 20

Table 20 - Baseline stroke healthcare costs (18/19 data indexed to 20/21 prices)

	NBT	UHBW	Sirona	Other	System	Total
	£m	£m	£m	£m	£m	£m
Acute & TIA	10.7	6.3				17.0
Thrombectomy	1.7					1.7
Rehab beds	4.6	2.8	0.5	0.2		8.1
Community			0.5	0.5		1.0
Activity growth					1.9	1.9
Total	17.0	9.0	1.0	0.7	1.9	29.7

Future Model

In the future model, acute spend will be split between HASU and ASU care and with significantly increased funds spent on stroke care in the community both on SSARU care and care at home (ICSS), in line with the National Stroke Service Model (Appendix 1).

As described in the proposals for change, activity will shift, to a model that delivers a short intensive spell of care in the HASU immediately following a stroke, through to a longer, more supported spell in the community, compared to the baseline provision. This will ensure that patients get clinically appropriate care, which is cost effective and better meets patient needs, avoiding long stays in hospital.

Two options are considered within this business case, Option 1b: 1 HASU, 1 ASU and 2 SARU plus ICSS and Option 2b: 1 HASU, 2 ASU and 2 SARU plus ICSS. In Option 1b an element of service provision will be retained at the BRI to support patients who are either too sick to transfer or also require specialisms (e.g. specialist cardiac care) provided by UHBW through the Bristol Heart Institute.

Table 21 shows how the costs increases for the future state service in both options, in comparison to the cost of the baseline service provision.

The primary drivers of this cost increase are the development of, and investment in, a dedicated integrated community stroke service, two sub-acute rehab units and increased skill mix in the acute and sub-acute workforce to support the flow of patients with greater acuity of need out of the acute bedbase.

Table 21 - Overall financial change associated with the proposals for change

	Baseline	Option 1b	Change in cost	Option 2b	Change in cost
	£m	£m	£m	£m	£m
HASU		11.7	11.7	11.7	11.7
ASU & TIA	19.9	8.0	-11.9	8.9	-11.0
BRI provision		0.4	0.4		
Total acute	19.9	20.1	0.2	20.6	0.7

Rehab beds	8.7	8.2	-0.5	8.2	-0.5
Rehab at home	1.1	4.7	3.6	4.7	3.6
Add transport		0.1	0.1	0.3	0.3
Total costs	29.7	33.1	3.4	33.7	4.1
System owned savings			-0.5		-0.5
Total movement			2.9		3.5

This assessment of cost movement is a net position and excludes potentially stranded costs/released capacity.

The BNSSG System partners have reviewed the movement of costs between settings in detail (see Section 11.3.1 below) and have concluded that these ‘stranded costs’ largely represent vacated capacity within the existing pathway. Healthier Together partners have agreed that this capacity will be used to address demand which is forecast for other acute services in future years, for example in emergency medicine and/or in reducing waiting lists post the Covid-19 pandemic.

The operational costs per bed day are summarised in Table 22 below and have been based on the national clinical guidelines for specialist stroke staffing levels (see Chapter 12, How the proposals meet the case for change).

In terms of costs per bed day, activity at the HASU will be the most expensive, and rehabilitation delivered at home will be the least expensive.

Table 22 – Operational cost per bed day*

	Baseline	Option 1b	Option 2b
HASU	N/A	£1,313	£1,313
HASU: thrombectomy	N/A	£1,321	£1,321
ASU	£803	£617	£672
Rehab bed	£310	£363	£363
Community contact	£86	£86	£86

**Operational costs exclude corporate overheads and some indirect costs. Note that overheads and indirect costs are recorded slightly differently by each provider*

Actual future state costs will be higher than those set out in the document, due to the impact of pay scale increases and other inflationary pressures but as these same pressures would apply to the baseline costs then they are excluded from the comparison.

There are other potential benefits from the service reconfiguration, which may be held outside of the BNSSG system, or which may not be within health spend:

1. The reconfigured service expects to treat thrombectomy patients from outside the BNSSG area. The current thrombectomy tariff does not cover all costs related to the thrombectomy service. It may therefore be possible to agree additional out of area income to offset these additional costs.

2. The reconfigured service aims to reduce mortality and disability, which should reduce social care costs and other costs to society. The estimated annual benefit has been calculated at £3.1m per annum. For further details of this calculation, please see section 11.5.4.

11.2 Capacity

In depth capacity planning has been undertaken on all aspects of the stroke pathway, from ambulance conveyance through to changes to the social care demand resulting from long term care needs after stroke across BNSSG. The outputs of this form the backbone of the workforce and financial analysis and underpin the financial analysis of the pre-consultation business case.

11.2.1 Capacity impact on SWASFT

The new model will result in all eligible patients within BNSSG being conveyed to a single HASU location at Southmead Hospital 24 hours a day, 7 days a week. A small proportion of patients to the very south of the BNSSG border would be conveyed to Taunton (around 1 stroke patient per week). In addition, there will be urgent secondary transfers required, whereby patients would be moved from an existing hospital location to the HASU. Secondary transfers will be for patients who self-present with stroke symptoms to the emergency departments at Weston Hospital or the BRI or those patients who experience a stroke whilst they are an inpatient in Weston Hospital or the BRI.

A detailed report on the capacity planning outputs of the SWASFT modelling and consequent impact on service provision, alongside an assessment of what resource requirements are expected to correct this, can be seen in Appendix 11.

Table 23 below provides the number of expected diverts and transfers resulting from the proposals for change, these figures include people with strokes and conditions that mimic stroke, which paramedics and/or hospital staff believe to be stroke on presentation:

Table 23 - Stroke Diverts & Transfers

Stroke Diverts

Original Patient Destination	Weekly Patients to Southmead Hospital	Weekly Patients to Taunton
Bristol Royal Infirmary	8.0	
Weston Hospital	2.2	0.6
Total	10.2	0.6

Stroke Transfers

Origin of Transfer	Weekly Patients to Southmead Hospital
Bristol Royal Infirmary	6.3
Weston Hospital	2.3
Total	8.6

In addition to the proposals for change, modelling for 20/21 has included the expansion of the Thrombectomy service at NBT, so that the full impact of the stroke proposals on SWASFT can be understood. The expected increase in transfers resulting from expanding the Thrombectomy service to include weekends 8am to 8pm can be seen in Table 24 below:

Table 24 - Thrombectomy Transfers

Origin of Transfer	Weekly Patients to Southmead Hospital
Bristol Royal Infirmary	0.5
Gloucestershire Royal Hospital	0.2
Great Western Hospital Swindon	0.2
Musgrove Park Hospital Taunton	0.5
North Bristol NHS Trust (Internal)	1.1
Royal Devon And Exeter Hospital Wonford	0.2
Royal United Hospital Bath	1.0
Weston Hospital	0.1
Yeovil District Hospital	0.2
Total	4.2

When this is combined with the changes proposed to the stroke pathway, the total number of additional conveyances that SWASFT would undertake to Southmead Hospital and Taunton per week can be seen in Table 25 below:

Table 25 - SWAST Combined Stroke and Thrombectomy Transfers

Origin of Transfer	Weekly Patients to Southmead Hospital	Weekly Patients to Taunton
Bristol Royal Infirmary	14.8	0.0
Gloucestershire Royal Hospital	0.2	0.0
Great Western Hospital	0.2	0.0
Musgrove Park Hospital	0.5	0.0
North Bristol NHS Trust (Internal)	1.1	0.0
Royal Devon And Exeter Wonford	0.2	0.0
Royal United Hospital Bath	1.0	0.0
Weston Hospital	4.6	0.6
Yeovil District Hospital	0.2	0.0
Total	23.0	0.6

The combined impact of the additional Thrombectomy changes and the proposed

reconfiguration of hospital care on the Ambulance Trust's response performance is shown in the number seconds that will be added to the mean performance times. Table 26 shows the outputs of the modelling, which simulates ambulances moving around the road network to accurately predict the change in response time that would be experienced as a result of the proposed changes to conveyances. It demonstrates that, in some areas and categories, patients will be waiting marginally longer for an ambulance to attend. This would have a negative impact on clinical care and patient safety if not corrected.

Table 26 - Impact on SWASFT Response Times

CCG	Cat1		Cat2		Cat3		Cat4
	Mean	90th	Mean	90th	Mean	90th	90th
NHS BNSSG CCG	0:00:00	0:00:00	0:00:06	0:00:16	0:00:22	0:00:17	-0:00:04
NHS BSW CCG	0:00:01	-0:00:06	0:00:06	0:00:16	0:00:23	0:00:00	0:00:03
NHS Gloucestershire CCG	0:00:01	0:00:05	0:00:03	0:00:00	0:00:21	0:00:21	-0:00:36
NHS Somerset CCG	0:00:02	0:00:00	0:00:05	0:00:11	0:00:25	-0:00:08	0:00:57

The required resources to mitigate the performance impact calculated above has been calculated as 36 hours of a dual crewed (two person) ambulance per week. **This is included in the financial assessment in order to maintain response times across BNSSG following the proposed changes to stroke provision.**

The total conveyances to Southmead Hospital are used as the starting point for the calculation of acute care requirements.

11.2.2 Capacity impact on acute care

The Emergency Department at Southmead Hospital will receive an additional 23 patients per week as a result of the proposals for change. This has been accounted for in the proposals through the development of an extended stroke service. A 24/7 specialist on call stroke team will providing specialist assessment on arrival at Southmead Hospital, avoiding admission into the Emergency Department where possible. Where immediate treatment within the ED is required, this will be delivered rapidly without the need for support from medical staff within ED, and stroke patients will be moved promptly to HASU or to Interventional Radiology for thrombectomy. It is anticipated that length of stay in Southmead Hospital ED for these patients will reduce from approximately 4 hours to approximately 2 hours on average as a result of the improved response from the specialist stroke workforce.

Immediate specialist assessment on arrival at Southmead Hospital will permit early recognition of non-stroke “mimics” and referral to the Acute Medical take, or appropriate specialty, without delay. A Same Day Emergency Care (SDEC) model including rapid access to diagnostics and therapy assessment, particularly MRI with prompt reporting, will operate 7 days a week over extended hours to support early diagnosis and where possible hospital discharge. This will also enable a “right scan first time” approach to be adopted, reducing unnecessary CT brain imaging.

The increased number of patients with non-stroke diagnoses attending Southmead Hospital following the proposed service changes will result in more of these patients requiring care from Acute Medicine. It is, however, expected that that the reduction in stroke patients staying on the Acute Medical Unit due to the full 24/7 stroke service will fully offset this, and the burden on Acute Medicine will not increase.

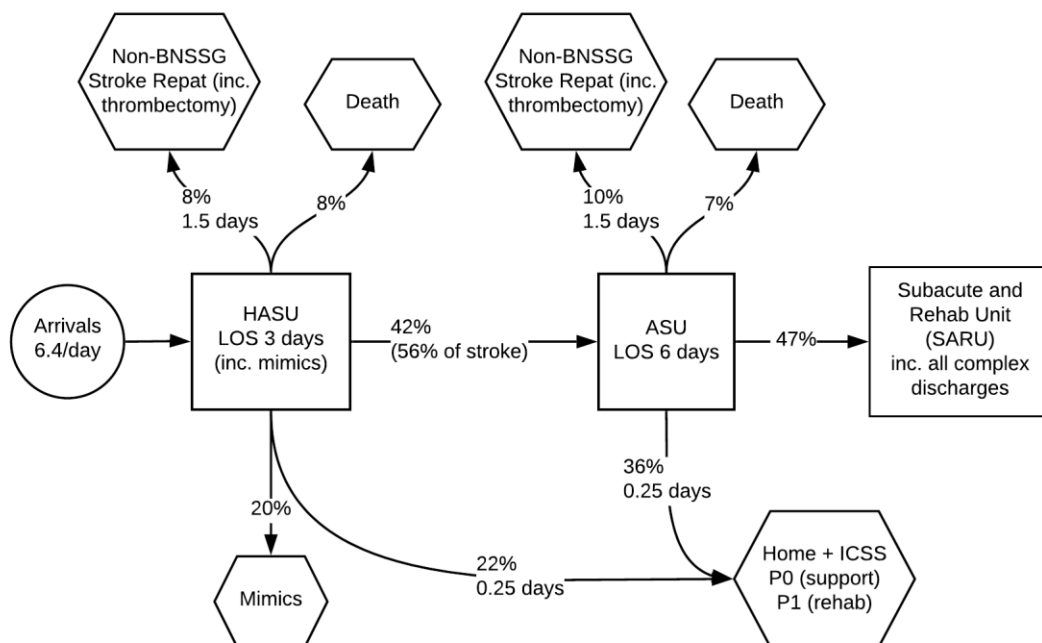
In addition, pre-hospital assessment of patients at the point of ambulance paramedic assessment and/or first assessment at the BRI or Weston Hospital is being explored as a means for further reducing unnecessary attendance of non-stroke mimic patients at Southmead Hospital. This is not yet confirmed and is therefore not included in calculations of the capacity required.

The additional numbers of patients arriving at Southmead Hospital will increase the requirement for diagnostic services, particularly brain and vascular radiology, and especially MRI. This increase in demand is included in the financial assessment. The ability of radiology services to accommodate the increase in demand is helped by:

- I. Early specialist stroke medical assessment for all patients resulting in imaging being carried out only where necessary, reducing CT investigations.
- II. The proposed TIA clinic model, whereby patients from NBT catchment referred to weekday TIA clinic from GPs, SWAST and Bristol Eye Hospital will attend TIA clinic at the BRI rather than Southmead Hospital, reducing MRI investigations at Southmead Hospital.

Acute bed capacity planning has been undertaken consistently for options 1 and 2 in line with Figure 40. For option 2, the flows are the same with the ASU provision split across two sites.

Figure 40 - Assumptions supporting acute capacity planning



The expected flows in the BNSSG future state stroke pathway have been calculated drawing on data from best practice systems, such as London and Greater Manchester (Salford). The length of stay and patient flows (percentage movement along the pathway) achieved in these systems have been applied using London HASU SSNAP data and a detailed clinical audit of 245 patients undertaken in 2017. The audit was validated using current BNSSG SSNAP data and refined using 2019/20 data from NBT to take account of reductions in acute length of stay since 2017. The outputs have been reviewed by the Stroke Programme Clinical Design and Delivery Group to ensure appropriate application in this area and with the described clinical model for BNSSG. An occupancy of 85% is applied to the HASU beds and 90% to the ASU beds.

The outputs of the capacity planning modelling for acute care can be seen in Table 27.

Table 27 - Outputs of the acute bed modelling

Future state beds predicted – Option 1b				
	Weston	NBT	BRI	Total
HASU	0	22	0	22
ASU	0	22	0	22
Total	0	44	0	44
Future state beds predicted – Option 2b				
	Weston/ North Somerset	NBT/South Glous	BRI	Total
HASU	0	22	0	22
ASU	0	14	9	23
Total	0	36	9	45

Option 2b adds an additional 1 bed as a result of time added for repatriation between Southmead Hospital and the BRI. All other modelling inputs and outputs are the same between the two options.

Figure 40 also provides the proportion of patients that flow from the hospital to community care. Capacity planning for the community service links directly to the acute capacity modelling; an overview of this can be seen below.

11.2.3 Capacity impact on Community Care

In the BNSSG area, four community pathways are established that require varying degrees of capacity and resource. The four pathways of care and a brief overview of the care provision can be seen in Table 28. All four pathways are incorporated within the Integrated Community Stroke Service (ICSS). The anticipated discharges from the HASU and the ASU to these pathways have been used to calculate the home care and community hospital provision required to adequately care for stroke patients outside of the acute hospital setting.

Table 28 - Community care pathways in BNSSG

Destination of patient and brief description of care provided	
P0	Home with follow up support only, with stroke-specific support primarily from voluntary sector services within the ICSS
P1	Home with rehabilitation therapy support (including the capability for intensive rehabilitation as currently provided by Early Supported Discharge services)
P2	Sub-Acute Rehab Unit (SSARU) – inpatient community bed with rehabilitation therapy support. These patients have greater medical, nursing and rehabilitation needs than “conventional” P2 beds provide for.
P3	Social care assessment bed

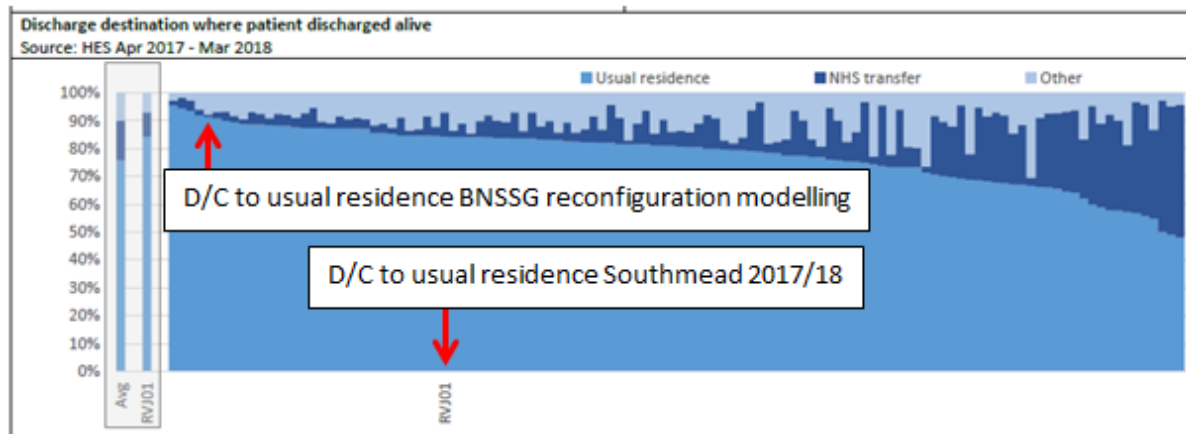
The flow of stroke patients into each of the pathways has been predominantly based on information from other best practice systems. In the BNSSG modelling, the number of patients that are anticipated to be discharged home are based on the average proportions seen in London: 35% of all stroke patients are expected to go home from the HASU and 35% of all stroke patients reaching ASU are expected to go home from there; this means that 55% of the total number of stroke patients will go onto Pathways 0 and 1 under the new BNSSG stroke service. The split between P0 and P1 is based on Salford’s discharge proportions as Salford operates an integrated community model, which London does not (ESD provision is variable across London which makes comparison difficult for community pathway splits expected from an integrated service). 26% of patients discharged from the acute hospital (HASU or ASU) are expected to go onto P0 and 36% are expected to go onto P1.

60% of the patients that are cared for on the ASU will require ongoing rehabilitation care in the SSARU (P2); this is 39% of the total discharges from acute care. Due to the short acute hospital length of stay, there is no P3 capacity expected to be required immediately post-discharge from hospital. This is because it will not be possible to assess a person’s long term care needs nor in most cases their long term rehabilitation potential so early in their care pathway – these patients will most likely go home under the “discharge to assess” model for social care assessment with rehabilitation provided by the ICSS as required or, if they cannot return home, they will transfer to SSARU (P2) care.

Secondary and tertiary demand for community care will exist in the new pathway for a number of patients as care needs/rehabilitation potential will often not be evident following immediate discharge from hospital. The community capacity planning has therefore been developed to enable the movement of patients between care pathways: secondary demand is based on a local 2017 audit, which provided a detailed clinical examination of 32 patients that would have been cared for differently had an integrated community model been available to them. Knowing the rehabilitation outcome of those patients has enabled the movement between community pathways to be assessed and the proportional splits between pathways have been applied accordingly. The final destination at the end of the pathway has then been validated and confirmed to correspond to the expected final destination for patient care in a best practice stroke system – i.e. 91% patients discharged alive from hospital get home at the end of the pathway, which is in the top 10% of GIRFT stroke pathway analysis.

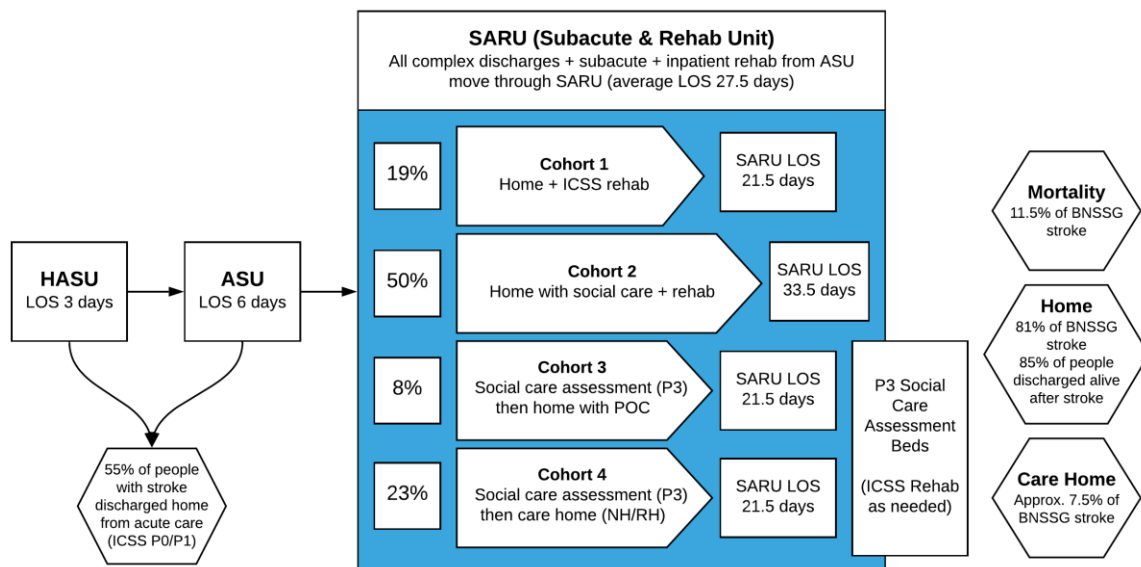
To assess the P3 requirements, NBT SSNAP data has been used to assess the number of people that would move from a temporary nursing home placement (for social care assessment) to home or to long term social care bed. This is illustrated in Figure 41 below.

Figure 41 - Discharges to home in the current and future state



A detailed assessment of length of stay in the SSARU has been undertaken. This uses information surrounding different cohorts of patients (see Figure 42) to give an average length of stay of 27.5 days.

Figure 42 - Cohorts of patients that will pass through the SARU



The overall community bed requirement in each Local Authority that results from the modelling assumptions described above can be seen in

Table 29. The proportional split between Local Authority areas uses the recognised community care proportions for each area for P3 capacity (this is also used for P0 and P1 capacity assessments). For P2, the hospital catchment areas are used so as to respect the usual patient flows across BNSSG (for example, people living in the Northern part of North Somerset are more likely to use South Bristol Community

Hospital than travel South to Weston Hospital). In the two SSARU model, this means that the distribution of community beds is 12-15 in Weston Hospital and 27-30 in a Bristol/South Gloucestershire location.

Table 29 - Outputs of the community capacity bed modelling (90% occupancy)

	system	
	p2	p3
max	49.5	19.0
min	32.1	12.4
avg	39.9	15.4
rounded	42	19

It should be noted that the number of patients expected to be discharged to P0 (home with follow up support only) is 350 and to P1 (home with rehabilitation therapy support) is 727.

The bedded and non-bedded capacity assessments for both the acute and the community provision have been used to drive the financial analysis. It should be noted that maintaining patient flow through the stroke pathway will be essential to the success of the new service model. Work with partners to ensure that effective management arrangements are in place to support the effective transition of patient care between sites or services will be a focus of the Clinical Design and Delivery Group as the programme works towards the decision making business case and implementation.

11.3 Financial Analysis

11.3.1 Cost effectiveness

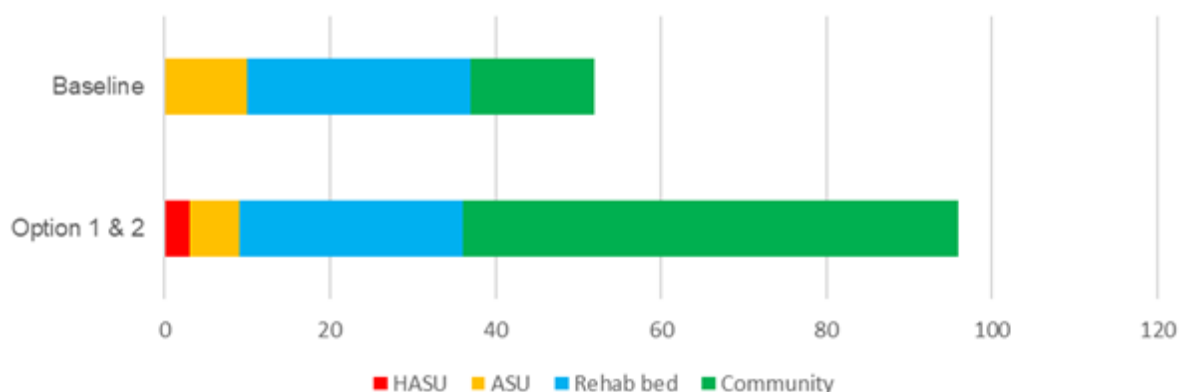
All options deliver significant improvements to care through a more streamlined pathway, however, the proposed service model is expected to be more expensive than baseline provision. This has been carefully considered by Healthier Together system partners and System Directors of Finance agreed that the new service model needed to fall within 10-12% of existing baseline costs to be considered for implementation across BNSSG. At PCBC stage, this has been achieved.

A large proportion of care delivery is switching from acute to the community. In total, patients will receive an average of 96 days of stroke care in the future state models compared to an average of 66 days of care in the current state. This represents an increase of 45%, which has been achieved through:

- A reduction in the number of acute hospital beds
- A reduction in the number of rehabilitation beds
- An increase in rehabilitation delivered at home and in the community

An overview of the care provision change proposed can be seen in Figure 43.

Figure 43 - Activity (bed days/patient visits) associated with the current and future state



*note baseline rehab bed days and community contacts are an estimate

Table 30 identifies where the change in net costs are seen across the system for Option 1b, with Table 31 identifying the change in costs from baseline for Option 2b.

Table 30 - Change in costs from Baseline – Option 1

	Baseline	Option 1b	Change in cost
	£m	£m	£m
HASU		11.7	
ASU & TIA*	18.6	8.0	
BRI provision**		0.4	
Total acute	18.6	20.1	1.5
Rehab beds	8.1	8.2	
Rehab at home	1.0	4.7	
Activity growth	1.9		
Transport		0.1	
Total costs	29.7	33.1	3.4
System savings			-0.5
Total movement			2.9

*Baseline includes the Thrombectomy investment

**This refers to onsite specialist stroke support provided to stroke patients that cannot be moved to the HASU because of other specialist care needs that only the BRI site can provide.

Table 31 - Change in costs from Baseline – Option 2

	Baseline	Option 2b	Change in cost
	£m	£m	£m
HASU		11.7	
ASU & TIA	18.6	8.9	
Total acute	18.6	20.6	2.0
Rehab beds	8.1	8.2	
Rehab at home	1.0	4.7	
Activity growth	1.9		
Transport		0.3	
Total costs	29.7	33.7	4.1
System savings			-0.5
Total movement			3.5

*Baseline includes the Thrombectomy investment

In the baseline model of care, Early Supported Discharge is provided from the acute providers and is within the ASU baseline. In the future model it is assumed that these costs will transfer to the ICSS model of care.

In addition to the above, the following items are included in the overall financial analysis:

- SWASFT performance mitigation at an additional £142k per annum.
- Additional patient transport service costs associated with patients transferring from HASU to BRI ASU in Option 2 of £120k.
- A reduction in spend at Frenchay Brain Injury Rehabilitation Unit (BIRU) – 13 patients in 2019/20 would be discharged earlier and cared for in the new community stroke model and therefore prolonged inpatient care on BIRU would be reduced.
- Local Authority staff currently undertaking reablement roles which are included in the future state options. No decision has been made concerning how these roles will be delivered in the future state. The baseline for this service has been shown separately to clearly delineate it.

11.3.2 Financial analysis

The current baseline for hospital care includes 51 beds, some of which are highly staffed. On average, the baseline operational cost per acute bed day is £803, and there is an average length of stay of 10 days.

The future state models are based on a reduction in acute beds, which will be split between HASU and ASU care.

In both options, there will be 22 HASU beds, with an average length of stay of 3 days. Three of these beds will relate to the extension of the thrombectomy service, and have an average operational cost per bed day of £1,321. The remaining 19 beds have an average operational cost per bed day of £1,313.

In Option 1b there will be 22 ASU beds at an operational cost per bed day of £617. This cost includes the costs of providing on site stroke cover and TIA clinic provision at the BRI.

In Option 2b, there will be 23 ASU beds at an operational cost per bed day of £672. The cost per bed day of Option 2b is higher than Option 1b due to the additional costs associated with running two units and the transfer time required between services; this option is therefore more expensive.

In both options, patients would be discharged home, to the community team or to a SSARU bed according to clinical need. 42 SSARU beds will be required in both options and will have an operational cost per bed day of £363; this is an increase on the baseline cost of £322.

Community slots are required in both options for 756 patients per annum, providing an average of 60 patient visits over 10 weeks per patient. The operational cost per visit of the ICSS will be £86.

The Tables below summarise the key indicators per option.

Table 32 - Baseline key indicators





	HASU 	ASU 	SSARU beds 	Community 	BRI on-site provision?
Beds	0	51	49		No
Length of stay		10 days	24 days	20 days	
Net daily cost per patient		£803	£310	£86 (estimate)	
Bsaeline activity £		£18.6m	£8.1m	£1.0m	£27.8m
Activity growth					£1.9m
Total cost					£29.7m

Table 33 - Option 1b key indicators:









	HASU 	ASU 	SSARU beds 	Community 	BRI on-site provision?
Beds	22	22	42		Yes - stroke workforce
Length of stay	3 days	6 days	27 days	60 days	
Net daily cost per patient	£1,313	£617	£363	£86	
Cost of stroke care	£11.7m	£8.4m	£8.2m	£4.7m	£33.0m
Transport					£0.1m
Total cost					£33.1m

Table 34 - Option 2b key indicators:

	HASU 	ASU 	SSARU beds 	Community 	BRI on-site provision?
Beds	22	23	42		Yes – stroke workforce through ASU
Length of stay	3 days	6 days	27 days	60 days	
Net daily cost per patient	£1,313	£672	£363	£86	
Cost of stroke care	£11.7m	£8.9m	£8.2m	£4.7m	£33.5m
Transport					£0.3m
Total cost					£33.7m

*The costs for the TIA service have been included in the ASU costs shown above.

11.3.3 Overall financial impact by organisation

The proposed reconfiguration of stroke services will impact on multiple partners across the system; as demonstrated in Table 35 and Table 36.

The starting point is the baseline position by provider increased for two years of forecast growth in demand and reflecting the development of Mechanical Thrombectomy for Ischaemic Stroke at North Bristol Trust.

This establishes a baseline cost of stroke services of £29.7m. This cost rises to £33.1m (Option 1b) and £33.7m (Option 2b) in the proposed future state. This increase includes the full assumed growth in overheads for providers. It also includes

a corporate overheads saving that the System has agreed should be addressed by the partners to prevent increasing costs; this is shown in Table 35 and Table 36 as a required system saving of £0.5m.

The tables below show how costs are being incurred or released by providers for each element of the planned patient pathway.

Table 35 - Baseline Costs by Provider and movement to future state – Option 1b

OPTION 1B							
	NBT	UHBW	Sirona SARU	Sirona ICSS	Other	System	Total
	£m	£m	£m	£m	£m	£m	£m
Baseline Position	15.3	9	0.5	0.5	0.7	-	26.1
Baseline Adjustment Growth (3.6% per annum)						1.9	1.9
Baseline Adjustment Thrombectomy	1.7						1.7
Adjusted Baseline Position	17	9	0.5	0.5	0.7	1.9	29.7
Future State Costs	18	2.1	8.2	4.7	0.1	-	33.1
Required system saving to address overhead growth						-0.5	-0.5
Total	1.1	-7.0	7.6	4.2	-0.6	-2.4	2.9

Table 36 - Baseline Costs by Provider and movement to future state – Option 2b

Option 2B							
	NBT	UHBW	Sirona SARU	Sirona ICSS	Other	System	Total
	£m	£m	£m	£m	£m	£m	£m
Baseline Position	15.3	9	0.5	0.5	0.7	-	26.1
Baseline Adjustment Growth (3.6% per annum)						1.9	1.9
Baseline Adjustment Thrombectomy	1.7						1.7
Adjusted Baseline Position	17	9	0.5	0.5	0.7	1.9	29.7
Future State Costs	17.3	3.4	8.2	4.7	0.3	-	33.7
Required system saving to address overhead growth						-0.5	-0.5
Total Movement	0.3	-5.7	7.6	4.2	-0.5	-2.5	3.4

Where costs appear to be released at a provider as a result of movements in the stroke pathway but in reality are un-releasable at the existing sites, these are recognised as vacated capacity. The drivers of vacated capacity are shown in Table 39 by provider.

The vacated capacity is acknowledged by the System as an opportunity to address future forecast demand for acute services and address existing constraints within acute capacity and sites.

Table 37 - Financial system impact of Stroke reconfiguration proposals – Option 1b

Option 1B							
	NBT	UHBW	Sirona SARU	Sirona ICSS	Other	System	Total
	£m	£m	£m	£m	£m	£m	£m
SARU investment	-2.9		6.9		-0.2		3.8
ICSS community service				3.7	0.0		3.7
HASU investment	2.8						2.8
Movement of ASU beds	1.5						1.5
TIA move to central service	-0.1						-0.1
Provider overhead costs	0.2		0.8	0.5		-0.8	0.6
Additional system growth						-1.9	-1.9
Transfer SBCH to Sirona		-1.4	0.5				-0.9
Increased ambulance costs					0.1		0.1
Vacated Capacity	-0.4	-5.6	-0.5		-0.5	0.3	-6.7
Total movement	1.1	-7.0	7.6	4.2	-0.6	-2.4	2.9

Table 38 - Financial system impact of Stroke reconfiguration proposals – Option 2b

Option 2B							
	NBT	UHBW	Sirona SARU	Sirona ICSS	Other	System	Total
	£m	£m	£m	£m	£m	£m	£m
SARU investment	-2.9	0.0	6.9		-0.2		3.8
ICSS community service				3.7	0.0		3.7
HASU investment	2.8						2.8
Movement of ASU beds	0.8						0.8
TIA move to central service	-0.1	0.0					-0.1
Provider overhead costs	0.1		0.8	0.5		-0.8	0.6
Additional system growth						-1.9	-1.9
Transfer SBCH to Sirona		-1.4	0.5				-0.9
Increased ambulance costs					0.3		0.3
Vacated Capacity	-0.4	-4.3	-0.5	0.0	-0.5	0.3	-5.5
Total movement	0.3	-5.7	7.6	4.2	-0.5	-2.4	3.4

The vacated capacity described above relates to clinical beds and related costs that are utilised by the stroke service in the baseline position, but which will not be required by the stroke service in the future state. This capacity will therefore be available for the system to use to address other operational pressures. A detailed breakdown of this vacated capacity is shown in the tables below, it can be seen that the vast majority is held within UHBW.

Table 39 - Drivers of vacated capacity - Option 1b

Option 1b							
	NBT	UHBW	Sirona SARU	Sirona ICSS	Other	System	Total
	£m	£m	£m	£m	£m	£m	£m
Vacated Capacity							
Outlier Beds in non-stroke wards	-0.4						-0.4
Sirona existing rehab beds			-0.5				-0.5
LA reablement staff					-0.5		-0.5
BRI ward		-2.3					-2.3
Weston Uphill ward		-1.4					-1.4
Other UHBW releasable capacity		-3.2					-3.2
SBCH transfer to Sirona		1.4					1.4
System						0.3	0.3
Total explained	-0.4	-5.6	-0.5		-0.5	0.3	-6.7

Table 40 - Drivers of vacated capacity - Option 2b

Option 2b							
	NBT	UHBW	Sirona SARU	Sirona ICSS	Other	System	Total
	£m	£m	£m	£m	£m	£m	£m
Vacated Capacity							
Outlier Beds in non-stroke wards	-0.4						-0.4
Sirona existing rehab beds			-0.5				-0.5
LA reablement staff					-0.5		-0.5
BRI ward		-2.3					-2.3
Weston Uphill ward		-1.4					-1.4
Other UHBW releasable capacity		-1.9					-1.9
SBCH transfer to Sirona		1.4					1.4
System						0.3	0.3
Total explained	-0.4	-4.3	-0.5		-0.5	0.3	-5.5

The financial assessment has been limited to health provision to date, although an estimate of potential benefits has been included in the “value for money and future growth” section, 11.4.10 below. Social care impact will be reviewed and, where agreement is reached, included in the Decision Making Business Case.

The financial model is underpinned by detailed workforce modelling to confirm the staff required to ensure safe staffing rotas and the appropriate staff and skill-mix to achieve the quality standards for the service. Table 41 and Table 42 below summarise the staffing within the existing baseline model and the requirements to deliver the future state options. Where numbers exceed future requirements, these are associated with vacated capacity and would be deployed within the health system to address forecast increases in demand for acute care.

Table 41 - Summary of the staffing WTE and cost increase between the baseline and future state under Option 1b

Staff Group	Baseline	Option 1b	Increase/ (decrease)	Increase	Increase
	WTE	WTE	WTE	%	£m
Medical staff	38.2	41.9	3.7	10%	£0.4m
Nurses - registered	172.6	103.5	(-69.1)	-40%	-£2.0m
Nurses – unregistered	48.8	65.0	16.2	33%	£0.8m
Therapy staff	82.7	132.4	49.6	60%	£2.8m
Other staff	48.9	63.2	14.2	29%	£0.7m
Total pay	391.2	405.9	14.7	4%	£2.9m

Table 42 - Summary of the staffing WTE and cost increase between the baseline and future state under Option 2b

Staff Group	Baseline	Option 2b	Increase/ Decrease	Increase	Increase
	WTE	WTE	WTE	%	£m
Medical staff	38.2	41.4	3.2	8%	£0.4m
Nurses - registered	172.6	109.0	(-63.6)	-37%	-£1.8m
Nurses – unregistered	48.8	65.4	16.7	34%	£1.1m
Therapy staff	82.7	134.3	51.6	62%	£2.8m
Other staff	48.9	64.5	15.6	32%	£0.8m
Total pay	391.2	414.6	23.4	6%	£3.4m

The tables above show the overall movement in staff. The following charts show predicted staffing changes by location and service. In the charts, items in green represent an increase in WTE, and items in orange represent a decrease in WTE.

Figure 44 - Summary of staff changes – Option 1b

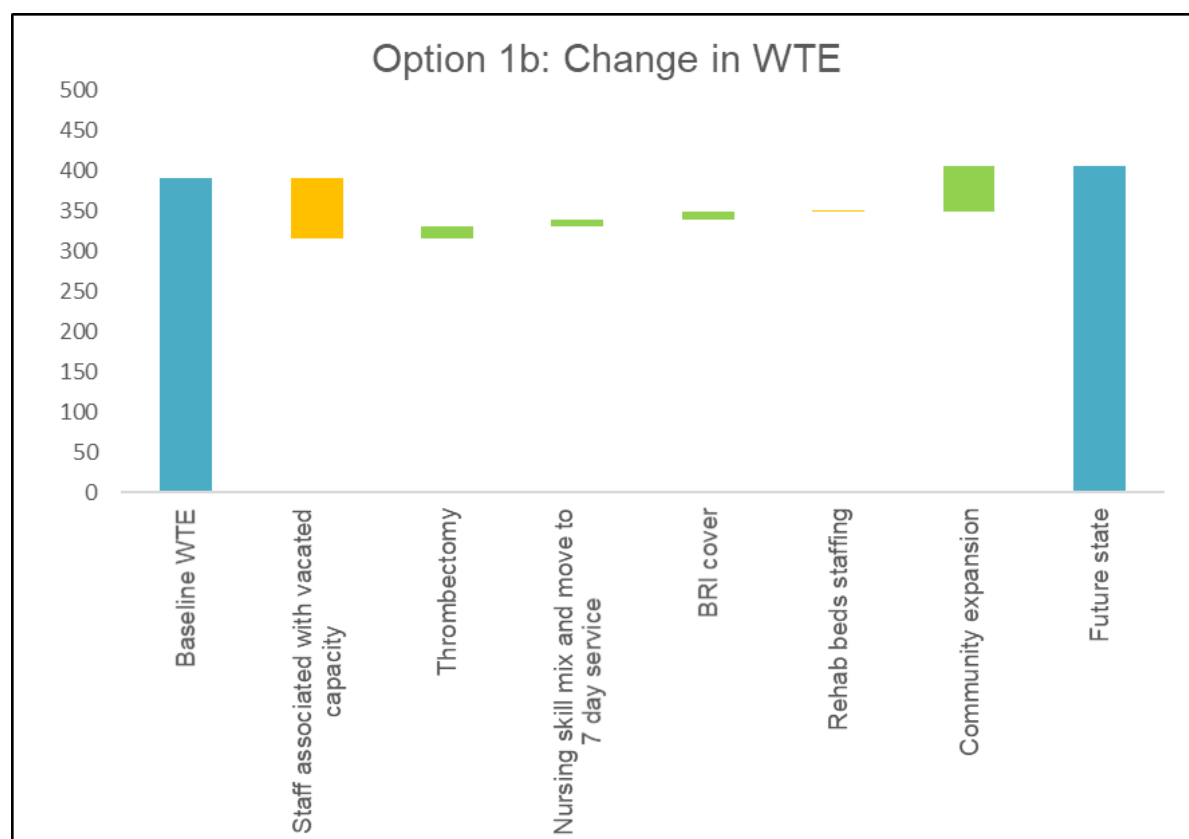
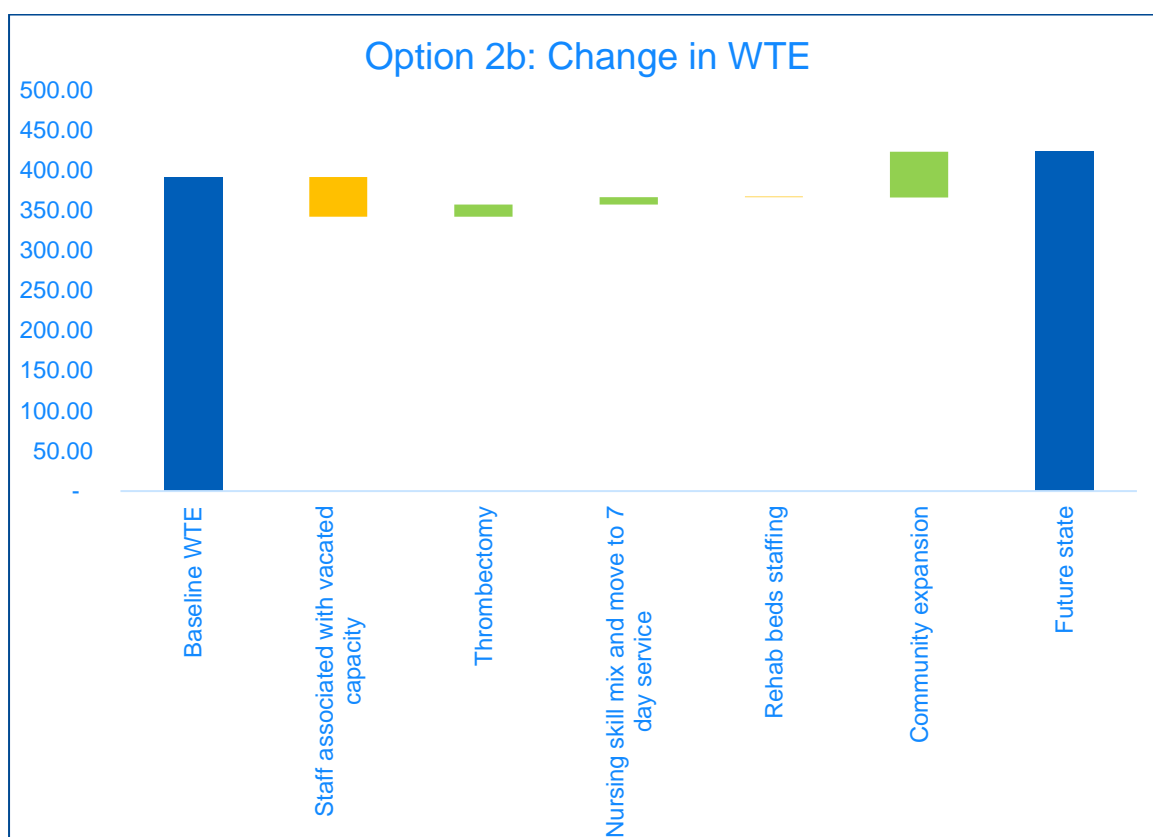


Figure 45 - Summary of staff changes – Option 2b



The increase in staff included in the future state model creates a recruitment risk; the mitigations to this are set out in the workforce section (Section 10.4). This needs to be carefully balanced with the ambition to meet National Guidelines, which are proven to positively impact outcomes for patient. NBT has also now been confirmed as a National Centre for Thrombectomy, which will make BNSSG more attractive to specialist stroke clinicians and help mitigate the recruitment risk. This is described in more detail in Section 10.4.

11.3.4 Tariff income

Under the Payment by Results financial framework, acute hospitals are paid for the activity that they undertake, and payment is largely made on the basis of nationally set tariff prices. In 2018/19, NBT, UHBW and Weston made a loss on stroke care, when costs are compared to the income that they received.

Due to the current uncertainty surrounding the future financial regime within the NHS, this financial analysis has not concentrated on tariff income. Instead, it has been built up from the costs of providing stroke care locally and an assumption has been made that the system will work together to mitigate any financial risk incurred by individual organisations as a result of the reconfiguration and so the modelling has focussed on the total cost of delivering the baseline or the two options.

11.3.5 Overheads and lost income

The system has agreed that *in principle* service reconfigurations that do not involve an increase in patient numbers, or a change in capital expenditure, should not attract an increase in overhead costs. Where individual organisations can demonstrate that the increase in overheads is unavoidable, they should be fairly reimbursed for the overheads that they incur and for any loss in income that they experience.

This financial analysis has included estimated additional overheads in the future state costs. It is assumed that the net impact of these overheads (£0.5m) will be a saving to be identified by the System.

11.3.6 Capital and estates costs

No capital costs have been included in this PCBC. The working assumption for the PCBC is that all the capital requirements of the service model are available within existing NHS estate. The exception to this is inclusion of costs relating to the expansion of the community service (a cost within all options) which relates to office space.

In all other cases, estate for the proposed new model of care is already in use and is expected to be available for provision of the new service model in:

- Southmead Hospital - HASU and ASU provision
- BRI - ASU care in option 2
- Weston Hospital - SARU provision
- South Bristol Community Hospital/the Frenchay site - SSARU provision

IT costs relating to systems, licences, maintenance, devices and depreciation have been included within the future state costs. £660k has been included for these costs within the ICSS costs, and an additional £50k within the acute costs.

The System will review any potential capital costs following consultation and confirmed model for the future state. The System will consider these costs within its future capital plans and resource prioritisation.

11.3.7 Transitional costs

The financial analysis does not currently include a value for transitional costs. It is anticipated that transitional costs will be incurred, to include:

- Costs of implementation – e.g. short term staffing costs
- Double-running of services – currently anticipated to be in the region of 1 month of costs
- Set up costs for new facilities – e.g. to provide rehab equipment

These costs are not anticipated to be material. These costs will be considered by the System following consultation and confirmation of the model for the future state. The

costs of transition will be addressed through the System revenue and capital plans as appropriate.

11.3.8 Risk

Notable risks in the financial analysis are:

- SSARU bed costings have assumed two units of equal size, this does not accurately reflect the expected distribution of beds with approx. one third of beds to be located in Weston Hospital and two thirds to be placed in the Bristol/South Gloucestershire area. There is a risk that one small unit and one large unit could alter the cost of the SSARU provision.
- There is a risk the 2019/20 and 2020/21 growth in service costs has been lower than estimated, and therefore the net cost increase is higher than set out in this analysis.
- The vacated capacity identified as a result of the re-design of stroke services is not able to be re-purposed by the System.
- The system partners have committed to reduce the increased corporate overhead modelled as a consequence of this change, this requires offsetting savings elsewhere in the cost base.

A high level of detail has been achieved in the costs and staffing requirements for the future state options. Therefore, a comprehensive financial sensitivity analysis is not required at this stage. Stochastic modelling has been run to identify any potential issues with the activity and capacity modelling. For further details, please see Appendix 10.

11.4 Value for Money and Future Growth

The proposed stroke reconfiguration aims to redistribute available funding, to match funding to clinical and patient need through:

- Standardising services across BNSSG – All patients living within BNSSG across BNSSG will receive the same service
- Increasing clinical input in the first three days following a stroke to reduce disability – All suspected stroke patients will be conveyed to the single HASU and admitted for immediate specialist hyper-acute stroke care, if clinically appropriate
- Increasing community rehabilitation, to further reduce long-term disability, and improve post-hospital patient experience - All patients will have access to an average of 60 sessions of rehabilitation, matched to clinical need

Currently, the future state costs create an affordability gap against Option 1b and Option 2b as see in Table 43 below:

Table 43 - Future state costs affordability gap

	Option 1b	Option 2b
System movement	£2.9m	£3.4m

The proposed reconfiguration does provide off-setting benefits to achieve value for money. These benefits are less easy to quantify, but an estimate has been included in this section.

11.4.1 Vacated Capacity

Under Option 1b, the costs relating to 14 acute beds will transfer to NBT. Under Option 2b, costs relating to 5 acute beds will transfer. There is no plan to close these beds at the BRI, and therefore they represent potential additional capacity for the system to use:

- Under Option 1b, an additional 5,110 acute bed days would be available within the NHS.
- Under Option 2b, an additional 1,825 acute bed days would be available.

Therefore, Option 1b provides a higher level of re-useable acute capacity than Option 2b.

The system is anticipating high levels of elective activity over the next few years, and therefore additional system capacity will help to ease waiting list backlogs. If the system had to use private sector capacity to meet waiting list requirements, this would be a cost to the system.

Currently, large numbers of stroke patients are treated as medical outliers in non-stroke beds, particularly at Southmead Hospital. This leads to inefficiencies within a hospital. As well as improving throughput for stroke patients, the reconfiguration may lead to improvements in efficiency in other specialties, due to the reduction in pressure from medical outliers.

Vacated capacity in the baseline relating to the cost of medical outliers (£418k) and relating to community provision of 6 rehab beds at various locations may also be available to meet growth in demand for non-stroke acute care and rehabilitation.

11.4.2 Benchmarking to other systems

Table 44 provides an overview of the investment per stroke that is proposed in this PCBC. This is based on 1,683 strokes per annum.

Table 44 - Future state costs and investment

	Option 1b	Option 2b
Investment	£2.9m	£3.4m
Estimated strokes p.a. *	1,683	1,683
Investment per stroke	£1,730	£2,103

**The estimated number of strokes per annum in the future state is based on SSNAP data plus growth.*

Benchmarking has been undertaken to review the extent to which similar stroke reconfigurations have required investment. Most reconfigurations reviewed appeared to require some investment. The best comparable data was available for the Manchester and London reconfigurations: in 2010, the London reconfiguration required an additional investment of £1,816 per stroke (£2,056 indexed to 20/21),

and the Manchester reconfiguration required an extra £1,175 per stroke (£1,330 indexed to 20/21).

This level of investment is equivalent to the proposed investment in BNSSG. However, it should be noted that the BNSSG proposed reconfiguration is more far-reaching than those undertaken in London and Manchester in 2010, and in particular includes a substantial investment (£3.3m) in community rehabilitation that was not part of the baseline provision. Therefore, compared to investments made by other systems, the BNSSG proposals appear to offer value for money.

11.4.3 Financial benefits on long term care provision

BNSSG currently benchmarks poorly against the national average for the number of patients discharged to a care home, including new and permanent institutionalisation after stroke. This is particularly the case for patients treated at Weston Hospital, where stroke unit access is most challenging and early supported discharge services are not available for patients living in North Somerset.

Table 45 provides an overview of the number of individuals discharged to long term care annually.

Table 45 - Individuals discharged annually to long term care following a stroke

	Number of individuals annually (percent of discharged alive)				
	NBT	UHBW	Weston	BNSSG	National**
Discharged to a care home	90 (13.5%)	41 (10.4%)	51 (23.5%)	182 (14.3%)	9.0%
Newly institutionalised (includes those temporarily and permanently institutionalised)	59 (8.8%)	28 (7.3%)	41 (18.8%)	128 (10.0%)	5.8%
Newly and permanently institutionalised	38 (4.7%)	27 (7.0%)	25 (11.7%)	90 (7.2%)	4.2%

* Data from SSNAP 2019/20 (Team-centred post-72-hour cohort), with slight scaling to future discharge numbers

**England, Wales and N Ireland

There is limited evidence about the costs of long term care. Table 46 below presents the conclusions drawn from two key studies in 2014, which give a cost per 90 days of care associated with different levels disability need:

Table 46 - Cost of providing long term care by level of disability

Disability score	Cost per 90 days (2014)	Cost per 90 days (inflated to 2020)	Source
90-day costs Barthel score* of 20–10	£459	£517	Franklin <i>et al.</i> (2014) ⁸⁴ https://www.ncbi.nlm.nih.gov/books/NBK537635/table/table11/?report=objectonly
90-day costs Barthel score of 0–9	£1926	£2171	Franklin <i>et al.</i> (2014) ⁴²
90-day costs residential care or nursing home	£10,647	11,999	Gordon <i>et al.</i> (2014) ⁸⁵

**Barthel is a disability indicator – a low Barthel score is associated with high disability.*

The capacity planning work for the new model of care proposed by the BNSSG Clinical Stroke Reconfiguration Board draws in benefits associated with best practice care, as evidenced by other systems that have made progress on the delivery of stroke care in recent years. Reduced length of stay in hospital and proportion of individuals discharged home, as opposed to needing inpatient rehabilitation, are all captured in the outputs of the capacity modelling work for the proposed future state.

The long term care needs that would be avoided by the proposed model for stroke care have also been assessed using available evidence on the efficacy of the treatment of stroke. This has been drawn together in Table 47 below to provide an assessment of the benefit that the new service model will bring to the BNSSG population. This is presented by service component and displayed as the number of individuals that will be positively impact by the changes proposed:

Table 47 - Benefit achieved by proposed stroke interventions when applied to the BNSSG population

Benefit achieved by the new model (individuals, annually)*			
	Additional people fully independent at home	Deaths avoided	New and permanent care home avoided
Thrombolysis	7	0	4
Thrombectomy (BNSSG)	6	1	6
Access to HASU care	33	11	33

⁸⁴ [TABLE 11, \[Cost inputs for the 90-day and 10-year model\]. - Evaluation of reconfigurations of acute stroke services in different regions of England and lessons for implementation: a mixed-methods study - NCBI Bookshelf \(nih.gov\)](#)

⁸⁵ Gordon AL, Franklin M, Bradshaw L, Logan P, Elliott R, Gladman JR. Health status of UK care home residents: a cohort study. *Age Ageing*. 2014;43:97–103. doi: 10.1093/ageing/aft077.

Home therapy support (equivalent to ESD)	14	0	14
Total (BNSSG)	58	12	57
Thrombectomy (non-BNSSG)	12	3	11
Total (all)	70	15	68

**Workings and assumptions behind these figures are available*

Taking the information provided above an assessment of long term care costs that will be avoided by the proposed model of care for stroke can be provided. This can be seen in Table 48 below:

Table 48 - Cost of long term care avoided by the proposed new service model

Annual cost of long term care avoided		
	BNSSG	All
New and permanent care home avoided	£2,735,772	£3,263,728
Temporarily newly institutionalised*	£287,976	£319,653
Additional people fully independent at home	£119,832 - £503,672**	£144,760 - £607,880
Annual TOTAL	£3,143,580 - £3,527,420	£3,728,141 - £4,191,261

**This has been assessed by attributing the same % reduction of permanent care home placements to temporary care home placements and assumes the temporary placement is 90 days long.*

***Range is high Barthel score cost to low Barthel score cost*

Of note, the financial benefits:

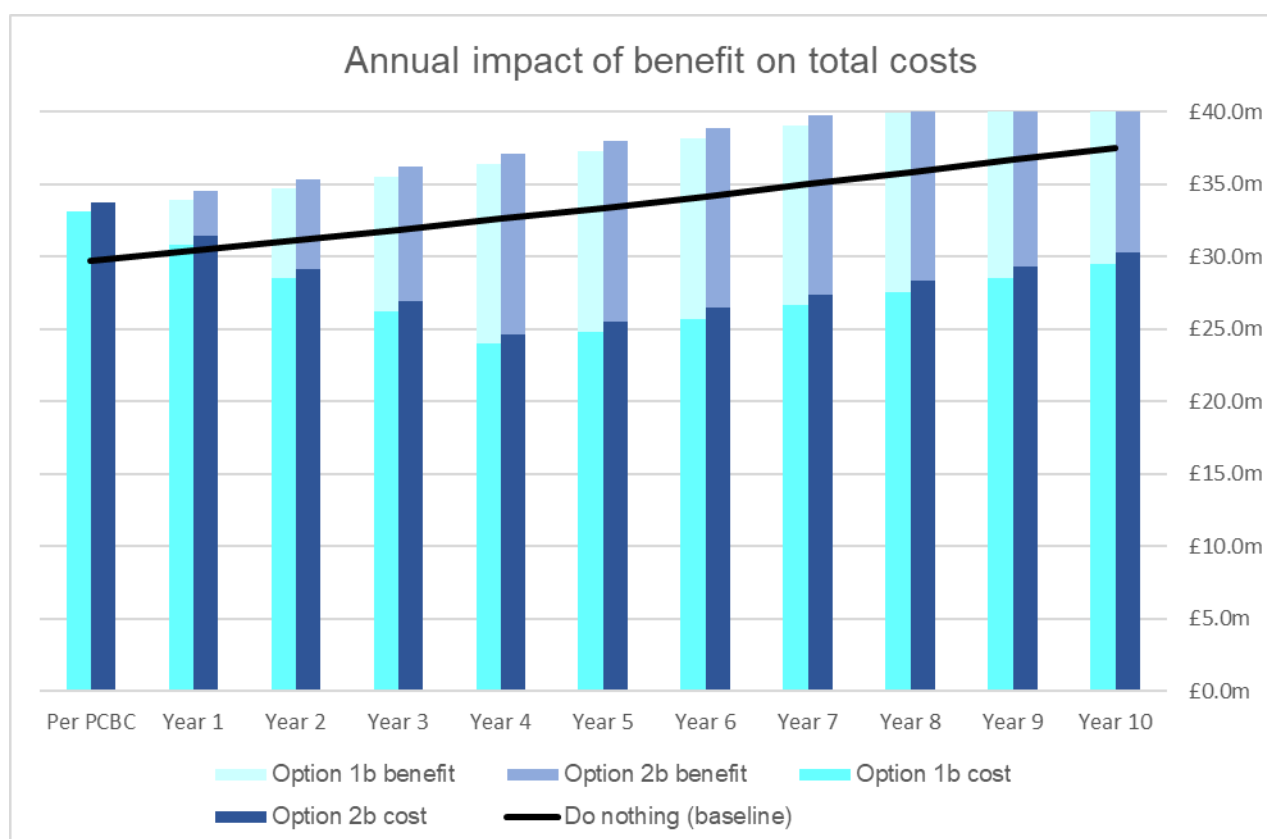
- will predominantly be seen in local authority spends across BNSSG with an approximate split of 38% in Bristol, 31% in North Somerset and 31% in South Gloucester
- have not been specifically drawn into the financial analysis presented in the Stroke Reconfiguration PCBC and are therefore additional to the “bottom-line” position presented in the business case
- are recurrent but will slowly diminish over time as people die and as less new people enter long term care.

Clearly, the financial benefits described above are estimated assessments, based on available evidence, however, the scale of annual recurrent impact likely to be seen from the proposed new service model in the BNSSG area is significant and in the region of £3-3.5m.

Stroke patients who are discharged from rehabilitation with a high level of disability are estimated to live on average for 4 years following a stroke⁸⁶ this therefore allows an annual benefit to be calculated. Figure 46 sets out how these benefits would compare to the baseline position and the total future costs in Option 1b and Option 2b (including risk of non-releasable costs), and uses the more conservative estimate of £3.1m annual cost avoided:

⁸⁶ [Long-Term Survival Prognosis After Stroke - Practical Neurology](#)

Figure 46 - Annual impact of benefit on total costs



It can be seen that, under both options, if the potential benefits are deducted from total future costs, the proposed reconfiguration hits projected baseline costs (do nothing option) by around year 2 of implementation.

Whilst the benefit of the reduction in social care cost would not generally accrue to the health system, it does demonstrate that the proposed reconfiguration provides overall value for money.

11.4.4 Growth

Projections of growth in stroke incidence can be found in Chapter 4. Based on this growth in stroke incidence, bed numbers are projected to grow if mitigations are not applied.

This assumes growth of 2.4% per annum in the incidence of stroke as forecast by the British Association of Stroke Physicians⁸⁷. This excludes the higher level of growth associated with out of area thrombectomy that has been applied in the baseline adjustment to acknowledge the phased roll out of Thrombectomy. Growth has been applied to all incidents of stroke including 25% of mimics that are admitted to the bedbase with a LOS of <1day.

Expected growth and mitigations anticipated as the clinical model develops can be seen in Table 49. The mitigations have not been developed and tested in detail at

⁸⁷ [costs_of_stroke_in_the_uk_summary_report_0.pdf](#)

PCBC stage, but it can be seen that there are opportunities across a number of areas to manage the expected growth over the first 3-5 years following implementation within the planned bed base. This is one of the major benefits of the proposed clinical model, which could not be achieved if stroke provision continued in a non-integrated way across BNSSG.

Table 49 - Projected growth in stroke service provision

	Acute beds	Rehab beds	Total beds	Mitigations seen between 2021 and 2025	Impact on beds (approx.)	Revised Total Beds
Future state:						
Option 1b	44	42	86			
Option 1b 2025	49	47	97			97
				Same Day Emergency Care and pre-alert systems / tele stroke	-1 (acute)	96
				Benefits of HASU care	-2 (acute) -2 (SSARU)	94 92
				Reduced HASU Length of Stay	-1 (acute)	91
				Increased thrombectomy and thrombolysis	-1 (acute) -1 (SSARU)	90 89
				Primary and secondary prevention	-2 (acute) -1 (SSARU)	87 86
Future state:						
Option 2b	45	42	87			
Option 2b 2025	51	47	98			
				Same Day Emergency Care and pre-alert systems / tele stroke	-1 (acute)	97
				Benefits of HASU care	-2 (acute) -2 (SSARU)	95 93
				Reduced HASU Length of Stay	-1 (acute)	92
				Increased thrombectomy and thrombolysis	-1 (acute) -1 (SSARU)	91 90
				Primary and secondary prevention	-2 (acute) -1 (SSARU)	88 87

The proposed reconfiguration will ensure that all stroke patients are treated within a specialist stroke bed, and by a specialist stroke community team. As stated above, currently, large numbers of stroke patients are treated as medical outliers in non-stroke beds. Stroke rehabilitation patients are treated within general rehabilitation

beds, and community services have limited capacity to offer specialist stroke care outside of that which is provided by the ESD teams.

Under the proposed reconfiguration, all stroke patients will be treated within a specialised HASU, ASU or rehabilitation beds, according to clinical need. Additional resources will be available to ensure that all patients who need it receive high quality specialist community rehabilitation. Therefore, the proposed reconfiguration will be robust enough to be able to respond to small increases in patient demand. The large increases in stroke demand predicted by 2035 are in line with increases in patient demand predicted across the NHS, due to an ageing population. These large increases in demand for NHS services will need to be responded to as part of a general response to the changing health needs of an ageing population; further consideration will be given to this as the programme progresses.



12 How the Proposals Meet the Case for Change

The case for change, Chapter 3, presents clear evidence that reorganising stroke services across BNSSG is required to tackle four key issues:

- The increasing demand for stroke care and the limited specialist stroke workforce
- Variation in service provision
- Unmet/under-met national clinical standards
- Value for money

This chapter outlines how the proposals put forward for consultation with the public will meet the case for change. Differences between the two options are also highlighted where appropriate.

12.1 Demand for stroke care will increase and the specialist stroke workforce available to provide care is limited

The proposed reconfiguration of stroke services in BNSSG will ensure that the available specialist stroke workforce is most effectively deployed to support the population of BNSSG. Increasing centralisation (in all options), and managing stroke staff as one team, will support service delivery and allow specialist clinicians to have the maximum opportunity to positively affect peoples' outcomes. The option with the fewest locations is most likely to achieve the highest quality care as economies of scale are found and staff are able to be better coordinated to deliver care to patients. Areas that have centralised hyper-acute stroke care into a small number of well-equipped and staffed hospitals have seen the greatest improvements in patient outcome measures.⁸⁸

Centrally organised and locally operated TIA services will also ensure that there is improved access to specialist advice and support across BNSSG. This is particularly true in the Weston area, where weekend availability will be enhanced as a service improvement, giving this population much more timely access to intervention.

Digital development and advancements in remote care delivery also represent a significant opportunity to deliver stroke services differently across BNSSG. Telemedicine networks enable stroke-specific procedures to be performed safely by less experienced clinicians under the guidance of stroke medicine specialists. Improved network working enables the opportunity for collaboration and learning from other areas of the system and will further benefit the outcomes for patients.

Furthermore, the proposed changes will ensure that everyone living in BNSSG has access to the same opportunity for a positive outcome following a stroke. This is vital, because, in the same way that the incidence of stroke is increasing, other health conditions are too, and health and social care providers are needing to manage a rising demand for long term care. The avoidance of disability through the improvements proposed to the stroke pathway will help contain the disability burden

⁸⁸ NHS Long Term Plan, Stroke care. Accessed: <https://www.longtermplan.nhs.uk/online-version/chapter-3-further-progress-on-care-quality-and-outcomes/better-care-for-major-health-conditions/stroke-care/#ref>

that stroke has on long term social care and release significant resource (both funding and staff) back into the system.

12.2 There are variations in care and access to care

As noted above, the proposals for consultation standardise the stroke offer and ensure that the entirety of the BNSSG population has the same access to specialist interventions for stroke (such as thrombectomy and thrombolysis), specialist hospital care and specialist community care, which are known to improve outcomes. Under Option 1, hospital services are fully centralised. This provides the least transfers of care between settings and brings the hospital based stroke workforce together in one location.

Centralised services mean that, for many, travel times are increased and access is made more challenging. The BNSSG Stroke Programme has been aware of this through the development of the proposals for change. The evidence for centralising HASU care is compelling due to the highly specialised nature of the work and the critical co-adjacencies that support the achievement of the very best outcomes. However, for SSARU care, where hospital stays are the longest, there is much more opportunity to provide care locally. This must be balanced with available staff, as care for stroke rehabilitation remains specialist throughout the duration of the stroke pathway.

A higher number of units require more staff for the same number of beds, therefore options that reduce the staff needed to deliver high quality care need to be considered, even if that means less localised service provision. Options 1b and 2b have fewer SSARUs but these are available to everyone in BNSSG. Alongside this inpatient offer, the ICSS would be supporting people home as quickly as possible. In all options, the integrated planning across the system has been such that seamless transfer of care would occur between sites for patients that need to be transferred; as long as sufficient specialist staff can be found, there is no differential impact anticipated for patients between options.

To support delivery of the new model of care, the “single stroke workforce” that is proposed as a service improvement will ensure that the recruitment and retention challenge that the BNSSG area currently faces for specialist stroke staff is mitigated. Working as a single workforce will ensure that operational deficits in service provision can be addressed through central coordination and through drawing on a larger specialist resource pool. This will help maintain outcomes for patients, regardless of where they are receiving care or what part of the pathway they are in, and help retain staff by spreading the workload more evenly and allowing movement and rotation through different parts of the service.

It is anticipated that by bringing the service provision closer to national clinical standards (see Section 12.3 below) retention will be positively impacted and recruitment to the BNSSG service will improve. After reconfiguration, maximising the workforce available to provide care, will most support the delivery of a consistent service offer to the population of BNSSG.

12.3 National clinical standards

The NHS Long Term Plan makes clear reference to the correlation of a reduction in the number of stroke-receiving units, and an increase in the number of patients receiving high-quality specialist care. This was the basis on which the BNSSG Stroke Programme was commenced.

12.3.1 Immediate stroke care

Table 50 gives an overview of the national clinical standards described in the case for change, Chapter 4, and how the proposed model of immediate care will meet these if implemented.

Table 50 - Proposed model for immediate stroke care and impact on national clinical standards

Current state	Proposed model	Relevant National Clinical Standard
There is no formal HASU care available to patients across BNSSG	There will be one centralised HASU at Southmead Hospital	RCP organisational guidance 2.2.1B: Patients with acute neurological presentation suspected to be a stroke should be admitted directly to a HASU.
Acute stroke services are spread across three non-centralised hospitals.	Services for the region will be centralised at Southmead Hospital HASU	NHS Long Term Plan: The evidence is clear that centralised stroke units are more likely to reduce mortality and provide effective stroke treatment.
Not all patients who need it are offered thrombolysis within 4.5 hours	All patients with stroke who are identified in time, will have access to thrombolysis	NICE ng128: Alteplase (for thrombolysis) treatment [where appropriate] should be started as soon as possible within 4.5 hours of onset of symptoms Also RCP 3.5.1A and 3.5.1G: Recommendations for management of ischaemic stroke.
The number of eligible patients given thrombolysis within 1 hour is variable across BNSSG.	By re-organising delivery of thrombolysis and by centralising services, more patients will be able to access thrombolysis very quickly following onset of symptoms	NICE ng128 and RCP 3.5.1: Treatment should be started as soon as possible. SSNAP Key domain indicator 3.3: Thrombolysis within 1 hour of arrival at hospital.
Not all patients who need it are offered thrombectomy within 6 hours.	Access to thrombectomy will be increased by the proximity to interventional radiologist and neurosurgical teams in	NICE ng128 1.4.5: To be offered thrombectomy within 6 hours.

	the centralised HASU	
Not all patients are scanned within 1 hour of arrival at hospital	All patients will have timely access to scans within national standard targets	RCP 3.4.1: Patients with suspected stroke to receive brain imaging within 1 hour of arrival

12.3.2 Hospital stroke care

By having one centralised HASU and one or two ASUs, the delivery of highly specialised stroke care can be improved. The proposals outlined above will improve the care delivered at the most acute part of the stroke care pathway but will also have impact throughout other parts of the pathway. Table 51 gives an overview of the national clinical standards described in the case for change, Chapter 4, and how the proposed model of care will meet these if implemented; distinction is drawn between Option1 and Option 2 where appropriate.

Table 51 - Proposed model for hospital stroke care and impact on national clinical standards

Current state	Proposed model	National Standard
The length of time taken to be assessed by a stroke specialist consultant varies across the region.	By reconfiguring the structure and location of acute wards centrally, there will be greater access to stroke consultants assessments so reducing this time.	RCP 2.3.1B: Patients with suspected stroke should be assessed for emergency stroke treatments by a specialist physician without delay. SSNAP Key domain indicator 4.1: Assessment by stroke specialist consultant physician within 24 hours
Patients with stroke are sometimes delayed in accessing a bed on a stroke unit or are managed on other wards	By centralising the dedicated Hyperacute and acute stroke units, beds would be ring-fenced for stroke patients so there should be no delay with being admitted onto a stroke unit.	RCP 2.2.1C: Patients with suspected stroke should be admitted directly to HASU
Across BNSSG only 80-85% of patients are spending 90% or more of their time on a stroke unit	Having adequately staffed and bedded designated stroke units will mean that it is easier to ensure patients with stroke will spend at least 90% of their inpatient time on a stroke unit unless another medical need requires them to be cared for in another setting	SSNAP Key domain indicator 2.3: Proportion of patients who spend at least 90% of their stay in a stroke unit.
Across BNSSG not all patients are having their swallow screened within 4 hours	By staffing all parts of the stroke pathway adequately, all MDT activities should be able to function at a level that meets national guidelines.	RCP 3.10.1E Patients with acute stroke should have their swallowing screened within 4 hours and before being given any oral food,

	Greater intensity and specificity of training of the single stroke specialist workforce will mean that more staff will be able to perform assessments.	fluid or medication. SSNAP Key domain indicator 4.5: Applicable patients to have a swallow screen within 4 hours of arrival at hospital.
Across BNSSG only 48-60% of patients are assessed by all the necessary members of the clinical multi-disciplinary team within 72 hours.	By centralising the emergency and acute hospital care and staffing the HASU and ASU sufficiently, with rotas to reflect 24 hour/7 day demand, there will always be staff available to conduct assessments in the first 72 hours.	SSNAP Key domain 8.8. Proportion of applicable patients who are assessed by a nurse within 24h AND at least one therapist within 24h AND all relevant therapists within 72h AND have rehab goals agreed within 5 days

12.3.3 Community stroke provision and life after stroke

The ICSS model has been co-designed with service users, people with lived experience of stroke and their carers and will deliver:

- One community led specialist service working across BNSSG
- Timely and seamless transfer of care from acute hospital into the community - improving continuity of care
- The ability to provide equitable care and rehabilitation across BNSSG, improving health and wellbeing outcomes
- Improvement in integration between health and social care services

Table 52 gives an overview of the national clinical standards described in the case for change, Chapter 4, and how the proposed community model of care will meet these if implemented.

Table 52 - Proposed model for community stroke care and impact on national clinical standards

Current state	Proposed model	National Standard
Inequitable provision of stroke rehabilitation beds across BNSSG; Lack of community stroke beds impacts on length of stay in the acute hospitals	There will be 2-3 locality-based stroke units providing sub-acute care and rehabilitation based in North Somerset, and Bristol, and South Gloucestershire in variation "a". Each unit will have access to diagnostic facilities, gyms and assessment kitchens. Patients will experience the same level of in-patient and out-of-hospital care and rehabilitation across BNSSG.	RCP 6.4.1A: Commissioning recommendations – services should be capable of meeting the specific health, social and vocational needs of people with stroke of all ages.

	<p>Clear progression through the new stroke pathway will ensure patients are transferred from acute care to stroke sub-acute/ rehab beds at the earliest opportunity.</p> <p>Flow to maintain bed capacity in community stroke units will be supported by the ICSS who will facilitate timely discharge home, or into the community, when safe to do so.</p>	
Inconsistent, and in many places no 7-day provision of care and rehabilitation. Some areas do not have an adequate stroke specialist stroke service on discharge.	Therapy will be offered on 7 days a week in all bedded units and by the ICSS community team visiting people with stroke in their own homes	RCP 2.7.1K: People with stroke should continue to have access to specialist services after leaving hospital.
Patients with stroke across BNSSG do not get the intensity or duration of therapy that is required to meet their goals. In some areas only 60% get the Physiotherapy they need, in some areas only 50% get the OT they need and in some areas only 40% get the Speech and Language therapy that the need.	The ICSS bedded units and community teams will be staffed sufficiently to provide all patients with the intensity of therapy that is needed and is recommended in the guidelines. The service will not be time limited but will match patient's individualised goals.	RCP 2.11: People with stroke should accumulate at least 45 minutes of each appropriate therapy every day for as long as they are willing and capable of participating and showing measureable benefit from treatment.
There are no community stroke rehabilitation beds, or dedicated community stroke ESD service in the southern part of North Somerset	There will be a bedded Stroke rehab unit in North Somerset and a dedicated stroke specific community team (ICSS) who will provide out of hospital care and rehabilitation for people	RCP 2.7.1K: People with stroke should continue to have access to specialist services after leaving hospital.
Across BNSSG there is significantly inequitable and insufficient access to psychological support, and in some areas, no access to it at all.	All members of the MDT will receive training and be able to deliver a stepped care approach at a level appropriate to the patients' needs. All clinical teams within the ICSS will have access to a Psychologist.	NICE cg162: Core stroke rehabilitation teams should contain clinical psychologists. RCP 2.12.1A: Stroke services should have a comprehensive approach to delivering psychological care that includes specialist clinical neuropsychology input. NICE 1.5: Emotional functioning should be appropriately assessed, recognising that psychological needs may change over time.

Service users report feeling abandoned once discharged from hospital and access to social workers to plan long term care is sometimes delayed.	Closer integration with local authorities and social care providers will mean better access to social workers for planning long term care support for people with stroke.	NICE CG162 1.1.6: To be offered a social care assessment before leaving hospital. RCP 5.9.1.1B/D: people with stroke should be offered further therapy (if goals can be identified and potential for change is likely) and should be supported to develop their own self-management plan.
Formal 6 month reviews of people with stroke are not occurring in several parts of BNSSG	Formal reviews at 6 months will be a key part of the delivery of stroke care in the community and will be equitable across BNSSG.	NICE Quality Standard 2 (Stroke) – Quality Statement 7: People with stroke should have a structures social care review at 6 months and 1 year after the stroke. RCP Key recommendation: 5.9.1.1A: Structured reviews should occur at 6 months, 1 year and annually after stroke.
Voluntary sector support is currently not equitable across BNSSG and not accessed by all patients who could benefit.	Support from Voluntary organisations will be imbedded in the ICSS but will begin in bedded units to help people with stroke prepare to leave hospital. BNSSG will work with voluntary sector organisations (Bristol After Stroke and The Stroke Association) to ensure an equitable service across BNSSG	RCP 2.7.1G: before transfer of care and rehabilitation to home, [along with other planning] a patient with stroke should be offered contact with relevant voluntary agencies.

Following implementation, monitoring of the performance of the newly reconfigured stroke service will be essential. This will be undertaken through system-wide participation in SSNAP, which will allow national benchmarking of the BNSSG service, and also through the use of a series of outcome measures that have been developed with people and with lived experience of the service and represent things that they want to ensure the new service provides. These are described in detail in Chapter 13.

12.4 Value for money

Value for money is considered in detail in section 11.4. In considering the specifics highlighted in the case for change, the proposals do cost more than the current service provision but they improve value for money of the service offer in the following ways:

- A significant shift in spend is made from hospital to community care, leaving very expensive and highly needed hospital estate available for other uses.
- Patient care is delivered in line with national guidance across the pathway. This will improve outcomes and reduce the burden of disability on the wider health and care system, at a time when strokes are predicted to rise.
- In the new service model, greater attention is given to what adds value to the patient. Patient experience will be vastly improved through greater support between hospital and home, and in life after stroke, as the time-boundaries that people currently experience in their care are removed.
- An equitable service offer is also established so the variation in spend between providers, and on different populations within BNSSG, is removed.
- The “single stroke workforce” will ensure that a greater amount of flexibility in the use of the specialist workforce can be achieved and help mitigate expensive temporary staffing costs that can occur in fragmented units.
- The digital service improvements will also help ensure that value for money is maintained across the system, improving the operational flexibility of the workforce and the “reach” of specialist stroke staff beyond their immediate work environment. This will ensure that patients are can receive the care they need very rapidly and will help maximise the outcomes that the BNSSG service achieves for its population into the future.

13 Outcome Measures

The BNSSG Stroke Programme has put significant emphasis on the outcomes that will be measured as part of the reconfiguration and service improvement process. The main drivers have been to make the outcome measures meaningful for the individuals receiving the service, useful for the health system and the organisation of the service, and readily collectable, so as to be able to monitor and review changes over time.

13.1 Development of an outcomes framework

Contributors to this work have reviewed national and other regional stroke reconfigurations to learn from the development of outcomes in those areas to guide this work (e.g. Greater Manchester, London and draft national service framework).

Clinicians from across BNSSG have been consulted regarding the key local requirements for outcome measurement relating to historical and current service provision in the area, as well as considering what will be important to measure in the newly reconfigured service. It is widely acknowledged that patient-centred outcomes, as well as organisational performance indicators against national clinical guidance, are important to capture to measure this new service. The programme further draws on examples from the International Consortium for Health Outcomes Measures (ICHOM)⁸⁹, the British Society of Rehabilitation medicine and Outcomes Based Healthcare (OBH)⁹⁰, as well as examples from across the UK including the Greater Manchester model³.

13.1.1 Patient Centred Outcomes

Engagement with service users with lived experience and members of the public forms an integral part of the programme. Patient and public involvement and engagement, leading to co-production, has been an ongoing process for a number of years, across a number of different groups and organisations.

‘What Matters to You?’

The insight gained from the engagement work described in Chapter 5 has helped to guide the choice of what is measured. It has emphasised the importance of including outcome measures that can be reported directly by people using the services (Patient Reported Outcome Measures –PROMs) and also by capturing data about the service from other sources such as the SSNAP audit and from locally recorded information.

The International Classification for Functioning, Disability and Health (ICF) provides a framework for which both the care and support that is offered to people with stroke, and the tools used to measure that care, can be based. It is important that as a person with stroke moves through their rehabilitation journey, the care that is given reflects whether the need is at an impairment level, activity level or participation. The

⁸⁹ <https://www.ichom.org/>

⁹⁰ <https://outcomesbasedhealthcare.com/>

³ <https://gmsodn.org.uk/>

outcomes that are selected for measuring the new stroke service will capture data from all these areas.

Currently in the BNSSG region, there are a variety of ways of seeking feedback from patients with lived experience of stroke. Part of the reconfiguration process will be to align how patient reported feedback will be gathered from all the places that deliver stroke services. It is important that the specific detail of these outcomes translates into meaningful service design, which will continue to be developed as the programme moves through the formal consultation phases into implementation.

13.1.2 National guidance – Outcomes

The principle method by which stroke outcomes are captured and compared against guidance nationally is SSNAP. The SSNAP audit allows data to be reviewed at a regional and local level and looks at a number of ‘Key Indicators’ to evaluate the performance of stroke services and patient outcomes (these are detailed in Chapter 4, Figure 5.).

A further metric captured within SSNAP are patient follow up reviews, known as ‘6-month reviews’. This involves a review of a stroke patient’s progress 6 months after their stroke. The review provides the opportunity to assess whether a patient’s needs have been met, reviews their progress and offers support in setting further goals. By collecting this information about patient outcomes at six months SSNAP can look at:

- Changes in disability compared to discharge
- Where people have been discharged to (usual home or care home or change in place of residence)
- Unmet needs
- Mood and cognition, in particular identification of areas (sometimes called “silent symptoms”) such as fatigue, concentration and mood disturbance which can affect adversely quality of life and return to work and normal activities
- Secondary prevention issues, for example blood pressure management and appropriate management of atrial fibrillation.

BNSSG currently scores poorly in this domain and community services do not subscribe to SSNAP and contribute data. This will be rectified as part of the improvements so that this important information about how well people are managing 6 months following their stroke can be collected and used to continue to improve services.

13.2 BNSSG Outcomes framework

The full list of outcomes proposed for the service is summarised below, along with the agreed tools for measuring them. To promote the patient-centred approach of the stroke pathway reconfiguration, the outcomes have been arranged around the NHS outcomes framework domains described in Table 53.⁹¹

⁹¹ <https://digital.nhs.uk/data-and-information/publications/statistical/nhs-outcomes-framework/august-2020>

Table 53 - NHS Outcomes Framework

NHS Outcomes framework
Domain 1. Preventing people from dying prematurely
Domain 2. Enhancing quality of life for people with long-term conditions
Domain 3. Helping people to recover from episodes of ill-health or following injury
Domain 4. Ensuring people have a positive experience of care
Domain 5. Treating and caring for people in a safe environment and protecting them from avoidable harm

The NHS Long Term Plan, developed with the Stroke Association, also sets out a clear set of national outcomes and deliverables.⁹² BNSSG aims to contribute to these outcomes and these measures are proposed within the outcomes framework outlined in Table 54. These outcomes have been developed with clinicians and leads from across BNSSG and throughout existing stroke care pathways. Capturing the right information about the reconfigured stroke services in the future is essential and as such the exact outcomes used may need to be modified to reflect updates in practice and clinical knowledge such as the recently released NHSEI National Stroke Service Model.

Table 54 - BNSSG Outcomes Framework

NHS Outcome Domain	Outcome Measure description	Tool
1.	1. Mortality rate of stroke patients at 90 days and at 1 year	SSNAP
	2. Percentage of all stroke patients given thrombolysis	SSNAP
	3. Percentage of all stroke patients given thrombectomy	Local data
	4. Percentage of applicable patients who were given a swallow screen within 4h of clock start	SSNAP
	5. Modified Rankin score pre-admission, immediately post-stroke and at discharge from each bedded unit	SSNAP +Local data
2.	6. Destination of patients discharged from HASU/ ASU	Local data
	7. Destination of patients discharged from Sub-acute unit	Local data
3.	8. Percentage of patients that were scanned within 1 hour of clock start.	SSNAP+ local data
	9. Percentage of patients directly admitted to a stroke unit within 4 hours of clock start	SSNAP
	10. Percentage of patients assessed by a stroke specialist consultant physician within 24h of clock start	SSNAP
	11. Percentage of applicable patients who are assessed by a nurse within 24h AND at least one therapist within 24h AND all the relevant therapists within 72h AND have rehabilitation goals agreed within 5 days	SSNAP
	12. Percentage of applicable patients who were given a formal swallow assessment within 72h of clock	SSNAP
	13. Patients' goals reviewed weekly	Local data
	14. Percentage of patients who spent at least 90% of their stay on stroke unit	

⁴ <https://www.stroke.org.uk/get-involved/campaigning/nhs-long-term-plan>

	15. Team centred SSNAP score separated by domain	SSNAP
	16. Percentage of patients who spent at least 90% of their stay on stroke unit	SSNAP
	17. Percentage of patients where IPC sleeve has been used if appropriate	SSNAP
	18. Percentage of adults having stroke rehabilitation in hospital or in the community offered at least 45 minutes of each relevant therapy for a minimum of 5 days a week for up to 6 weeks	SSNAP
	19. Percentage of applicable patients who have a continence plan drawn up within 3 weeks of clock start	SSNAP
	20. Percentage of patients receiving a visual assessment	Local data
	21. Percentage of applicable patients screened for nutrition and seen by a dietitian by discharge	SSNAP
	22. Percentage of adults who have had a stroke who can be referred to a clinical psychologist with expertise in stroke rehabilitation who is part of the core multidisciplinary stroke rehabilitation team	SSNAP
	23. Percentage of patients who were screened on admission to the Community Stroke Team for mood disturbance and cognitive impairment	SSNAP
	24. Length of stay in each part of the pathway	Local data
	25. Percentage of patients who demonstrate positive improvement following Community Stroke Team intervention	SSNAP +local data
	26. Percentage of adults who have had a stroke are offered active management to return to work and advice on driving if they wish to do so	Local data
	27. When follow-up is required out of hospital, initial contact within 72 hours	Local data
	28. Percentage of patients improving Patient Activation measure	Local data
	29. Percentage of patients with a joint health and social care plan in place prior to discharge	Local data
4.	30. Patient reported outcome measure of 'global health' EQ-5D	Local data
	31. Percentage of patients giving positive response on Friends and family test	Local data
5.	32. Percentage of patients readmitted within 28 days for any reason	Local data
	33. Percentage of patients receiving 6 month review	SSNAP and local
	34. Percentage of patients receiving 1 year review	Local data
	35. Percentage of patient having another stroke within 6 months	Local data

Further work is required, with oversight of the clinical design group, to define the denominators for the outcomes, at what point in a patient's or carer's journey they are measured, and any benchmarking or desired levels of achievement relating to them.

The outcomes described above allow for the measurement and performance of the reconfigured stroke service from an organisational perspective and from a patient

individual outcome and experience perspective. They also allow for capturing information of higher risk and harder to access groups, identified in chapters 3 and 4. There is planned ongoing work with colleagues working in specialist clinical and public health teams to ensure that outcomes for these groups continue to be appropriate and to seek improvements.

13.3 Achievement of outcomes

Planned changes to stroke care and provision have been designed to achieve an improvement in stroke services across BNSSG for all patients. These changes will create a demonstrable improvement in all outcome measures, such as those shown in Manchester following the reconfiguration implemented in March 2015 (Figure 7).

Below are some key examples of changes in the services that are provided which will result in improvement in the outcomes described above.

1. **Development of a centralised hyper acute unit at Southmead Hospital**, providing 24/7 thrombectomy and thrombolysis services will reduce the mortality rate and reduce the level of disability experienced following stroke.
2. **The development of a single Stroke specific workforce** will ensure seamless transition from hospital to community care. Acute care will be consolidated by establishing either one or two ASUs, at Southmead Hospital (co-located with HASU) and potentially at the BRI (Options 1 or 2, Chapter 8). Care will be delivered in line with patients' individualised goals at all stages through the new stroke service. Assessment of patients' needs and subsequent planning for meeting these needs with an integrated health and social care response will ensure that people with stroke feel supported throughout their rehabilitation journey and are given the best chance of achieving the goals that they set and develop through the stroke care pathway.
3. **Co-design of the new Integrated Community Stroke Service (ICSS):** Collaboration between BNSSG health providers and people directly affected by stroke has enabled the design of a community-based rehabilitation and integrated care service that provides the care and support that is needed, close to people's homes. The number of SSARUs will be determined through the consultation process in order to best meet the needs of the BNSSH population. The ICSS will deliver rehabilitation, care and support as a continuum, without requiring handover between community teams as patients' needs change.
4. **People will be supported to self-manage their condition in the community**, recognising that many stroke survivors continue to regain abilities for years after their initial stroke. Promoting independence will be a key target of the ICSS workforce and helping people with stroke to continually advance their goals as appropriate will identify where support continues to be needed in less intensive forms. The ICSS will work with the emerging Healthier Together 'Building Healthy Communities' infrastructure and in collaboration with voluntary sector organisations to deliver a wide range of services to support life after stroke.

13.4 Outcome measures – next steps

What is most important to patients is not always recorded by the NHS. Therefore, the local health system does not have a method of regularly evaluating how patients experience health services for stroke care which in turn limits opportunities to improve services. To support this, the local health system is starting work on an initiative that will measure the effectiveness of local stroke services according to what patients say is important to them. This will help to developed this suite of measures further and ensure that improvements to stroke services are targeted at the areas that matter most to people, as well as enabling the monitoring of any changes made.

14 Governance and Assurance

The assurance and governance requirements for proposals for change of this scale are rigorous and have to be completed in the correct sequence. Full system agreement on the proposals for change is required for the proposals to progress to decision making.

To enable this and facilitate the governance and assurance process, the programme has involved stakeholders from across the system and co-designed the proposals with people with lived experience of services throughout the development of the clinical model. An overview of the governance requirements and the steps the programme has taken to progress these are presented below. Further detail of the governance structure for the programme is shown in Appendix 2 and the associated timeline for decision making is described in Chapter 15.

14.1 Governance requirements

14.1.1 System Governance

Healthier Together ICS:

The BNSSG Stroke Programme sits under the Healthier Together Integrated Care System (ICS). The BNSSG ICS includes 11 organisations that provide and/or commission and health and social care for the population of BNSSG. There is therefore whole-system ownership of the process used to develop the proposals, and all risks relating to the proposals are shared.

The Healthier Together governance structure is made-up of three core groups which oversee partnership activities:

Table 55 - HT governance structure - core groups

1. The Partnership Board	<p>The Partnership Board, led by an independent Chair, is responsible for strategic leadership and direction setting within the ICS.</p> <p>The Board meet bi-monthly, in public, and membership includes all partner organisations, as well as representatives from NHSE&I, PHE, and Healthwatch.</p>
2. The Executive Group	<p>The Executive Group oversees and supports the various programmes that have been set up to deliver the ICS's strategy.</p> <p>The Group meets fortnightly and the membership is made up of the Chief Executives from the Partnership Board. The Group is jointly chaired by Robert Woolley, the CEO of UHBW, and Julia Ross, the CEO of BNSSG CCG.</p>
3. Clinical Cabinet	<p>The Clinical Cabinet is responsible for developing and overseeing the clinical strategy across the ICS, providing leadership, advice and assurance across all clinical programmes of work.</p> <p>The group meet fortnightly and membership includes Clinical Executive Directors, Medical Directors, Chief Nurses, Directors of Public Health, and a Bristol Health Partner representative. The interim Chair is Dr Peter Brindle, the Medical Director at BNSSG CCG.</p>

Support to proceed to public consultation on these service reconfiguration proposals has been given from from the Healthier Together Partnership Board.

The governance structure and the timetable underpinning these service reconfiguration proposals has been approved by The Healthier Together Executive Group.

Acute Care Collaboration (ACC):

The Acute Care Collaboration is chaired by the CEO of NBT, on behalf of the BNSSG ICS. Under the leadership of the Medical Director at the North Bristol Trust, BNSSG’s Stroke Programme has formed a central part of the Acute Care Collaboration’s strategy and work programme.

BNSSG Stroke Programme Board:

The BNSSG Stroke Programme Board includes representatives across the ICS organisations, clinicians, voluntary sector agencies, as well as patient and public contributors and service users. There have been monthly meetings of the BNSSG Stroke Programme Board throughout the life-time of the programme, including throughout the Covid-19 Pandemic when attention was given to the stroke specific Covid-19 response. Table 56 outlines key system groups and previous and future milestones, associated with system governance.

Organisational Governance:

All partner organisations have operated their own internal governance processes, which have ensured that clinicians working within the current services, and senior leadership teams within the affected organisations, have been kept apprised of the progress of the BNSSG Stroke Programme. Formal support for the proposals was sought in Winter of 2021 from each Provider Board. Approval for the programme to proceed was gained from Sirona Health and Care and NBT in January 2021, and from UHBW in February 2021. The feedback provided by these (and other partners) can be seen in Appendix 14, and the meetings themselves are included in Table 56 below, which provides a full overview of the System Governance Milestones.

Table 56 - System Governance Milestones

Date	Meeting	Purpose / Future Plan
Dec 19	Acute Care Collaborative (ACC)	Programme update
Feb 19	Acute Care Collaborative (ACC)	Programme update
July 20	Primary Care ‘Cell’	Seek programme engagement and feedback
Aug 20	Healthier Together System Directors of Finance	Review of work to date and strategic commitment to support further development
Aug 20	Acute Care Collaborative (ACC)	Programme update

Sept 20	Healthier Together Exec	To approve the governance route and the timetable for the programme
Oct 20	Acute Care Collaborative (ACC)	Programme update and overview. System review of the finance and activity assumptions.
Oct 20	CCG GP Members Event	To provide an overview of the programme of work and seek input on the proposals
Nov 20	Acute Care Collaborative (ACC)	Programme update and overview. System review of the finance and activity assumptions.
Dec 20	Acute Care Collaborative (ACC)	Support for the programme to move into further assurance
Dec 20	Integrated Care Steering Group	Engagement and support for the proposals
Dec 20	Healthier Together Clinical Cabinet	Enthusiasm to see stroke services improved and support for the clinical model
Dec 20	Healthier Together System Directors of Finance	Support for the financial analysis to be included in the Pre Consultation Business Case
Dec 20	Healthier Together Executive Group	Endorsement for the programme to move into further assurance
Jan 21	Healthier Together Partnership Board	Presentation of proposals for change
Jan 21	NBT Trust Management Team (TMT)	Senior management review and feedback
Jan 21	Sirona Senior Management Team (SMT)	Senior management review with support given to Pre Consultation Business Case
Jan 21	NBT Board	Support given to Pre Consultation Business Case
Feb 21	Acute Care Collaborative (ACC)	Feedback following Clinical Senate Review Panel
Feb 21	Healthier Together Executive Group	Decision on consultation proposals for NHSE/I assurance following Clinical Senate Review Panel
Feb 21	UHBW Senior Leadership Team (SLT)	Senior management review and feedback
Feb 21	UHBW Board	UHBW support to the proposals for consultation
March 21	Primary Care Strategy Group	Update on proposals for consultation and feedback on key milestones
March 21	Clinical Cabinet	Review of proposals and consideration of feedback from the Clinical Senate Review Panel and the NHSEI Stage 2 Assurance
March 21	Healthier Together Partnership Board	Update and assurance on the process for significant service change
March 21	Acute Care Collaborative (ACC)	Feedback following NHSE/I Assurance; Final Draft PCBC ahead of JHOSC

April 21	Acute Care Collaborative (ACC)	Programme update, including JHOSC feedback, legal advice and proposed evaluation criteria for decision making
May 21	Acute Care Collaborative (ACC)	Programme update, including draft consultation document
Dec 21	Acute Care Collaborative (ACC)	Pending: Draft DMBC for review and feedback
Dec/ Jan 21	Healthier Together Executive Group	Pending: Final Draft DMBC for System consideration and support
Dec/ Jan 21	Provider Boards	Pending: Final Draft DMBC for organisational consideration and support

14.1.2 Commissioning Governance

Regular reports have been taken to the BNSSG CCG Commissioning Executive Committee as well as specific elements to the CCG Strategic Finance Committee and the CCG Quality Committee. Table 57 provides an overview of the key CCG governance milestones:

Table 57 – BNSSG CCG Commissioning Governance Milestones

Date	Meeting	Purpose / Future Plan
Dec 19	Commissioning Executive Committee	Outlined the process to refine and evaluate a clinical model for recommendation to the CCG for a commissioning decision
Mar 20	Commissioning Executive Committee	Conclusions of the clinical evaluation process and to seek exec support for the programme to meet its objectives
June 20	Commissioning Executive Committee	Outline progress since March including covid-19 response. Noted the intention to take a Pre Consultation Business Case to the October CCG Governing Body Meeting (previous intention was June 20 pre covid-19 impact)
June 20	Quality Committee	Demonstrate progress to date, including clinical evaluation process and feedback from the Clinical Senate Desktop review. Review of the QIA
June 20	Strategic Finance Committee	Present baseline position for current health commissioned stroke services within BNSSG as well as next steps for determining the future state
Aug 20	Governing Body Seminar	Update presentation ahead of draft PCBC being presented.
Nov 20	Clinical (previously Commissioning) Executive Committee	Draft PCBC received and supported with workforce and financial impacts to be confirmed across system
Feb 21	Clinical Executive Committee	CCG support confirmed for the proposals for consultation now system agreement in place
March 21	Governing Body Closed	Draft PCBC with details of NHSE/I assurance ahead of JHOSC public meeting

May 21	Governing Body Closed	Draft Consultation Materials and Equality Impact Assessment
June 21	Governing Body Open	Final PCBC for decision to launch Public Consultation
October 21	Clinical Executive Committee	Pending: Initial findings from the Public Consultation
Nov 21	Governing Body Closed	Pending: Initial findings from the Public Consultation
Dec 21	Governing Body Open	Pending: Presentation of thematic review resulting from the Public Consultation
Dec 21	Clinical Executive Committee	Pending: Draft DMBC for review and feedback
Jan 22	Governing Body Closed	Pending: Final Draft DMBC for review and feedback
Feb 22	Governing Body Open	Pending: Final DMBC for decision making on commissioning

Liaison with Somerset CCG has also confirmed their support for the proposals (see Appendix 14), with further work to be completed to ensure that Somerset residents living close to the border of BNSSG can experience the full benefits of the proposals for change. This is covered in more detail in Section 14.2, below.

14.2 Assurance

Council Scrutiny - BNSSG

The programme has clear links with the Local Authorities and met with the chairs of all three Health Overview Scrutiny Committees (HOSC) in February 2020 and over the summer of 2020, following the Covid-19 surge when the programme was re-establishing. Work to date has centred around BNSSG because the impact of the proposals for change is nearly entirely focused on that local population. However, there is a small flow of patients expected to Taunton as a result of the proposals for change and therefore engagement with the Somerset HOSC will be an important part of the public consultation.

Table 58 - HOSC / Council Engagement

Date	Meeting
25 Feb 2020	NS, SG and BCC HOSC Chair's Briefing
28 July 2020	NS HOSC Chair informal briefing
7 Aug 2020	NS Lead Councillor for Health informal briefing
12 Aug 2020	SG HOSP Chair informal briefing
11 Aug 2020	NS Lead Councillor for Health and Care Briefing
19 Aug 2020	Briefing to BCC HOSP chair and council officer
21 Sept 2020	Healthier Together Executive Group
18 Dec 2020	Healthier Together Executive Group
14 Jan 2021	Healthier Together Executive Group
5 Feb 2021	Healthier Together Executive Group
8 Feb 2021	Informal briefing to JHOSC Chairs
1 March 2021	Informal meeting with JHOSC Chair to prepare for JHOSC meeting
15 March 2021	JHOSC meeting considered the case for change, plans for public consultation and proposed evaluation criteria for decision making

The programme has been integrated with the Local Authorities adult social care services in Bristol, North Somerset and South Gloucestershire. There have been a number of collaboration meetings to develop the ICSS.

Council Scrutiny - Somerset

On 28th April 2021, a meeting with the Chair of the Somerset Scrutiny Committee confirmed that the proposals were not deemed significant service change for the residents of Somerset, due to the small number of people impacted by the proposed changes. It was agreed that, as part of the public consultation, the BNSSG Stroke Programme would reach out to local Councillors and Town and Parish leaders in the North of Somerset to ensure that they were appraised of the changes and able to feedback their views on the proposals. The BNSSG Stroke Programme will then attend a Somerset Scrutiny Panel meeting in public in September 2021 to receive informed feedback from all members.

Council Scrutiny – overarching responsibilities

Regulation 23(1) of the Local Authority (Public Health, Health and Wellbeing Boards and Health Scrutiny) Regulations 2013 states that:

“where a responsible person (“R”) has under consideration any proposal for a substantial development of the health service in the area of a local authority (“the authority”), or for a substantial variation in the provision of such service, R must—

- (a) *consult the authority;*
- (b) *when consulting, provide the authority with—*
 - (i) *the proposed date by which R intends to make a decision as to whether to proceed with the proposal; and*
 - (ii) *the date by which R requires the authority to provide any comments under paragraph (4);*

- (c) *inform the authority of any change to the dates provided under paragraph (b); and*
- (d) *publish those dates, including any change to those dates.”*

In order to comply with Regulation 23, at the point of launching the public consultation, the BNSSG Stroke Programme will write to the relevant local authorities with a copy of the consultation document detailing the date by which a decision will be made, and the date by which a response to the proposals is required from the JHOSC.

NHSEI

NHSEI has been involved in the BNSSG Stroke Programme, with regular meetings to share progress and secure input. In accordance with best practice guidelines, NHSEI undertake assurance of the plans for consultation and the models of care for the future. This process consists of:

- **A strategic sense check (Stage 1)** which examines the Case for Change and the level of consensus for change (completed on 18th March 2020, the feedback letter can be seen in Appendix 12).
- **Review of early feedback from South West Clinical Senate.** The Senate provides independent, strategic clinical advice and leadership to all commissioners across the South West geographical area. It is a non-statutory advisory body with no executive authority or legal obligations and it therefore works collaboratively and objectively across the health system. The South West Clinical Senate provides NHSEI with an independent review of clinical elements of the plans for service change. A desktop review of the proposals for change was undertaken in March 2020 (this can be seen in Appendix 13).
- **Clinical Senate Review Panel.** A formal Clinical Review Panel (CRP) held to scrutinise and support the development of the proposals in order to assure the clinical model and the changes to inpatient capacity proposed as part of the changes. The CRP was held on 27th January 2021 and the proposals for change were given full assurance; the clinical model was found to be evidenced based and the CRP deemed the clinical changes ready to proceed to consultation with the public.
- **Stage 2 assurance** is NHSEI’s formal assurance of proposals for consultation, including review of the consultation plan and draft consultation document. The Stage 2 Assurance meeting was held on 25th February 2021. Table 59 provides an overview of the outcome of the Stage 2 Assurance meeting. A further meeting to confirm that all the Stage 2 requirements have been met was held on 10th May 2021. The full report from NHSEI can be seen in Appendix 17: NHSEI gave full assurance to the proposals on 20th May 2021 and confirmed that BNSSG CCG’s Governing Body could now make a decision to proceed to public consultation on the proposed changes.

Table 59 - Summary of outcome of the NHSEI Stage 2 Assurance meeting

Following consideration of the evidence presented and discussion at the assurance meetings held on 25 February and 10 May 2021, this scheme is Fully Assured against the four Key Tests, NHS England Patient Care “Beds Test”, Finance and Other Best Practice requirements:

Test	Panel finding
Test 1 - Strong Public & Patient Engagement / Stakeholder Engagement	Stage 2 Fully Assured
Test 2 - Consistency with current & prospective need for Patient Choice	Stage 2 Fully Assured
Test 3 - Clear Clinical Evidence Base	Stage 2 Fully Assured
Test 4 - Support from Clinical Commissioners	Stage 2 Fully Assured
Test 5 - NHS Beds Test	Stage 2 Fully Assured
Financial Assurance	Stage 2 Fully Assured*
Implementation Plan	Stage 2 Fully Assured
Other Best Practice Checks	Stage 2 Fully Assured

Notes:

* With regards to the Financial Assurance of these proposals, the Stage 2 Meeting on 25 February 2021 noted that:

- *The community of BNSSG Directors of Finance agreed that the revenue costs of the new service model needed to be within 10-12% of the existing baseline, and that this had been achieved, with the additional potential mitigation of prioritised system funding to ensure the scheme is delivered.*
- *System savings of £0.5m have been agreed as part of the financial position to address overhead growth.*
- *The financial case does not assume any capital expenditure, including on estates with the intention being to use existing estates capacity.*

NHSEI’s Planning, Assuring and Delivering Service Change for Patients⁹³ (updated 2018) describes how proposals for service change must demonstrate that they satisfy the five tests of service reconfiguration and are affordable in capital and revenue terms. The tests are:

- **Test 1 - Strong public and patient engagement** - working to reach as many people as possible, put the proposals forward in a clear and comprehensible way and listen and respond to people throughout the process.
- **Test 2 - Consistency with current and prospective need for patient choice** - must be able to demonstrate that patients, residents and other stakeholders have understood how and why the proposals will benefit them and offer a better way forward for their healthcare needs.

⁹³ Planning, assuring and delivering service change for patients - <https://www.england.nhs.uk/wp-content/uploads/2018/03/planning-assuring-delivering-service-change-v6-1.pdf>

- **Test 3 - Clear, clinical evidence base** - The Case for Change must be widely understood and there should be clear, clinical evidence of the benefits of the proposals being consulted on.
- **Test 4 - Support for proposals from clinical commissioners** - must show clear involvement the development of the models/the programme.
- **Test 5 - Assurance with regards to any changes to inpatient bed numbers (bed Modelling)** - This requires that in any proposal including plans to significantly reduce hospital bed numbers NHSEI will expect commissioners to be able to evidence that they can meet certain criteria.

The extent to which this Pre-Consultation Business Case addresses each of these criteria is briefly described in turn:

Strong Patient & Public Engagement

Chapter 5 describes the extensive engagement at the heart of the BNSSG Stroke Programme. Stakeholder engagement started at the beginning of the programme and will continue throughout the process and on an ongoing basis as part of continuous improvement. The programme has undertaken targeted work to specific groups of people affected by stroke, more than 150 people have been involved in events, surveys and ongoing discussions throughout the programme.

The programme has developed a consultation plan to ensure that a wide range of people continue to be reached, including those that may be less likely to take part in consultation activities. This has been developed in line with the Equality Impact Assessment document as shown in Appendix 6.

The Bristol Health Partners Stroke Health Integration Team (HIT) has developed specifically to support the stroke pathway reconfiguration and long term improvement in services, including patient and public involvement. The team comprises of a partnership with: Bristol After Stroke, The Stroke Association, Healthwatch BNSSG, UWE and University of Bristol, Public Health and Adult Social Care organisations, BNSSG CCG including Research and Evidence Team, ARC West, West of England AHSN, NBT and UHBW. The HIT Service User Group and STP Stroke Service User Community are also developing in parallel to support consultation in the region.

The consultation materials are outstanding at Final PCBC Stage but will be developed between March 2021 and the planned launch of the public consultation in June 2021. NHSEI will review the consultation materials and complete the assurance requirements against Test 1 in a further meeting at the beginning of May 2021.

Patient Choice

The BNSSG Stroke Programme recognises the need to consider patient choice and ensuring patients have access to the right treatment, at the right place at the right time. Patient choice and patient experience have been included in the criteria that the BNSSG Stroke Programme used to evaluate the potential options for consultation. These factors will also be explored further through the consultation period which will help to determine the final configuration of services.

Despite the change in travel to an initial site of stroke care for some localities, the centralisation of hyper acute stroke services will enable more rapid assessment,

diagnosis and determination of appropriate non-stroke care pathways, leading to improved outcomes for patients.

Feedback through extensive engagement and co-design with local communities has reinforced the need for a balance between providing a range of choices and the system's ability to deliver the best possible quality of care, with people generally being prepared to travel a further to access better health outcomes and having a good understanding of the evidence base and logic for this. People also felt strongly about the case for improving the equity of services across the region.

People have also identified that care closer to home as part of an integrated network of health and social care is a priority for them, and these proposals will increase patient choice around stroke rehabilitation, supporting people to have greater control over and personalisation of their care, through improved community-based rehabilitation and localised sub-acute rehabilitation. The location of SSARUs will be determined through the consultation process in order to best meet the needs of the BNSSG population. Rurality will also be a factor in determining the number and location of SSARUs, where travel times are a key factor in patient experience.

The BNSSG Stroke Programme has developed a consultation plan to ensure that patients, residents and other stakeholders have understood how and why the proposals will benefit them and offer a better way forward for their healthcare needs. Ongoing engagement activities undertaken since July 2020 are shaping how to present the options and longer term direction of travel in a way that is meaningful and easy to understand.

Clear, clinical evidence base - Case for change

The NHS Long Term Plan sets out clear ambitions from the delivery of stroke care including increasing access to thrombolysis and thrombectomy, and improving post-hospital rehabilitation services. Changing how services are organised will make it possible to meet these ambitions that will ultimately improve patient outcomes and bring greater equity of services to the local population.

The BNSSG case for change has been reviewed by the South West Clinical Senate, NHSEI and other stakeholders. All have noted that there is clear evidence for change across the region. The SW Clinical Senate undertook a desktop review of the proposals in March 2020 and supported the direction of travel. A number of recommendations were made, which have been addressed through the clinical design process, and within the capacity planning and workforce analyses.

A formal South West Clinical Senate Review Panel took place on 27th January 2021 where assurance was provided to the clinical panel. A number of recommendations and observations were provided and the full report is included as Appendix 15. These recommendations have either been addressed in the final PCBC or will be included in the further, more detailed, clinical design work that will inform the Decision Making Business Case.

Support for proposals from clinical commissioners

The clinical options appraisal process has been fully supported by GP commissioners and all other stakeholder organisations that are part of the BNSSG

Stroke Programme. Letters of support from all partner organisations are provided as Appendix 14. The programme has also involved wider primary, community and secondary care clinicians in the review and evaluation of options, and via a number of workshops.

There has been engagement with localities through newsletters and briefings, and through the Primary Care Strategy Group (set up as part of the covid-19 response).

Regular reports have been taken to the CCG Commissioning Executive Committee, comprising of GP's and clinical lead commissioners who have been engaged through the process.

14.3 Information Governance (IG) issues and privacy impact assessment

Following specialist IG advice, the Data Protection Impact Assessment (DPIA) has been drafted on the basis that the current phase of the BNSSG Stroke Programme is focusing on a PCBC and then a consultation process, there should be no change to any patient pathways and patient data flows. At no time will any patient identifiable data be held by the programme.

The data that will be held by the programme during the next phase is as follows:

- Project Management documentation
- Programme Governance documentation
- Consultations documentation and feedback

The current DPIA is presented in Appendix 16 and will be adapted for each the phase of the programme including implementation. The DPIA describes:

- the data, data flows, and retention period
- any data protection and privacy risks identified
- the risk management measures agreed

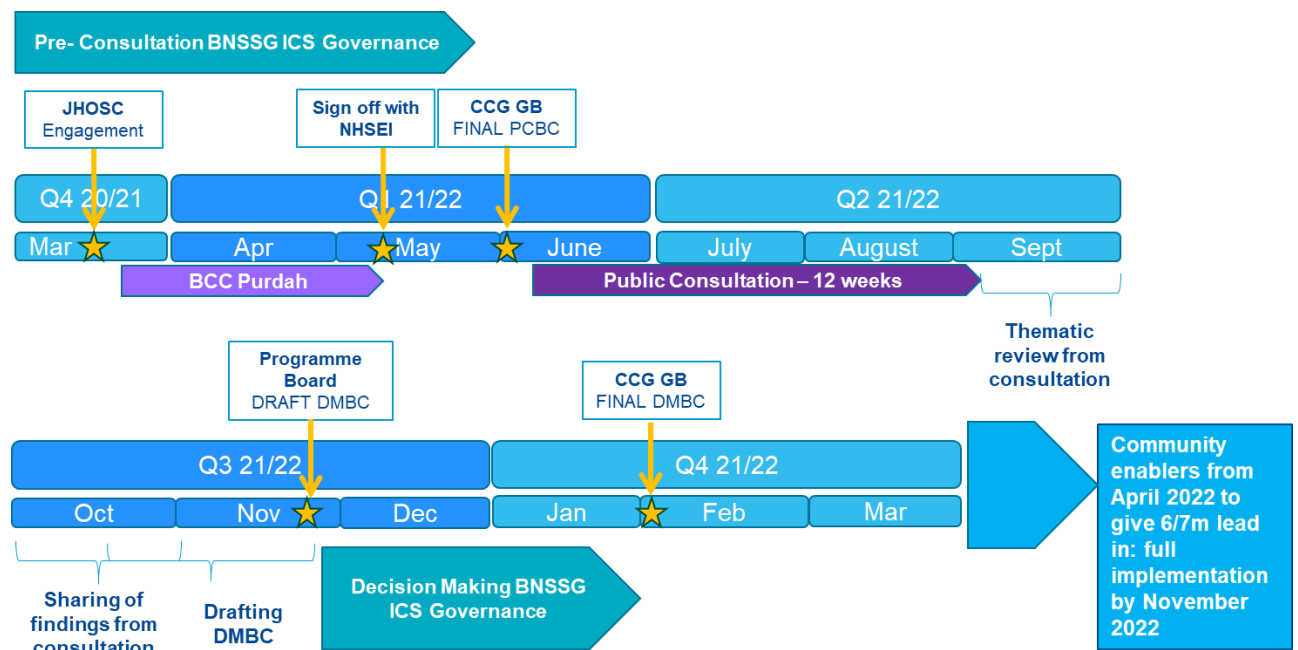
It should be noted that all the proposals that form part of this PCBC do not, at this stage, alter the provider of the services nor are there changes to clinical systems or record keeping specific to the programme. Any changes that occur to provider services as a result of the proposals for change will be confirmed within the Decision Making Business Case and will be subject to a separate DPIA process.

15 Timeline and Implementation Plan

15.1 Timeline for consultation proposals and decision making

As described in Chapter 14, the governance and assurance process for changes of this scale is rigorous. It is anticipated that the work completed within the programme with the wide range of stakeholders will support smooth passage of the proposals for change through the various organisational and system committees, however, this will take time; an overview of the timeline for decision making can be seen in Figure 47 below.

Figure 47 - Timeline for Decision Making



Consultation with the general public is expected to last 12 weeks from June 2021. There needs to be time following this to allow an independent evaluation (conducted by an organisation from outside the BNSSG area) of the findings of the consultation to be completed, and to ensure that this has been shared across the system.

The updated evaluation criteria, which have been reviewed by the Clinical Design Group, the BNSSG Stroke Programme Board and scrutinised by ICS and CCG governance groups, as well as being supported by the BNSSG JHOSC, can be seen in Appendix 18. These will be applied to the decision points in a similar way in which they were used in the design phase of the programme.

Using the feedback from the public consultation, refreshed information on finance, workforce and capacity, travel time and population health data, and clinical evidence, workshops that include the breadth of stakeholders involved in the programme and people with lived experience of stroke care will be established. Representatives will be asked to assess the three decision points that need to be concluded in order for service changes to be implemented across the Healthier Together system:

1. Whether or not there should be a HASU for BNSSG
2. Whether there should be one or two ASUs
3. Where the location of the second SSARU should be

An independent chair will be identified to lead this process and ensure impartiality.

The conclusions from the evaluation process will be presented to the BNSSG Stroke Programme Board, with a recommendation against each decision point. The BNSSG Stroke Programme Board includes representatives from all relevant professions and organisations across the ICS and includes people with lived-experience of stroke and voluntary sector partners (see Appendix 2 for more details). The decision making process and its conclusions, alongside other detailed work on the capacity, workforce, finance and estates solutions associated with the proposals will be detailed in the Decision Making Business Case (DMBC).

Time is allowed for the DMBC to be passed through ISC governance during the winter of 2021/22. The BNSSG Stroke Programme Board's recommendation will be made to the Healthier Together Acute Care Collaboration, as the ICS Transformation Steering Group with responsibility for the BNSSG Stroke Programme. The Acute Care Collaboration will scrutinise the conclusions of the BNSSG Stroke Programme Board, and test and confirm the process used to come to the recommendations being made. This group will also seek assurance from ICS Directors of Finance before making a recommendation to the Healthier Together Executive Group.

The Healthier Together Executive Group is made up of the Chief Executive Officers (CEOs) from all Healthier Together partner organisations. Further to the decision of the Healthier Together Executive Group, the Healthier Together Partnership Board will be asked to assure themselves of the decision making process and conclusions; the Partnership Board includes all system partners CEOs and Chairs. With system agreement, the BNSSG CCG Governing Body, in line with their statutory duties, will be asked to make a final decision to implement the proposals; this meeting is scheduled for February 2022.

15.2 Timeline for service improvements

The timeline for service improvements need not follow the same timeline as the proposals that require formal public consultation. This will accelerate the implementation of ICSS and help enable the hospital changes by releasing the required inpatient capacity for the centralised HASU and adjacent ASU at Southmead Hospital.

Other service improvements on which the proposals for change are not so reliant, such as the digital advancements described in Section 10.5, can be progressed as soon as provider organisations are ready. Improvement through formal programmes of change and learning, have already been taken forward from 2016 into the present within provider organisations to support the implementation of the proposed changes, decrease the length of hospital stays, and widen access to Early Supported Discharge.

Organisations are also working together to develop their workforce and opportunities for joint appointments are being discussed between providers to help transition into a shared working model and give individuals more job security whilst decisions are made regarding this service change.

15.3 Implementation Plan

It is anticipated that implementation of the proposals for change would be provider led and would require a 6 month lead in time from the point of final decision making.

As described above, the establishment of the ICSS is necessary to release the required hospital capacity for HASU care. This component of the pathway therefore needs to be implemented ahead of changes being made to ambulance flows. The proposed implementation plan can be seen in Figure 48 below.

Figure 48 - Proposed Implementation Plan

	2021		2022										2023				
	Nov	Dec	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
Draft Decision Making Business Case to Programme Board	■																
System Governance and sign off of DMBC	■	■	■	■													
Inclusion of financial impact in 22/23 operational planning		■	■	■													
Agreement for ICSS to be established through System Governance				■													
Formal notification of change to commissioning to providers					■												
ICSS recruitment and staff consultation (inclusive of SSARUs)						■	■	■	■								
Establishment of SSARUs									■	■	■						
ICSS "Go Live"									■	■	■	■	■	■	■	■	■
SSARUs open											■	■	■	■	■	■	■
Preparation for changes to hospital provision						■	■	■	■	■	■	■					
New hospital model of care "Go Live"													■	■	■	■	■

It can be seen that the proposals for change will be fully implemented by November 2022, under the current timetable.

15.4 Benefits realisation

The benefits resulting from the new model of care will be achieved as the components of the new stroke service model are established, in line with the above implementation plan. These benefits, their associated drivers and their expected implementation date are presented in Table 60.

Table 60 - Benefits realisation

Benefit	Impact	Driver	Implementation Date
Lower mortality	>12 BNSSG deaths avoided (15 total deaths) annually	24/7 HASU with enhanced nursing ratios and skill mix, plus thrombectomy	November 2022
	A 1% absolute mortality risk reduction across all strokes	Improved access to early neurosurgery due to direct admission to Southmead without the requirement for transfer in from another hospital	November 2022
Improved flow	Seamless pathway: acute/SSARU/ home	24/7 stroke team input at front door	November 2022
		Same Day Emergency Care (SDEC) pathway	Achieved between July & November 2022
		Community in-reach to SSARU	July 2022
		7 day therapy input on HASU, ASU and SSARU to support discharge/transfer	November 2022
		Improved referral processes from acute and SSARU to ICSS [Digital Programme]	TBC – by July 2022
Shift from acute hospital to community care	13/14 bed reduction across pathway 39-40 acute hospital beds no longer occupied	All patients moved home or to SSARU as soon as medically fit for discharge to move care closer to home. No complex discharge planning from acute hospitals	Achieved between July & November 2022
Reduced total inpatient LOS (excluding P3)	7-8 day total inpatient length of stay reduction >10,000 bed days saved	All above	Achieved between July & November 2022
Reduced acute length of stay for stroke	Acute hospital LOS reduced to 7.6 days from 22.2 leading to improved patient experience.	7 day availability of therapy in acute and on SSARU	November 2022
		Level 2b specialist rehab accommodated on SSARU - reduced admissions to BIRU	November 2022
Improved access to thrombolysis and speed of delivery	Meet the Long Term Plan ambition of 20% of all stroke patients receiving thrombolysis.	Improved access to advanced imaging (e.g. CTP imaging) 24/7 on call stroke team at NBT with tele-stroke and Brainomix AI	November 2022
	Improved access to thrombolysis out of hours at UHBW sites.	24/7 access to on call	November 2022

Improved access to thrombectomy and speed of delivery	Meet the Long Term Plan ambition of 10% of all stroke patients receiving thrombectomy	Establishment of 24/7 on call model and HASU enables future expansion of thrombectomy service to 24/7 cover	November 2022
		Direct admission to Southmead Hospital reduces time to treatment	November 2022
Fewer people in nursing homes	reduced disability and preserved independence following a stroke resulting in 57 permanent care home placements for BNSSG residents being avoided each year	Combination of: Establishment of centralised HASU Thrombolysis and thrombectomy Specialist stroke rehabilitation (intensive, needs led, not fixed duration)	November 2022
Improved health and social care integration	Delivery of NHS Long Term Plan for stroke: Health and Social Care Integration	Health and social care staff working within ICSS where appropriate - in development	July 2022
Reduced ED LOS and reduced ED admissions	ED LOS more than halved from 4 hrs to 1-2 hrs	24/7 stroke team input at front door	November 2022
		Ambulance tele-medicine/real-time advice and guidance [HT Digital Programme]	TBC
	ED admissions for stroke reduced	HASU to take direct admissions of unstable patients	November 2022
		Same Day Emergency Care (SDEC) service -early MRI and discharge risk assessment outside ED	November 2022
Reduced TIA clinic attendances	Reduction in Outpatient capacity	SDEC service	November 2022
Reduced utilisation of acute medicine beds	Reduced stroke mimic conveyances to BRI and WGH ED	24/7 stroke team input at front door.	November 2022
	All suspected stroke conveyed directly to Southmead and admitted directly to HASU	SDEC allows rapid diagnosis of mimics and discharge from hospital or to correct service.	November 2022
	Increased Acute Medical Unit admissions for mimics at NBT offset by reduced admission for stroke and early diagnosis and discharge of mimics	Readmission pathway from SSARU to ASU established where required (current pathway at is readmission to general medicine)	July 2022

Increased care at home and independence at home	Improved patient outcomes and ability to support patients at home equitably across BNSSG increases the proportion of patients going home	Combination of improved acute treatment and improved rehabilitation, support, care and self-management	July 2022
Improved quality of life	Service co-designed with people affected by stroke and therefore responsive to people's needs/wishes	The inclusion of Patient Reported Outcome Measures in a BNSSG Outcomes Framework will be used to measure the success of the changes being proposed.	July 2022
Improved patient experience	Service co-designed with people affected by stroke and therefore responsive to people's needs/wishes	Improved voluntary sector support to transition between hospital and home	July 2022
Increased return to work	More people return to work through support, vocational rehabilitation and cognitive rehabilitation	Neuropsychologists within ICSS. Access to stroke specialist OTs. Consistent access to voluntary sector support.	July 2022
Reduced utilisation of highly specialist rehab beds (BIRU)	Earlier discharge from BIRU achieved through ICSS support	Access to components of complex rehab provided equitably through ICSS	July 2022
Reduced acute hospital readmissions	Reduced readmission from home	Voluntary sector supports transition between hospital and home	July 2022
	Reduced readmission from community beds	Remote support for SSARU	July 2022
Improved stroke prevention	Mitigates against growth in stroke incidence from recurrent stroke in ageing population	Support from ICSS and voluntary sector e.g. behavioural change	July 2022
		Improved working with primary care and community pharmacy supported self-management	July 2022
Equality of access to community services	ICSS consistent across BNSSG and not dependent on hospital attendance/admission	Access to intensive community stroke rehab at home and on SSARU for patients living in North Somerset to help tackle current health inequalities	July 2022
	Consistent	Standardised provision of voluntary	July 2022

	voluntary sector offer agreed between Stroke Association and Bristol After Stroke	sector support	
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Benefits realisation will be achieved through careful programme management. This will be operated through the BNSSG Stroke Programme governance structure (as described in Appendix 2) and overseen by the Acute Care Collaboration on behalf of the Healthier Together Executive Group.

16 Conclusion

The BNSSG Stroke Programme has galvanised stakeholders from all backgrounds and professions around a shared vision for stroke care for the future. A single clinical model exists, within which two options for configuring service provision are put forward for consultation with the public.

The clinical model is aligned to the new National Stroke Service Model and supported by NHSEI. It is centred around the needs of the BNSSG population; improving health inequality is at the heart of the changes proposed. Whilst it may appear that centralisation of stroke care will make access harder for those farthest away to gain access to hospital treatment, equity in health outcomes will only be achieved if people living in the most deprived areas of BNSSG are given the same opportunity to access high quality, high tech, interventions as those living on the doorstep of BNSSGs “Comprehensive Stroke Centre”, which, under the proposals for change, will be established at Southmead Hospital.

The proposals will ensure that everyone who could benefit from specialist stroke rehabilitation will receive it, in their own home if possible and in one of two specialist SSARs if inpatient care is required. The ICSS is a step change in provision for the BNSSG communities and, working with the voluntary sector, more people will benefit from specialist stroke support that extends beyond hospital care, removing the “cliff edge” that is currently described following discharge from hospital.

This is an exciting time for stroke care in BNSSG and this Pre Consultation Business Case presents the opportunity for the public to help inform Healthier Together decisions, which will significantly reduce the number of people that experience ongoing disability after a stroke.



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