Developing Regional Stroke Services:

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Purpose and Summary of Document:

This paper seeks the agreement of the Collaborative Executive Group for work to be undertaken by the Collaborative team, in support of the Stroke Implementation Group (SIG), to develop, and prepare a business case to implement a new model of high quality, patient focused stroke services in Wales that will:

- establish Comprehensive Regional Stroke Centres (CRSCs), working across appropriately defined geographies
- establish regional Stroke Operational Delivery Networks (ODNs), centred on the CRSCs, that will incorporate designated Acute Stroke Units (ASUs) and be responsible for the delivery of a comprehensive range of stroke service
- be informed by the experience of improving stroke services elsewhere in the UK and of developing and implementing Major Trauma Networks in Wales
- meet quality standards, and deliver individual and population outcomes, comparable with the best in the UK within five years
- meet the vision set out in the NHS Wales Quality Statement for Stroke

The initial phase of work will result in the development of a business case, by the end of 2022, describing the proposed specific configuration of services and justifying and seeking the required local and central investment from health boards and Welsh Government This will align with the NHS Wales planning cycle for the period commencing 2023/24.

1 The case for nationally co-ordinated activity to support the design and implementation of comprehensive regional stroke networks

Stroke services in Wales face significant challenges. Workforce fragility and lack of key specialist skills mean that treatment and outcomes are often sub optimal. Despite a strong evidence base, informed by experience elsewhere in the UK, indicating how services and outcomes could be significantly improved, very limited progress has been made over many years.

The solution to providing sustainable service models, for both acute and highly specialised treatment, lies beyond individual health boards trying to maintain their own local services. These services are too fragile; they are poorly staffed, lack 24/7 models of care and are not delivered in units designed to treat stroke as a true medical emergency.

This paper proposes a programme of work, to be undertaken by the Collaborative team, working with health boards and in support of the Stroke Implementation Group, that will address how best to organise and deploy existing resources and new investment to address current weaknesses. The programme will undertake the work to design and produce a business case for sustainable service models that delivers the outcomes that the Welsh population deserves.

The case for designing and implementing stroke services in a prudent and optimised way is clear:

- Stroke is estimated to cost NHS Wales £220 million annually and all sectors of the Welsh economy a combined £1.63 billion (£45,409 per patient in the first year). The latter cost is forecast to rise to £2.8bn by 2035 if no action is taken to mitigate against this.
- The thrombectomy rate in Wales is currently only 0.7%. This compares with a target of 10% (equivalent of 750 patients), which, over 10 years, would enable 300 extra patients to live independently per year. A recent study by Guijarro et al demonstrated that utilising thrombectomy for eligible patients represents a saving of £47,000 per patient, over a 5-year period. If Welsh targets are met this equates to a saving of £350 million over the 10-year period.
- The thrombolysis rate in Wales is currently only 11.8%. This compares with a target of 20%, which would deliver an outcome of 110 patients free of disability and would increase by a further 22% (24 patients) if the patients were treated within 90 minutes of the onset of stroke. This equates to 134 patients free of disability per year, 11 patients per month.

- Only 21.8% of patients are currently admitted to stroke units within four hours. Over 11,000 bed days could be saved annually if the target level of 95% was achieved.
- The average length of stay in Wales is currently 21.5 days against a national average across the UK of 16.5 days. High performance 'level A stroke centres' have an average stay of 14.5 days. By achieving the equivalent of those centres, Wales would save 33,901 bed days, a cost saving of £13.56 million.
- The current Early Supported Discharge (ESD) rate is 25.5%, against a target of 60%, with huge variation across Wales. Increasing and meeting an ESD target of just 40% would save 10 lives per year and £51,000 per 100,000 population, saving £479,000 to the Welsh NHS. From a patient perspective, ESD is shown to improve a stroke survivor's motor capacity, improving functional independence and reducing the burden on carers.
- None of the existing Welsh stroke units have consistently scored 'A' in the Sentinel Stroke National Audit Programme (UK) assessment. It is estimated that achieving a SSNAP 'A' score would reduce the 90-day mortality by 5%. An estimated 85 deaths per year could, therefore, be prevented by reaching this standard alone.

Click here to read the Stroke Association's publication; 'Current, Future and Avoidable Costs of Stroke').

In 2016, the Stroke Implementation Group (SIG) jointly commissioned the Royal College of Physicians and The National Institute for Health Research (NIHR) Collaboration for Leadership in Applied Health Research and Care (CLAHRC) South West Peninsula, to provide an analysis of the options for the reconfiguration of hyperacute stroke services in Wales in order to address longstanding issues of sustainability and quality deficiencies, including those summarised above.

The report[1] detailed the net clinical benefit, taking into account institutional activity and co-dependency with other critical services such as vascular and interventional neuroradiology. The model demonstrated that equivalent clinical benefit could be obtained from as few as three **Comprehensive Regional Stroke Centres** (CRSCs) in Wales, provided that those centres consistently achieve an average door-to-needle time[2] of 45 minutes[i], as demonstrated in other CRSCs elsewhere in the United Kingdom. Nearly six

[1] A new hyperacute stroke service for W

[2] **Door-to-needle time**: the time from arrival at hospital door to the start of IVT

years on, Wales has not moved towards these recommendations and so it has been determined that a nationally co-ordinated approach to deliver a model of service in keeping with the rest of the UK is necessary.

2 Defining the vision, model, pathways and minimum viable size of CRSCs

The NHS Wales Stroke Quality Statement states that NHS Wales should:

1. *Support a new model of provision of stroke services through comprehensive stroke centres and a networked approach to cross boundary working that seeks to improve the whole patient pathway including access to diagnostics, interventions, rehabilitation, including early supported discharge and psychological support services.*
2. *Services will be reconfigured to produce the outcomes expected in high quality, patient focused services and to ensure national standards can be met consistently and sustainably.*

In support of this vision, it is proposed that work should be undertaken by the Collaborative team, in support of the SIG, to develop, and prepare a business case to implement a new model of high quality, patient focused stroke services in Wales that will:

- establish Comprehensive Regional Stroke Centres (CRSCs), working across appropriately defined geographies
- establish regional Stroke Operational Delivery Networks (ODNs), centred on the CRSCs, that will incorporate designated Acute Stroke Units (ASUs) and be responsible for the delivery of a comprehensive range of stroke services
- be informed by the experience of improving stroke services elsewhere in the UK and of developing and implementing Major Trauma Networks in Wales
- meet quality standards, and deliver individual and population outcomes, comparable with the best in the UK within five years

As stated in the previous section, a minimum of three CRSCs could service the population of Wales, in terms of viable critical mass. The SIG has considered the following factors in assessing the most appropriate number of CRSCs to serve the population of Wales:

- Travel times[3] for patients (in relation to the targets included in the standards in Appendix 1)
- Critical mass

[3] **Travel time**: the time is takes for a patient to get from the scene of their stroke to the most appropriate care setting for treatment

- Sustainability
- Access to specialist diagnostics
- Workforce requirements
- Cost effectiveness

Taking these factors into account, it is recommended that **four** CRSCs be established. To prevent the South East Wales centre from becoming too large (the largest in the UK), it is advised that two CRSCs be developed in this region (South East and South Central). By ensuring that there are no more than four CRSCs there is the opportunity to utilise the existing workforce to maximise benefit, develop rehabilitation closer to home and keep costs to a minimum. By utilising sites with existing primary PCI there is an opportunity to develop thrombectomy services as part of the service model.

Each CRSC would be the focal point of a regional Stroke **Operational Delivery Network** (ODN), covering the following areas:

- North Wales
- South West
- South Central
- South East

Clear arrangements linking to the above CRSCs and to services in England will need to be determined for the population of Powys, in liaison with the health board.

The model of regional CRSCs operating as part of regional Stroke ODNs has strong parallels with, and will build on, the work done to establish Major Trauma Networks in Wales with an agreement to review continually to ensure they model is configured in the optimum way.

This paper seeks agreement to undertake the work necessary to identify and agree on the necessary configuration and specific location of CRSCs, supported by designated **Acute Stroke Units** (ASUs) as part of Stroke ODNs. As part of this work, there will be a workstream to determine managerial arrangements (particularly where services will be organised across more than one organisation). This will enable a co-ordinated programme of work, with a common 'go live' date for the regional networks, to be formally established.

By the end of 2022, the work will generate a business case describing the proposed specific configuration of services and justifying and seeking the required local and central investment from health boards and Welsh Government. This will align with the NHS Wales planning cycle for the period commencing 2023/24. The case will follow the 'five case model' and will set out:

- the Strategic Case
- the Economic Case
- the Commercial Case
- the Financial Case
- the Management Case

3 Process for determining the future configuration of acute stroke services

In order to devise the most appropriate configuration of CRSCs and ASUs, grouped into regional ODNs, it is proposed that the Collaborative should design, and work with health boards to implement a formal process to:

- allow health boards, individually or in partnership, to put forward 'candidate CRSCs' and 'candidate ASUs'
- determine the criteria against which 'candidate CRSCs' and 'candidate ASUs' will be assessed (based on the NHS England quality indicators set out in Appendix 1)
- enable health boards to self-assess the candidate CRSCs and ASUs against explicit criteria (including assessments of the work and time necessary to meet unmet standards/targets)
- enable the SIG, led by the Stroke Clinical Lead and supported by internal and external expertise, to challenge and confirm the assessments of candidate CRSCs and ASUs
- consider service change interdependencies and ensure that WHSSC and EASC are fully engaged in relation to their commissioned elements
- informed by the above, produce a formal recommendation to the Collaborative Executive Group as to the recommended configuration of specified CRSCs and ASUs, grouped into regional ODNs
- produce recommendations as to the to which standards/indicators need to be met for 'go live' of regional services (day 1) and which could follow once operational for a defined period

The above process will be undertaken by Autumn 2022 and will draw on the similar successful approach taken by the South Wales Major Trauma Programme. The resulting configuration of services will then form the basis of the subsequent business case.

The designation of CRSCs and ASUs should be reviewed after the first year of being operational and completion of national annual stroke peer review

4 Engagement and consultation

The need for informing and engaging communities and their statutory advocacy groups with respect to the designation of CRSCs and the formation of Stroke ODNs is recognised. Health boards will be principally responsible for this through normal processes, supported by the SIG and the Collaborative.

To ensure the consultation process is meaningful, consideration needs to be given to key messages to be shared with the public and the evidence available to support the proposed development of a reconfigured stroke network.

The key messages should include:

- Stroke is a serious life-threatening medical condition that happens when blood flow to the brain is blocked by a clot in an artery, or because a blood vessel has burst in the brain. This leads to damage and the rapid death of brain tissue resulting in long-term disability or death.
- Time is Brain; rapid access to the appropriate diagnostics and interventions can reduce the impact of a stroke and improve the outcomes for the patient.
- A Stroke network is a group of hospitals, emergency services and rehabilitation services, that work together to make sure a patient receive the best care for life threatening or life changing injuries.
- You are more likely to survive and have better outcomes if you have access to a comprehensive regional stroke centre or an acute stroke unit for less acute cases.
- Good stroke care involves getting the patient to the right place, at the right time, for the right care; having accurate imaging investigations and access to thrombolysis and thrombectomy where needed as well as a continuum of high-quality trained nursing support.
- A Regional stroke network normally has one CRSC supported by a number of locally provided ASUs. Rehabilitation and nursing are key components of the stroke network and an essential part of providing high quality stroke care and in achieving good patient outcomes.
- You will go to the most appropriate facility. If you are not seriously ill or have a stroke which does not need the highly specialist services, you will go to a local acute unit.

In light of the key messages, the consultation will ask people to respond to three questions:

1. Do you agree or disagree regional Stroke Networks should be established?
2. Do you agree or disagree that the configuration should be based on the recommendations from an independent panel/report?
3. If we develop regional stroke networks in Wales, is there anything else we should consider?

The timing of the consultation, in relation to the production and consideration of the business case requires further consideration and views are welcomed on this point.

5 Related work

This paper seeks only to describe the specific steps necessary to identify and agree the configuration and organisation of regional Stroke ODNs, focused on CRSCs and incorporating ASUs.

It is, however, recognised by the SIG and the Collaborative that this is only one strand of work that is required as part of a comprehensive approach to reducing the health burden of stroke on the population and on services.

With regards to stroke prevention, since the Stroke Implementation Group supported the 'Stop A Stroke' project, we have seen anticoagulation for AF go up from 72% to 85% across Wales.

Services will need to work with Public Health Wales to consider a nationally co-ordinated approach to hypertension control as there is an unmet need that has been exacerbated by health inequalities. A comprehensive stroke prevention strategy will be required as part of this overall work programme. **9 in every 10 strokes are preventable.**

Public Health Wales will continue to work closely with the Stroke Association and SIG to highlight the importance of recognising early the symptoms of stroke through the FAST campaign. Early treatment not only saves lives but results in a better chance of recovery and a likely reduction in disability.

Rehabilitation services are pressured and must also be strengthened. There are recognised workforce challenges in therapy delivery, with shortages in Speech and Language Therapy and Clinical Psychology. Stroke specialist, Early Supported Discharge (ESD) and community rehabilitation services are in place in only some health boards. Evidence suggests that this is not utilised to its fullest extent, with around one quarter of stroke patients transferred on discharge from hospital to an ESD team. In order to support changes within hyperacute stroke delivery, there is a need to reconfigure acute and community rehabilitation services to address some of these gaps. This can be facilitated by the regional Stroke ODNs proposed above.

Ambulance services are critical in the population being able to receive timely interventions. Alongside public recognition of stroke using the FAST campaign, a model for triage and redirection of flow will need to be developed in conjunction with EASC and the Welsh Ambulance NHS Trust. An opportunity exists to adopt work completed to implement the major trauma programme, as similarities between models mean that there is potential to expand the existing triage tool with which ambulance staff are already familiar.

The reconfiguration of stroke services or re-designation of units will almost certainly require a similar exercise in radiology services to be able support the service model.

6 Resources

The £1m funding allocation for the national Stroke Implementation Group has been secured for a further year (2022/23) and is considered sufficient for the Collaborative and SIG to support health boards with the approach described in this paper up to the point of:

- The agreement of the configuration of regional Stroke ODNs and the designation of CRSCs and ASUs
- The development of a business case in support of the implementation of the proposed new arrangements

In parallel with the work described above, the Collaborative will work with chief executives to lay the ground work for potential central capital and revenue funding (including pump priming funding) in support of the necessary implementation work. The details of the required funding will then form a core element of the business case.

7 Recommendations

The Collaborative Executive Group is invited to:

- Agree with the strategic aim to establish regional Stroke Operational Delivery Networks (ODNs) across Wales, each focused on a Comprehensive Regional Stroke Centre (CRSC) and incorporating an appropriate configuration of Acute Stroke Units (ASUs)
- Agree that there should be four ODNs/CRSCs, serving the following regions:
  - North Wales
  - South West
  - South Central
  - South East

- Commission the Collaborative, in support of the Stroke Implementation Group (SIG), to undertake the work, as described in this paper to:
  - recommend the configuration of regional Stroke ODNs and the designation of specific CRSCs and ASUs
  - develop a business case in support of the implementation of the proposed new arrangements

Appendix – Minimum standards and volumes for CRSCs and ASUs

	Comprehensive Regional Stroke Centre	**Acute Stroke Unit**
Minimum Volume	600 patients	
Travel Times	85% within 30 minutes	
	95% within 45 minutes	
	98% within 60 minutes	
CLINICAL STANDARDS		
Admitted to hyper acute unit within 4 hours of arrival to hospital	95%	95% admission from CRSC within 24hrs of referral
Brain Imaging	48% of patients scanned within 1 hour	
	95% of patients scanned within 12 hours	
Stroke specialist nurse assessment under 30 minutes	95%	
Door to needle thrombolysis	50% - 30 mins	
	90% - 45 mins	
	95% - 60 min	
Swallow screen assessment within 4 hrs	95%	
Patients have assessment by one of PT, OT or SLT within 24hrs of admission.	95%	95% patients receiving the equivalent of at least 45 minutes, 5 days a week of PT, OT & SLT.
Patients complete therapy assessments within 72hrs of admission	95%	
100% stroke consultant review within 24hrs	100%	
Patients receiving mood and cognition screening by discharge		95%
Patients receiving a continence assessment by discharge		100%
Applicable patients receiving a joint health and social care plan on discharge		100%

WORKFORCE REQUIREMENTS ***Please note:*** *therapy workforce recommendations are based on provision of 5-day therapy services and should be adjusted accordingly for units which are delivering 6- and 7-day services. These workforce recommendations may be subject to change in the case of any updates to the UK national clinical guidelines for stroke services.*		
Consultant Stroke Physician	24/7 availability; minimum 8 thrombolysis trained physicians on rota	Consultant led ward round 5 days/week
Specialist nurses for thrombolysis/thrombectomy	24/7	
WTE per bed		
Nurse (WTE Per Bed)	2.9 (80:20) registered: unregistered	1:35 (65:35) registered: unregistered
Whole time equivalent (WTE) per 5 beds		
Physiotherapist	0.73	0.84
Occupational therapist	0.68	0.81
Speech and language therapist	0.34	0.40
Clinical neuro-psychologist/ clinical psychologist	0.2	0.20
Dietician	0.15	0.15
Access to		
Clinical Psychology		X
Oral Health		X
Orthoptics		X
Orthotics		X
Social Worker	X	X
Infrastructure		
Radiology Service (Brain & Vascular Imaging)	24/7	24/7
CT/MRI	X	X
CTA/MRA	X	X
CTP	X	
Doppler Imaging	X	X
Appropriately trained staff in eligibility assessment & administering thrombolysis treatment & referral to thrombectomy	24/7	
Access to neurosurgery, interventional neuroradiology and vascular surgery for appropriate patients	X	
Availability of Angio-suite for future development of thrombectomy locally.	X	

Repatriation/ Patient transfer: • If patient transfer is required from hyper acute to acute care services appropriate pathway protocols are in place and followed	X	
Access to neurosurgery, vascular surgery & endoscopy for appropriate patients	X	X
Rehab facilities (Gym/OT Kitchen)		X
Access to ESD		X