

Hyper Acute Stroke Services

Yorkshire & the Humber

‘Blueprint’

for

Yorkshire & the Humber

Clinical Commissioning

Groups

Strategic Clinical Networks provide an organisational model through which professionals and organisations come together, working across boundaries, to deliver programmes of continuous quality improvement. These programmes contribute to the achievement of better outcomes for patients, and benefit population health, where there is a need for whole system or collective improvement endeavour.

In line with this remit, Yorkshire & the Humber Strategic Clinical Network have been supporting the three sub-regions to undertake a resilience review and develop new models of Hyper Acute Stroke (HAS) services across their footprints. In their [report](#) the Yorkshire & the Humber Clinical Senate requested assurance that there was a single overview of stroke service reconfiguration across the three strands of work.

The 23 Clinical Commissioning Groups (CCGs) agreed the development of a Yorkshire & The Humber blueprint as the mechanism to assure the clinical senate, and other stakeholders, that a Yorkshire and Humber wide view is available to inform and align any further reconfigurations of HAS services across the region. The blueprint highlights the cross boundary impact and issues between the three sub regions programmes, and with the East Midlands Strategic Clinical Network.

Issue date: April 2016

Prepared by: Yorkshire and the Humber Strategic Clinical Network (Cardiovascular Disease) in conjunction with Working Together Programme, Healthy Futures Programme, Humber & North Yorkshire CCGs and the Yorkshire Ambulance Service NHS Trust.

Amendment History:

Version	Date	Amendment History
0.1	7 th March 2016	Based on working group discussions
0.2	23 rd March	Incorporated comments from working group
0.3	27 th March	Incorporated activity numbers into tables
0.4	29 th March	Incorporated YAS data
0.5	30 th March	Final Draft for Sign off by Leadership Group
1.0	31 st March	Final Version for Clinical Senate Review
1.1	1 June	Final Version with Foreword and amendments following Clinical Senate Review

Foreword & Key Messages

The Yorkshire & Humber Strategic Clinical Network was requested by the 23 Clinical Commissioning Groups in Yorkshire and the Humber to produce a blueprint which reflected the three sub regional programmes of work to improve resilience and clinical outcomes in hyper-acute stroke services.

In the course of the consultation, the ambition within the blueprint was challenged by the National Clinical Director and the Yorkshire and the Humber Clinical Senate. The following key messages emerged from the launch event on 13th April 2016 and have been reflected in the recommendations. These require further consideration by the Urgent and Emergency Care Networks when determining the future configuration of stroke services.

- SSNAP performance in Y&H remains disappointing with key metrics not being met: The drivers for change are quality, access and workforce but the resulting system must be financially sustainable
- Urgent & Emergency Care Mandate: Stroke is one of five services expected to deliver 7 days service standards. This will be challenging as the whole system is not working 7 days. Genuine whole pathway 24 hour services are required including early supported discharge at weekends.
- Workforce is a major consideration and needs to cover diagnostic and therapy staff as well as medical and nursing. There is not enough trained staff to cover all current sites – centralisation will provide the most effective model of utilising the existing workforce.
- The number of units should be determined by workforce, geography (travel time) and long term financial viability
- Consideration of whether acute stroke services should be co-located with hyper-acute stroke services is required.
- Activity Levels: The paper describes a range of activity levels. The launch event concluded that an upper threshold of 1,500 confirmed strokes per annum (in line with national guidance) could be a viable option if workforce is centralised. This offers the potential to further reduce the number of hyper-acute stroke services in Yorkshire & the Humber.
- Transformation of hyper-acute stroke services needs to reflect the ambitions of Urgent & Emergency Care Networks in the context of Sustainability and Transformation Plans.



Professor Graham Venables

Clinical Director, Yorkshire and the Humber Clinical Networks

1. Summary Recommendations

- 1.1 The SCN has been requested to provide a high level overview of the three sub-regional programmes intentions regarding reconfiguration of Hyper Acute Stroke (HAS) services, to provide assurance to the Yorkshire and the Humber Clinical Senate and other stakeholders that there is a single coherent view of the direction of travel and the cross boundary impacts. The sub-regional intentions have been reviewed and the viable options considered based on the impact that removing a service would have on clinical activity for surrounding HAS services and travel times for patients. This has resulted in the following recommendations:

Recommendation 1	Based on the current and anticipated clinical activity levels 6-8 HASUs will need to be provided in Yorkshire & the Humber. Each STP footprint will need to consider factors such as workforce, quality outcomes and finance when determining the upper threshold.
Recommendation 2	Further reconfiguration within Humber and North Yorkshire would provide significant challenges in terms of travel times. The existing HASU services will need to demonstrate how they will improve performance and quality.
Recommendation 3	<p>Further reconfiguration within West Yorkshire is considered within the Urgent and Emergency Care Network programme of work to optimise the resilience of the stroke service model. This should include:</p> <p>3a. A plan to reduce the number of HAS services in West Yorkshire and</p> <p>3b. A review of patient flows with potential remodelling across the West Yorkshire geography to ensure that Leeds does not exceed the maximum threshold and the other three sites achieve the minimum activity level and ideally a minimum level of 900 confirmed strokes per annum.</p>
Recommendation 4	<p>4a. South Yorkshire & Bassetlaw reconfiguration options should include consideration of the viability of reducing the number of HAS services to a minimum of two. Transformation should minimise cross-boundary impact, particularly in relation to putting neighbouring HASUs at risk of exceeding the maximum activity threshold.</p> <p>4b. Sites should be chosen to ensure that the travel time metric is achievable with consideration of the total additional activity implications for the ambulance service(s) and the receiving Trust capacity to manage the non-confirmed stroke implications</p>

2. Background

2.1 Historical Reconfigurations

2.1.1 Within Yorkshire & the Humber region there has been considerable work already undertaken towards improving outcomes for stroke including the introduction of a Stroke Assurance Framework in 2009 followed by accreditation visits with external experts.

2.1.2 Prior to the publication of the National Stroke Strategy, individual providers with multiple admitting hospitals undertook internal consolidation to reduce the number of hospital sites admitting acute strokes. Each of the following Trusts centralised their service onto a single site:

- Bradford Teaching Hospitals NHS Foundation Trust
- Calderdale & Huddersfield NHS Foundation Trust
- Leeds Teaching Hospitals NHS Trust
- Mid Yorkshire Hospitals NHS Trusts and
- Sheffield Teaching Hospitals NHS Trust

There have also been, and remain, significant workforce challenges which have also been a major contributor to some of the less resilient services, having to formulate emergency alliances more recently. Over the last ten years there has therefore, been a natural migration towards a reduction in the number of hyper acute stroke units rather than a planned major transformation change programme. However, Stroke Sentinel National Audit Programme (SSNAP) data demonstrates that there still remains unacceptable variation in the quality of services and further work is required in order to achieve consistent high quality services across the region that are resilient in terms of quality and sustainability.

2.2 Recent Large Scale Changes

2.2.1 In 2013, following the Keogh review, North Lincolnshire and Goole (NLAG) centralised hyper acute stroke services on the Scunthorpe site (with hospital bypass for FAST (face, arm, speech, time) positive patients from the Grimsby site). This programme was managed via the Healthy Lives Healthy Futures work programme and supported by the Yorkshire and the Humber [Clinical Senate](#) and local Health and Social Care Overview and Scrutiny Committees. This has led to a significant improvement in SSNAP performance data.

2.2.2 In November 2013 the Healthy Futures work programme in West Yorkshire commissioned a review of the resilience of their HAS services. During this review, in April 2014 Airedale NHS Foundation Trust suffered significant workforce challenges and consequently an emergency alliance was formulated with Bradford Teaching Hospitals NHS Foundation Trust. This alliance has since been consolidated, under review by local Health and Social Care Overview and Scrutiny Committee, into a single service model with Hyper Acute Stroke Unit (HASU) centralised on the Bradford Royal Infirmary

site (and hospital bypass for FAST positive patients from the Airedale site). Early indications suggest that this model is working successfully and is demonstrating improvement in SSNAP performance.

- 2.2.3 In 2015, Scarborough Hospital faced significant workforce challenges and as a result, York Teaching Hospitals NHS Foundation Trust centralised the HAS unit at the York site. Due to the geographical remoteness of the population served by Scarborough and the ambulance transfer time to York, a model which enabled initial assessment and treatment, utilising telemedicine, was adopted with Scarborough continuing to receive FAST positive patients through the Accident and Emergency department (A&E) then subsequently transferred to the HASU at York. As this model is innovative within England it has been overseen by an external advisory panel in addition to the local Health and Social Care Oversight and Scrutiny Committee. Although still very early days, the SSNAP data indicates better performance at the Scarborough site with a small impact on York data due to the time taken for transfer to HASU.

2.3 Proposed Reconfigurations

- 2.3.1 In May 2015, the Commissioners Working Together Programme submitted a case for change to the Clinical Senate that supported transformational change in South Yorkshire Bassetlaw and North Derbyshire. The recommendation of the Yorkshire & the Humber Clinical Senate was to ensure a co-ordinated approach to transformation across the Yorkshire & the Humber footprint in order to understand the cross boundary implications of reconfiguration and manage any potential unintended consequences on other providers.

3. Blueprint for Hyper Acute Stroke Services

3.1 Context

- 3.1.1 In response to the Clinical Senate recommendation above, in November 2015, the 23 Clinical Commissioning Groups (CCGs) across Yorkshire & the Humber approved the development of a Yorkshire & the Humber 'blueprint' for Hyper Acute Stroke Services that would provide a high level overview of potential clinically safe/sustainable services and ensure the best equity of access for the populations served.
- 3.1.2 There is evidence to demonstrate that after a patient has suffered an acute stroke, their outcome can be improved if their care is undertaken in a specialised centre with a higher volume of activity¹. There is a national trend towards more centralised services following the success of the London reconfiguration as highlighted in the Five Year Forward View Plan².

- 3.1.3 The blueprint constitutes a very high level review based solely on clinical activity and access/travel times. It aims to inform the next stages of work in the sub regional programmes and to provide them with a strategic direction of travel in a co-ordinated manner. This is to mitigate against the unintended consequences of transformation in one of the other programmes, in particular South Yorkshire, Bassetlaw and North Derbyshire. This does not replace the need, where appropriate, for individual sub regional programmes to undertake a full detailed review and options appraisal for service change.

3.2 Activity Levels

- 3.2.1 There is growing evidence, based on the London model, that a HASU unit with less than 600 confirmed strokes per annum provides worse outcomes in terms of morbidity, and may be associated with poorer outcomes. Units smaller than this size are also not resilient in terms of workforce and are therefore not recommended as a sustainable service model for the future. A maximum number of 1,500 confirmed strokes per annum has been recommended in the commissioning toolkit³; however, the evidence base for this is not as strong. More recent evidence also suggests that larger units have shorter door to needle times for thrombolysis (clot busting) after arrival at hospital which can offset longer travel times^{4&5}.
- 3.2.2 The 1,500 figure is based on the London service model which is heavily reliant on middle grade doctors. However, in this region, services are predominantly Consultant delivered as there is not the same level of junior doctor support. There is therefore concern that a service admitting 1,500 confirmed strokes per annum would not be clinically sustainable in terms of delivery.
- 3.2.3 The Yorkshire & the Humber Stroke Clinical Advisory Group recommended that a maximum level of confirmed strokes of 1,200 per unit per annum is utilised in order to ensure that the medical, nurse and allied health professional workforce vacancies are attractive to facilitate recruitment and retain staff in post.
- 3.2.4 The Clinical Commissioning Toolkit advocates that the optimal number, based on cost effectiveness, is 900 confirmed strokes per Unit³.
- 3.2.5 Based on the above national debate this paper recommends the following activity metric: **No unit should have a confirmed stroke rate of less than 600 cases per annum. The upper threshold will be determined by a number of factors including workforce, quality outcomes and finance but should not exceed 1,500 cases per annum.**

3.3 Time to Treatment

- 3.3.1 A key issue in hyper acute stroke care is the time to treatment. The current

evidence points to benefits for patients with acute ischaemic stroke being treated with intravenous thrombolysis within a 4.5 hour window from symptom onset, but that a more favourable outcome may be achieved if treatment is delivered within 90 minutes of stroke onset.

- 3.3.2 National guidance⁶ recommends that there is a maximum ambulance call to door travel time of 60 minutes and that 95% of journeys should be achievable within 45 minutes. Yorkshire Ambulance Service provided data to allow scenario modelling to demonstrate the impact on patient flow and travel times if certain hospitals were not to retain a HASU. Isochrone modelling was utilised to inform this high level blueprint, however, there needs to be further postcode modelling to validate the flows in the full options appraisal and more detailed discussions with East Midlands Ambulance Service.
- 3.3.3 It should be noted that Yorkshire ambulance service would prefer that any further reconfigurations are based on a full divert rather than a treat and transfer model.
- 3.3.4 The ambulance quality indicators currently measure the time from ambulance door to arrival at hospital (with the ambition that this equals access to a skilled stroke healthcare professional). Any change to configuration should not incur any detrimental change in the current ambulance Trust performance against Stroke 60. This should be monitored through sub regional programmes.
- 3.3.5 Based on the above considerations this paper recommends the following travel Metric: [Ambulance call to door travel times should not exceed 60 minutes. 95% of journeys should be achievable within 45 minutes.](#)

4. Current Configuration and Performance

4.1 Yorkshire & the Humber Overview

- 4.1.1 The table below demonstrates the current HASU sites within Yorkshire & the Humber and the associated clinical activity levels. In order to ensure confidence in the data, activity has been sourced from both SSNAP and Hospital Episode Statistics (HES) data. The figure used for modelling within the report is based on SSNAP October 14 – September 15 as validated by the Stroke Clinical Expert Group. It is noted that Calderdale and Huddersfield NHSFT recognised an under-reporting into SSNAP within this period.

Table 1. Activity Levels

Provider/Region	HES 14/15	SSNAP 14/15	% Difference	SSNAP Oct14/ Sept 15	SSNAP 15/16*	Figure for modelling	Within Limits
AIREDALE NHS FOUNDATION TRUST	313	300	95.8	309	IN BRADFORD	IN BRADFORD	
BARNSELY HOSPITAL NHS FOUNDATION TRUST	433	472	109	504	529	504	N
BRADFORD TEACHING HOSPITALS NHS FOUNDATION TRUST	503	394	78.3	417	736	726*	Y
CALDERDALE AND HUDDERSFIELD NHS FOUNDATION TRUST	496	479	96.5	444	497	444	N
CHESTERFIELD ROYAL HOSPITAL NHS FOUNDATION TRUST	507	532	104.9	533	483	533	N
DONCASTER AND BASSETLAW HOSPITALS NHS FOUNDATION TRUST	530	567	106.9	615	613	615	Y
HARROGATE AND DISTRICT NHS FOUNDATION TRUST	332	340	102.4	331	351	331	N
HULL AND EAST YORKSHIRE HOSPITALS NHS TRUST	781	779	99.7	759	808	759	Y
LEEDS TEACHING HOSPITALS NHS TRUST	1060	1026	96.8	1085	1025	1085	Y
MID YORKSHIRE HOSPITALS NHS TRUST	802	834	104	850	895	850	Y
NORTHERN LINCOLNSHIRE AND GOOLE NHS FOUNDATION TRUST **	697	902	129.4	873	768	873	Y
SHEFFIELD TEACHING HOSPITALS NHS FOUNDATION TRUST	884	910	102.9	917	941	917	Y
THE ROTHERHAM NHS FOUNDATION TRUST	424	429	101.2	438	423	438	N
YORK TEACHING HOSPITAL NHS FOUNDATION TRUST ***	989	897	90.6	939	940	939	Y
TOTALS	8751	8861		9014	9009	9014	

* Includes Airedale and Bradford sites

** Includes Scunthorpe and Grimsby sites

*** Includes York and Scarborough sites

4.1.2 The Healthy Futures programme in West Yorkshire undertook detailed demographic modelling in order to determine the expected growth in the number of strokes to 2020. The average expected increase for the eleven Clinical Commissioning Groups (CCGs) included was 13%. There was very little variation across the CCGs. The modelling also recognised that there are a number of prevention initiatives underway and plans that could reduce the number of strokes in the future, although some of these will have a much longer lead in time. Based on the West Yorkshire modelling, the current activity levels in the tables below have had a 10% uplift applied to give an indication of the expected impact of demographic growth and prevention initiatives by 2020.

Table 2. Expected Growth by 2020

Provider/Region	Current Activity Levels	2020 Activity Levels (10% uplift)	Impact on Activity Limits
BARNSELY HOSPITAL NHS FOUNDATION TRUST	504	554	N
BRADFORD TEACHING HOSPITALS NHS FOUNDATION TRUST	726	799	Y
CALDERDALE AND HUDDERSFIELD NHS FOUNDATION TRUST	444	488	N
CHESTERFIELD ROYAL HOSPITAL NHS FOUNDATION TRUST	533	586	N
DONCASTER AND BASSETLAW HOSPITALS NHS FOUNDATION TRUST	615	677	Y
HARROGATE AND DISTRICT NHS FOUNDATION TRUST	331	364	N
HULL AND EAST YORKSHIRE HOSPITALS NHS TRUST	759	835	Y
LEEDS TEACHING HOSPITALS NHS TRUST	1085	1194	Y
MID YORKSHIRE HOSPITALS NHS TRUST	850	935	Y
NORTHERN LINCOLNSHIRE AND GOOLE NHS FOUNDATION TRUST *	873	960	Y
SHEFFIELD TEACHING HOSPITALS NHS FOUNDATION TRUST	917	1009	Y
THE ROTHERHAM NHS FOUNDATION TRUST	438	482	N
YORK TEACHING HOSPITAL NHS FOUNDATION TRUST **	939	1033	Y
TOTALS	9014	9915	

4.1.3 The total number of confirmed strokes within the Yorkshire & the Humber footprint is currently 9014 and expected to rise to 9915 by 2020.

4.1.4 Mimics and transient ischaemic attack (TIA) rate (i.e. those patients who present as FAST positive but who do not turn out to have had a stroke) has not been taken into consideration for determining the 'blueprint' but will be required when a full options appraisal is undertaken for modelling the impact of reducing the number of sites. The mimic/TIA rates from other reconfigurations are recorded as between 30-50%.

4.1.5 The table below outlines the potential number of units required across the three geographical footprints in Yorkshire & the Humber modelled on the optimal (900), locally determined upper (1,200) and nationally recommended (1,500) upper threshold based on the predicted 2020 activity levels.

	No. stroke admissions	No. HASU Units (current)	No. Units based on 900	No. Units based on Max 1200	No. Units based on Max 1500
Y&H	9915	13	11	8	6-7
HC&V	2828	3	3	2	2
WY	3780	5	4	3	2-3
SY&B	3307	5	4	3	2

Recommendation 1:

Based on the current and anticipated clinical activity levels 6-8 HASUs will need to be provided in Yorkshire & the Humber. Each STP footprint will need to consider factors such as workforce, quality outcomes and finance when determining the upper threshold.

5. Humber and North Yorkshire

5.1 Current State

5.1.1 There have been two recent re-configurations as outlined in Section 2.2 leaving three HAS units in Humber & North Yorkshire based at:

- Hull and East Yorkshire Hospitals NHS Trust – Hull Royal Infirmary
- Northern Lincolnshire and Goole Hospitals NHS Foundation Trust – Scunthorpe General Hospital and
- York Teaching Hospitals NHS Foundation Trust – The York Hospital

5.2 Recommendations for Future Reconfiguration

5.2.1 All three units are above the minimum clinical activity threshold and near the optimal number of 900 confirmed strokes per annum. The rural geography would not support any further centralisation in terms of travel times.

5.3 Cross Boundary Considerations.

5.3.1 Reconfigurations in South Yorkshire could potentially impact on Scunthorpe; reconfiguration in West Yorkshire could potentially impact on York; reconfiguration in East Midlands (Boston/Lincoln) could potentially impact on Hull. Therefore, the cross boundary considerations on Humber & North Yorkshire will need to be fully integrated into the options appraisal of the relevant programme.

Recommendation 2:

Further reconfiguration within Humber and North Yorkshire would provide significant challenges in terms of travel times. The existing HASU services will need to demonstrate how they will improve performance and quality.

6. West Yorkshire

6.1 Current State

6.1.1 Even before the publication of the National Stroke Strategy, those Trusts within West Yorkshire with multiple admitting hospitals moved to consolidate their HASU provision on a single site. Therefore, the number of HAS units in West Yorkshire has already been significantly reduced over recent years and has been under further review as part of the Healthy Futures programme. There are currently five HASUs in West Yorkshire based at:

- Bradford Teaching Hospitals NHS Foundation Trust – Bradford Royal Infirmary
- Calderdale & Huddersfield NHS Foundation Trust – Calderdale Royal Hospital
- Harrogate and District NHS Foundation Trust
- Leeds Teaching Hospitals NHS Trust – Leeds General Infirmary
- Mid Yorkshire Hospitals NHS Trusts – Pinderfields Hospital

6.2 Recommendations for Future Configuration

6.2.1 The activity modelling suggests that three or four HAS units will be required in the future. The two units not currently achieving the required minimum activity levels are Harrogate and District NHS FT (331 stroke admissions per annum expected 2020) and Calderdale & Huddersfield NHSFT (488 stroke admissions per annum expected 2020).

6.2.2 Further work across the West Yorkshire footprint is recommended to identify the future sites and review patient flows to ensure that:

- Leeds, as the Level 1 comprehensive stroke centre, does not exceed the maximum threshold due to future growth including the potential development of a regional Intra-Arterial Thrombectomy service and
- the remaining sites achieve the minimum activity threshold and ideally the minimum level of 900 confirmed strokes per annum. The Calderdale and Huddersfield Foundation Trust reconfiguration of A&E services will need to be considered as part of the review.

6.3 Cross Boundary Considerations

6.3.1 Reconfiguration in South Yorkshire could potentially have a significant impact on Mid Yorkshire and Calderdale & Huddersfield hospitals with a subsequent knock on effect on Leeds.

Recommendation 3:

Further reconfiguration within West Yorkshire is considered within the Urgent and Emergency Care Network programme of work to optimise the resilience of the stroke service model. This should include:

3a. A plan to reduce the number of HAS services in West Yorkshire and

3b. A review of patient flows with potential remodelling across the West Yorkshire geography to ensure that Leeds does not exceed the maximum threshold and the other sites achieve the minimum activity level and ideally a minimum level of 900 confirmed strokes per annum.

7. South Yorkshire, Bassetlaw and North Derbyshire

7.1 Current State

7.1.1 There are currently 5 HASUs in South Yorkshire & Bassetlaw (including Chesterfield) based at:

- Barnsley Hospital NHS Foundation Trust
- Chesterfield Royal Hospital NHS Foundation Trust
- Doncaster & Bassetlaw NHS Foundation Trust – Doncaster Royal Infirmary
- Sheffield Teaching Hospitals NHS Foundation Trust – Royal Hallamshire Hospital
- The Rotherham Hospital NHS Foundation Trust

7.2 Future Configuration

7.2.1 The activity modelling suggests that a reduction in HAS units is required in the future. Three units do not currently achieve the required minimum activity levels namely Barnsley (554 stroke admissions expected in 2020) Chesterfield (586 stroke admissions expected in 2020) and Rotherham (482 stroke admissions expected in 2020).

7.2.2 Transformation within South Yorkshire & Bassetlaw has been supported by the Clinical Senate. The SCN have worked closely with the Yorkshire Ambulance Service NHS Trust to model scenarios in order determine the impact on patient flows, activity in neighbouring units and travel times if there was no longer HASU provision at an individual site.

7.2.3 Yorkshire Ambulance Service has undertaken the modelling based on a 45 minutes travel time from 'door' to the hospital. This allows 15 minutes for the ambulance to respond to the call. It has been assumed that approx. 85% of strokes are admitted from a 999 call.

7.3 Sheffield Teaching Hospitals NHS Foundation Trust

7.3.1 Sheffield is the Level 1 comprehensive stroke centre and provides neurological support for the region. On this basis, it has been assumed that Sheffield will continue providing a HAS service. The HASU at Sheffield is currently sited at the Royal Hallamshire Hospital and this has been utilised for modelling travel times.

7.4 Impact of no HASU provision at Barnsley Hospital NHS Foundation Trust

7.4.1 The modelling undertaken suggests that the loss of HASU at Barnsley would lead to a diversion of 554 confirmed strokes by 2020. The ambulance density map (appendix A) indicates that the largest incidence of strokes (approx. 50%) occur South West of the town centre and could be diverted to Rotherham or Doncaster. The remainder would predominantly be redirected to Pinderfields (approx. 45%) and Sheffield HASU site (approx. 5%). The table below shows the estimated impact on neighbouring HASUs.

Table 3: Impact of no HASU at Barnsley: Scenario One

Barnsley	Confirmed strokes expected in 2020		554			
	Expected Impact	Chesterfield	Doncaster	Rotherham	Sheffield	Pinderfields
Clinical Activity	% redirected	0%	50%	0%	5%	45%
	Number	0	277	0	27	249
	Impact on activity levels	586	954	482	1036	1184
Travel times	Achievable within 45 minutes	n/a	Y	Y	Y	Y
Total number of ambulance incidents*		The total no. of ambulance incidents based on a FYE of 10 months 15/16 data = 829				

Table 4: Impact of no HASU at Barnsley: Scenario Two

Barnsley	Confirmed strokes expected in 2020		554			
	Expected Impact	Chesterfield	Doncaster	Rotherham	Sheffield	Pinderfields
Clinical Activity	% redirected	0%	0%	50%	5%	45%
	Number	0	0	277	27	249
	Impact on activity levels	586	677	759	1036	1184
Travel times	Achievable within 45 minutes	n/a	Y	Y	Y	Y
Total number of ambulance incidents*		The total no. of ambulance incidents based on a FYE of 10 months 15/16 data = 829				

7.4.2 The loss of a HASU at Barnsley would have cross-boundary implications for Pinderfields HASU. The ability to alleviate the pressure at Pinderfields by redirecting flows within West Yorkshire is limited due to Leeds HASU currently being near maximum capacity.

7.4.3 There would not be an adverse impact on the activity in Sheffield.

7.4.4 Travel times. YAS isochrone modelling (Appendix B) suggests that diversions to Doncaster, Rotherham, Pinderfields and Sheffield are all within the 45 minute travel time.

7.5 Impact of there being no provision of HASU at Chesterfield Royal Hospital NHS Foundation Trust

7.5.1 The modelling undertaken suggests that the loss of the HASU at Chesterfield would lead to a diversion of 586 confirmed strokes by 2020. The full impact cannot be assessed without further impact from East Midlands Ambulance Service. SSNAP indicates that 60% of the current activity is from Hardwick and North Derbyshire CCGs and a significant proportion of that flow would be directed North rather than South. This would predominantly be redirected towards Sheffield HASU. There is currently a HASU at Sherwood Forest Hospital where patients could also be redirected; however, the East Midlands review may mean that the nearest HASU site becomes Nottingham which would incur longer travelling times.

7.5.2 The loss of a HASU at Chesterfield could significantly impact on Sheffield.

7.5.3 Travel times. YAS isochrone modelling (Appendix B) suggests that diversions to Sheffield would be within the 45 minute travel time. Other flows cannot be confirmed without EMAS data.

7.5.4 The viability of losing HASU at Chesterfield cannot be considered in isolation of the East Midlands review.

7.6 Impact of there being no provision of HASU at Doncaster & Bassetlaw NHS Foundation Trust

7.6.1 The modelling undertaken suggests that the loss of HASU at Doncaster would lead to a diversion of 677 confirmed strokes by 2020. The ambulance density map (Appendix A) indicates that the largest incidence of strokes (approx. 40%) occur in South of Doncaster and would be diverted to Rotherham. Approx. 35% of strokes occur in the North West and would be diverted to Barnsley with the remaining 25% in the North East being redirected to Scunthorpe. The table below shows the estimated impact on neighbouring HASU.

Table 6: Impact of no HASU at Doncaster

Doncaster	Confirmed strokes expected in 2020			677		
	Expected Impact	Barnsley	Chesterfield	Rotherham	Sheffield	Scunthorpe
Clinical Activity	% redirected	35%	0%	40%	0%	25%
	Number	237	0	271	0	169
	Impact on activity levels	791	586	753	1009	1129
Travel times	Achievable within 45 minutes	Y	n/a	Y	Y	Y
Total number of ambulance incidents*		The total no. of ambulance incidents based on a FYE of 10 months 15/16 data = 1294				

7.6.2 The loss of a HASU at Doncaster would have cross boundary implications for Scunthorpe.

7.6.3 The impact on Rotherham and Barnsley would be to bring both Units above the minimum activity threshold. Chesterfield would remain below the minimum threshold.

7.6.4 Travel times. YAS isochrone modelling (Appendix B) suggests that diversions to Rotherham, Barnsley and Scunthorpe would be within the 45 minute travel time. It should be noted that NLAG is out of area for YAS.

7.7 Impact of there being no provision of HASU at The Rotherham Hospital NHS Foundation Trust

7.7.1 The modelling undertaken suggests that the loss of HASU at Rotherham would lead to a diversion of 482 confirmed strokes by 2020. The ambulance density map (Appendix A) indicates that the largest incidence of strokes occur in the North East and would predominantly be redirected towards Doncaster (approx. 70%) with the remainder being redirected to Sheffield (approx. 30%). The table below shows the estimated impact on neighbouring HASU.

Table 7: Impact of no HASU at Rotherham

Rotherham	Confirmed strokes expected in 2020	482				
	Expected Impact	Barnsley	Chesterfield	Doncaster	Sheffield	Cross boundary
Clinical Activity	% redirected	0%	0%	70%	30%	0%
	Number	0	0	337	145	0
	Impact on activity levels	554	586	1014	1154	n/a
Travel times	Achievable within 45 minutes	n/a	n/a	Y	Y	n/a
Total number of ambulance incidents*		The total no. of ambulance incidents based on a FYE of 10 months 15/16 data = 876				

7.7.2 The loss of a HASU at Rotherham would not have any cross-boundary implications.

7.7.3 Travel times. YAS isochrone modelling (Appendix B) suggests that diversions to Doncaster and Sheffield would be within the 45 minute travel time.

7.8 Recommendations re Future Configuration

7.8.1 Based on clinical activity (current and projected) the case for considering reconfiguration in South Yorkshire is supported. The Working Together programme is recommended to review patient flows to ensure that:

- All remaining HASU sites should achieve the minimum activity threshold and ideally a minimum level of 900 confirmed strokes per annum.
- The maximum clinical activity threshold level is determined in consideration of additional factors including workforce, quality outcomes and finance.
- The cross boundary implications are considered to ensure that redirection of patients flows does not put neighbouring units at risk of exceeding the maximum clinical threshold.

Recommendation 4:

4a. South Yorkshire & Bassetlaw reconfiguration options should include consideration of the viability of reducing the number of HAS services to a minimum of two.

Transformation should minimise cross-boundary impact, particularly in relation to putting neighbouring HASUs at risk of exceeding the maximum activity threshold.

4b. Sites should be chosen to ensure that the travel time metric is achievable with consideration of the total additional activity implications for the ambulance service(s) and the receiving Trust capacity to manage the non-confirmed stroke implications.

8. Assumptions

8.1 Service Models

8.1.1 There are a number of assumptions that have been incorporated into the blueprint including:

- Robust repatriation and contingency planning policies are in place (Appendix C&D)
- Comprehensive in hospital and community rehabilitation /ESD services in place
- Providers move towards single service models to ensure seamless pathways for patient and to minimise the risk to resilience from the national shortage of workforce
- Services are developed to be compliant with the expected national service specification (under development)
- For modelling purposes the hospital sites remain unchanged.
- Humber and North Yorkshire reconfiguration has been undertaken and no further changes are expected.
- The outcome of the East Midlands Review required confirmation.
- Any new models will factor into the options appraisal the financial implications across the health economy including the ambulance service

8.2 Intra Arterial Thrombectomy (IAT) Service Development

8.2.1 Current evidence suggests that Intra-arterial thrombectomy (IAT) is anticipated to be the appropriate intervention for approx. 10-20% of strokes. For modelling purposes it has been assumed that a roll out of intra-arterial thrombectomy (IAT) in Yorkshire and the Humber will be on the basis of initial assessment in the local HASU, with transfer to a Level 1 comprehensive stroke centre where appropriate, for intervention and then a relatively rapid repatriation to the home HASU. Therefore, although there will be some impact on HASU capacity at the Level 1 centres, this service model will not affect the overall workload of the other HASUs.

9. Next Steps

9.1 The Strategic Clinical Network has developed this blueprint to bring together a single overarching view with regards to HAS services within Y&H and to provide a steer to the sub-regional programmes with regards to the cross boundary implications where further reconfiguration is being considered. This was as a direct response to the recommendations from the Clinical Senate. Next steps include;

9.2 Clinical Senate Review

9.2.1 The Clinical Senate have undertaken a further review of the blueprint to specifically consider:

- (i) The metrics and evidence utilised to develop the blueprint and if the recommendations stand up to scrutiny
- (ii) The principles to be adopted by programmes when considering further re-configuration. (Appendix E)

9.3 Urgent and Emergency Care Networks

9.3.1 Cardiovascular disease (CVD) transformation will be transferred from Strategic Clinical Networks to Urgent and Emergency Care Networks with effect from 1 April 2016. NHS England and CCGs should ensure that the recommendations within this paper will be taken forward through this vehicle

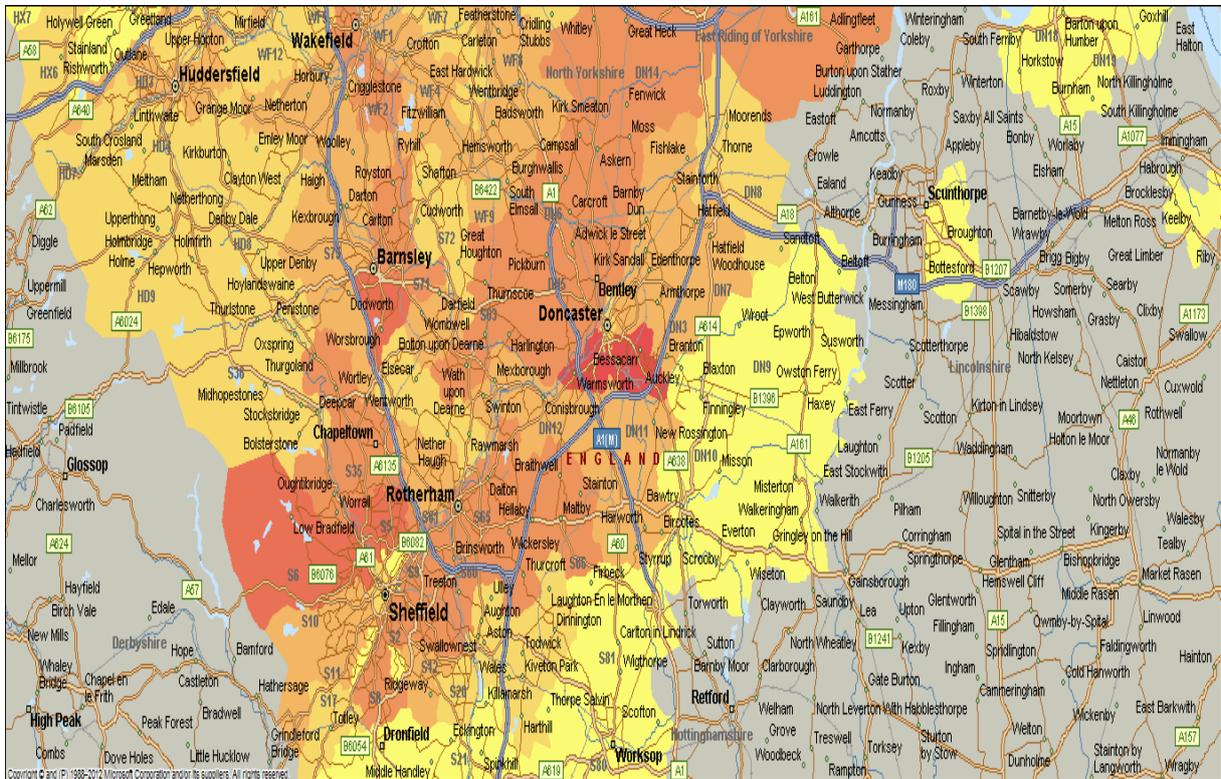
9.4 Coordinated Programme Management

9.4.1 Due to the cross boundary implications of the South Yorkshire configuration and potential West Yorkshire, it is recommended that a single Steering Group (responsible to UEC Networks) is developed to ensure co-ordination of further re-configuration through a single programme management function and an integrated approach to the service model for Intra Arterial Thrombectomy.

10 References

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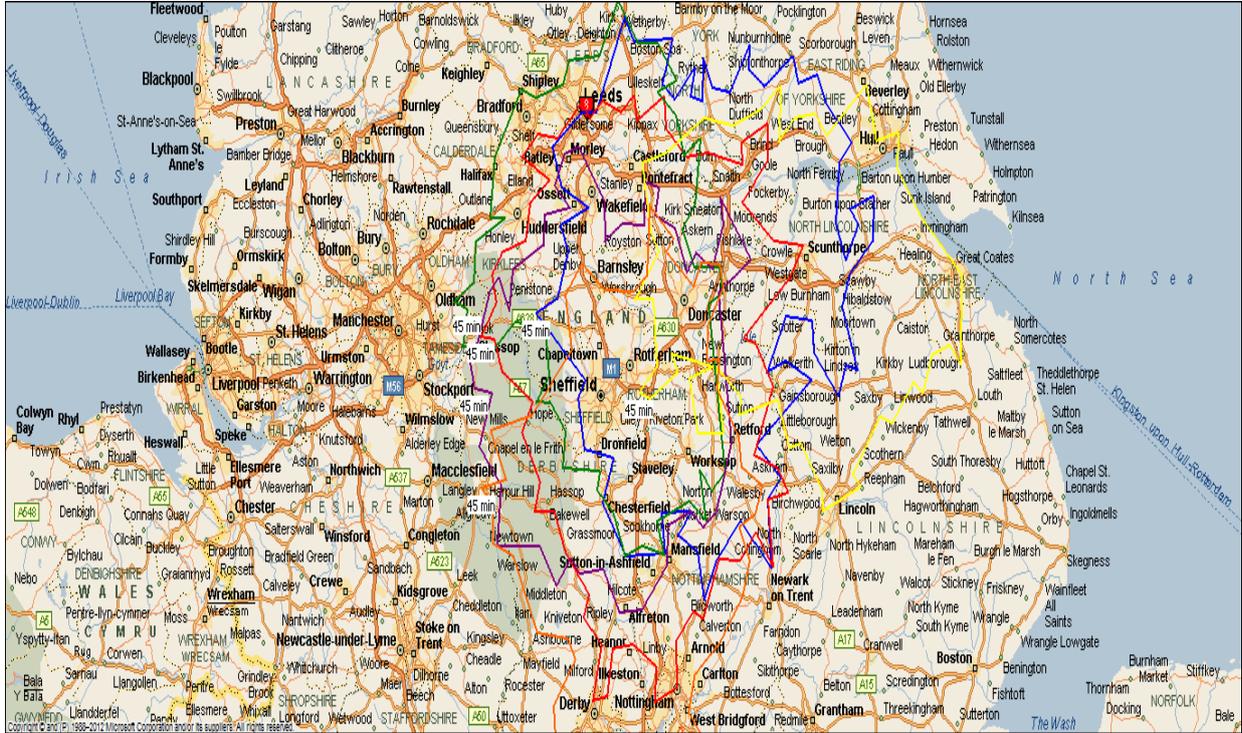
Appendix A: Yorkshire Ambulance Service. Density of Stroke Incidents Jan – Dec 2015



Key: stroke incidents

- 250 to 300
- 200 to 249
- 150 to 199
- 100 to 149
- 50 to 99
- 0 to 49

Appendix B: Yorkshire Ambulance Service. 45 Minute Travel Time Isochrones.



Key: coloured lines depict the coverage of the following HASU within 45 minutes

Green	Barnsley
Orange	Chesterfield
Blue	Doncaster
Red	Rotherham
Purple	Sheffield
Yellow	Scunthorpe

Appendix C: Repatriation Policy



FINAL Hyper Acute
Stroke Service Repatriation

Appendix D: Contingency Framework



FINAL Hyper Acute
Stroke Service Contingency

Appendix E: Principles

In addition to the activity and travel metrics utilised for developing the blueprint the following principles require further consideration as part of and further detailed options appraisal/modelling conducted at sub-regional level:

(i) Bed base

Capacity should be modelled on an 85% bed occupancy rate.

(ii) Length of Stay

The national average (median) length of stay for bed modelling is 13 days. 3 days in HASU and a further 10 days in ASU.

(iii) Impact on ambulance journeys

A full divert model would be the preferred model from Yorkshire Ambulance Service

(iv) Mimic / TIA Rates

Mimic/TIA rates of 50% should be utilised for modelling activity to determine the impact on surrounding units. Approx 85% of these may involve one or more ambulance journeys.

(v) Repatriation

All providers require a robust repatriation policy. There should be immediate repatriation of mimics/TIA to the local hospital

Repatriation from HASU should occur after 3 days in the majority of cases. Modelling should factor in a 30% death or direct discharge from HASU.

(vi) The Impact on Patients and Visitors

Each sub-regional programme will conduct patients and public consultation as appropriate

(vii) Finance

A system wide approach to the financial model, led by the commissioners, should be taken. The guidance in the finance chapter from the draft national toolkit is recommended for this purpose.

Appendix F: Summary Y&H Resilience Review 2015



Quality
Appendices.pptx