



Cardiac and Stroke Networks in Lancashire & Cumbria

An outline Business Case to support the development of 24/7 Acute Stroke Thrombolysis in Lancashire and Cumbria

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September 2009

Introduction

At the request of the Cardiac & Stroke Network Board the Network Team has prepared an outline Business Case to support the development of 24/7 thrombolysis in Lancashire & Cumbria.

This case identifies the background to thrombolysis in acute stroke, the current position in Lancashire and Cumbria and outlines the costs, risks and benefits of five options for commissioners. The paper recommends that a full business case for a local Telestroke solution is submitted through the Collaborative Commissioning Board in October 2009.

This report will

- Highlight the crucial role of raising patient and public awareness of the symptoms of stroke
- Make the local case for the introduction of 24/7 thrombolysis in Lancashire and Cumbria
- Provide an options appraisal of the ways this could be commissioned
- Make a recommendation to commissioners
- Estimate timescales for implementation
- Identify ways of measuring the effectiveness of a 24/7 service

National Stroke Strategy

Stroke is the third largest cause of death in England and is the single largest cause of adult disability. Nationally stroke costs the NHS and the economy £7 billion a year: £2.8 billion in direct costs to the NHS, £2.4 billion of informal care costs (e.g. the costs of home nursing borne by patients' families) and £1.8 billion in income to lost productivity and disability. Stroke contributes to the gap in life expectancy between the most deprived areas and the population as a whole. People from certain ethnic minorities i.e. South Asian are at higher risk of stroke.

Stroke has a devastating and lasting impact on the lives of people and their families. Individuals often live with the effect for the rest of their lives. A third of people who have a stroke are left with long term disability.

Outcomes in the UK compare poorly internationally, despite our services being among the most expensive, with unnecessarily long lengths of stay and high levels of avoidable disability and mortality ¹.

At the end of 2007 the Department of Health launched the National Stroke Strategy² setting an ambitious plan for world class stroke services. The strategy outlined very clear guidance relating to the management of acute stroke.

A key component of the patient journey is public and professional recognition of stroke symptoms and the recent national DH FAST campaign has raised the understanding of stroke as a medical emergency and the public expectation that a stroke will be treated as such.

QM1

- Members of the public and health and care staff are able to recognise and identify the main symptoms of stroke and know it needs to be treated as an emergency.

1.9 million neurons are lost for each minute a stroke goes untreated. Every stage of the journey is therefore critical. Thrombolysis for stroke must start within three hours of the onset of the stroke symptoms and after prior exclusion of intracranial haemorrhage by means of appropriate imaging (usually CT scan). Currently it is expected that 10% of patients with an acute stroke should be eligible for thrombolysis, although some centres have achieved higher percentages when accompanied by awareness raising efforts.

Thrombolysis is currently the only approved medical therapy for patients with acute ischaemic stroke and is recommended as the first line treatment by national and international stroke experts. Intravenous treatment of ischaemic stroke with alteplase within a 4.5 hour time window of stroke onset has been shown to be safe and effective in randomised control trials, although the drug is currently licensed to 3 hours. Studies have shown that patients who receive thrombolysis are at least 30% more likely to have little or no disability at 3 months than those who did not receive this treatment.²

The following quality markers are explicit in the National Stroke Strategy.

QM7

- All patients with suspected acute stroke are immediately transferred by ambulance to a receiving hospital providing hyper-acute stroke services (where a stroke triage system, expert clinical assessment, timely imaging and the ability to develop intravenous thrombolysis are available throughout the 24-hour period).

QM8

- Patients with suspected acute stroke receive an immediate structured clinical assessment from the right people.
- Patients requiring brain imaging are scanned in the next available scan slot within usual working hours, and within 60 minutes of request out-of-hours with skilled radiological and clinical interpretation being available 24 hours a day.

NICE Clinical Guideline 68 - Stroke was published in 2008 and recommended thrombolysis as a clinically and cost effective treatment for acute ischaemic stroke.

RCP National Clinical Guideline for Stroke was published simultaneously and includes the delivery of thrombolysis.

It is expected that included in the North West Stroke Plan will be the commitment that by 2012 there will be 24/7 access to thrombolysis across the health economies to increase the proportion of patients receiving thrombolysis. (**Pledge 8 Draft North West Stroke Plan**).

Vital Signs

The operating framework for 2009/10 includes the national requirement for PCTs to implement the National Stroke Strategy.

Care Quality Commission Indicators for Stroke Care

- 90% of the stay for a stroke admission to be on a stroke unit
- An unweighted average of scores for 8 key indicators from the National Sentinel Audit of Stroke

The Current Situation in Lancashire & Cumbria

Each year in Lancashire and Cumbria about 4000 patients will have a stroke and about 1200 will have a stroke-like episode for which an alternative diagnosis is eventually reached. This figure is not SMR adjusted and will in fact be higher. The tables below show hospital admissions by PCT for the previous two years for all stroke and for ischaemic stroke. Achieving a 10% thrombolysis rate of all strokes would mean 400 patients receiving this therapy, last year only 20 patients in the Network received thrombolysis - a rate of just 0.05%.

All Stroke Spells

Registered PCT	2007/08	2008/09	2007/08 Cost	2008/09 Cost
Blackburn with Darwen	329	361	£1,328,831.00	£1,458,079.00
Blackpool	309	328	£1,248,051.00	£1,324,792.00
Central Lancs	684	714	£2,762,676.00	£2,883,846.00
Cumbria	1071	1225	£4,325,769.00	£4,947,775.00
East Lancs	713	824	£2,879,807.00	£3,328,136.00
North Lancs	681	779	£2,750,559.00	£3,146,381.00
Total	3,787	4,231	£15,295,693.00	£17,089,009.00

(I60-I69) Cerebrovascular Diseases
Tariff used £4039

Patients are currently admitted across eight geographical sites. These are

Royal Blackburn Hospital

Royal Lancaster Infirmary

Royal Preston Hospital

Furness General Hospital

Chorley and South Ribble District General

West Cumberland Hospital

Blackpool Victoria Hospital

Cumberland Infirmary

The area is served by North West Ambulance Service.

In the population of Lancashire and Cumbria (1.926 million) it can be expected that there will be:

- 100 patients per week (if everyone is referred/attends hospital – most will present between 6 am and 11 pm).
- Virtually all will require brain imaging – more than half as a matter of urgency.

Where thrombolysis is not available or after 5 pm CT scans are not undertaken as an emergency unless patients are suspected to have had a haemorrhagic stroke (e.g. the patient is on anticoagulant therapy). However all patients who are suspected to have had a stroke will have a CT scan carried out within the first 24 to 72 hours after admission. There is robust evidence that immediate imaging increases independent survival and reduces cost of stroke³.

Currently thrombolysis in acute stroke is delivered in three of the eight acute sites in Lancashire and Cumbria receiving stroke patients. This is currently delivered on a 9 -5, Monday to Friday basis only, and is compromised by annual leave and study leave requirements. All Acute Trusts within the Network have plans to deliver a 9-5 service but no sites have more than three stroke physicians and will find it difficult to deliver a sustainable rota for 24 hour thrombolysis independently without a significant expansion of consultant numbers. Advice from other thrombolysing centres indicates that up to 50% of patients are likely to present out of hours.

Network-wide Standards for Thrombolysis for Lancashire and Cumbria were ratified in January 2009 to support the safe implementation of thrombolysis services.

National Sentinel Audit for Stroke

Results for this audit show a lower level of organisational performance in Lancashire and Cumbria Stroke Units than in the North West as a whole.

Potential Cost Savings Associated with 24/7 Thrombolysis

In 2005 the National Audit Office⁴ calculated that by achieving a 9% thrombolysis rate net savings to the NHS alone of over £16 million in care costs. However the main economic burden of stroke is in the cost of rehabilitation and long term disability.

The main evidence base for stroke thrombolysis comes from the SITS-MOST study⁵. Using the outcomes from this study we have modelled the potential savings of thrombolysing the 400 eligible patients in Lancashire and Cumbria.

The **modified Rankin Scale (mRS)**⁶ is a commonly used scale for measuring the degree of disability or dependence in the daily activities of people who have suffered a stroke, and it has become the most widely used clinical outcome measure for stroke clinical trials.

Proportion of patients with modified Rankin score of 0-6 at 3 months in SITS MOST and in a pooled randomised controlled trial for placebo patients.

The Modified Rankin Scale (mRS)						
1	2	3	4	5	6	7
No symptoms	No significant disability. Able to carry out all usual activities, despite some symptoms.	Slight disability. Able to look after own affairs without assistance, but unable to carry out all previous activities.	Moderate disability. Requires some help, but able to walk unassisted.	Moderately severe disability. Unable to attend to own bodily needs without assistance, and unable to walk unassisted.	Severe disability. Requires constant nursing care and attention, bedridden, incontinent.	Dead.
Pooled placebo 0-3h (n=465)						
14%	15%	11%	15%	20%	8%	17%
SITS MOST (n=6136)						
19%	20%	16%	15%	14%	5%	11%

The modified Rankin Scale (mRS) has been used to model the number of patients in Lancashire & Cumbria who would potentially have improved outcomes as a result of receiving thrombolysis and with clinical advice we have made the assumption that mRS of 1- 3 would be described as independent and mRS of 4 - 6 would be dependent.

Modelling of mRS of the 400 patients in Lancashire & Cumbria eligible for Thrombolysis						
1	2	3	4	5	6	7
mRS at 3 months without receiving thrombolysis						
56	60	44	60	80	32	68
mRS at 3 months receiving thrombolysis						
76	80	64	60	56	20	44
Change in numbers of patients by score						
+20	+20	+20	/	-24	-12	-24

This extrapolates to

- 24 patients alive who would have been dead
- 40 more patients a year with no symptoms or no significant disability
- 36 less patients a year who are dependent (with a mRS 4, 5 and 6).

The DH National Stroke Strategy Impact Assessment identifies a saving of £30,000 per independent stroke survivor per annum (p.24). The modelling suggests that after the introduction of 24/7 thrombolysis there will be 40 more patients per year in the Network with a mRS of 1 - 3.

**The potential annual cost saving in Lancashire and Cumbria for this group of patients is therefore $60 \times 30,000 = \text{£}1.8\text{million}$
= £18 million over ten years**

The DH National Stroke Strategy Impact Assessment also identifies the average 10 year cost of dependent stroke as £56,381. The modelling suggests that after the introduction of 24/7 thrombolysis there will be 60 less patients per year with a mRS of 4 - 6.

The potential cost saving in Lancashire and Cumbria for this group of patients is therefore $36 \times 56,381 = \text{£}2.03\text{ million over ten years.}$

Modified Rankin Score	Potential Cost Saving over 10 years (£ million)
1-3	18
4-6	2.03
Total	20.3

It should be noted that the calculations are based on 24/7 thrombolysis, half of patients are expected to present out of hours. With this modelling an out of hours service can be expected to save approximately £1million per year across Lancashire and Cumbria in health and social care.

How realistic is this modelling?

A recent British study shows the positive outcomes of introducing a thrombolysis service achieved by Southend University Hospitals Trust on all parts of the stroke pathway⁷ Of the 56 patients

thrombolysed in 2008 14 walked away with no disability whatsoever and 55% had a positive outcome as judged by the National Institutes of Health Stroke Scale.

Year	No of acute ischaemic stroke patients	Mortality rate	Average length of hospital stay	Discharged to live independently at home	Discharged to residential or nursing home
2005-6	395	27%	30 days	32.4%	15.1%
2006-7	346	23.4%	26.5 days	31.7%	14.6%
Sept 2007- March 2008	240	12.6%	17.8 days	55%	9%

Reduction in Length of Stay

As can be seen, average length of stay at Southend was reduced by 12 days. With the trim point for the stroke tariff set at 51 days there is unlikely to be a significant cost saving to be realised for commissioners even with large length of stay reductions. However any reduction in length of stay on stroke units will contribute to meeting the Vital Signs 90% stay on a stroke unit measure.

Social Care Savings

In a separate piece of work Lancashire County Council (LCC) (Appendix 1) have tried to quantify the numbers of people with stroke supported by the LCC social care service. This presented some challenges because social care records note the disabilities and challenges faced by the individual rather than the medical diagnosis. Manual checks on social care records produced an estimate of 15% of the total number of disabled people currently supported and funded by LCC where stroke contributed significantly to their disability.

Nursing and Residential Home Savings

LCC estimated that of residential and nursing care beds 15% are occupied by stroke survivors at a cost of £9.68 million annually. This proportion is supported by the 2005 NAO report DH Reducing Brain Damage.

If the figure is reduced to 9% as in Southend the cost would be £5.81 million annually, a saving of £3.84 million annually. The population of Lancashire County Council is 1.14 million, and the whole Network population is 1.93 million. This saving would not be realised immediately but LCC advise that the average turnover rate in nursing homes is in the region of six months. While local authorities do not have a standard tariff for residential and nursing care we modelled the potential Network saving using Lancashire's costs.

When using this methodology the potential saving in this group of 400 patients by providing 24 hour thrombolysis can be estimated at £6.6million per annum.

This figure does not include the people under 65 with stroke, people funding their own care, domiciliary care, sheltered housing or community equipment and adaptations.

The figures are higher than in the previous methodology and this can be explained by the use of average 10 year costs in the DH Impact assessment. The people that LCC are supporting will be the higher than average cost individuals.

Additional benefits would also be realised for the stroke patients who are not eligible for thrombolysis through improvements to the acute stroke pathway, i.e. quick admission to Stroke Unit, although this is difficult to model.

There would be further savings associated with the reduction in community support and rehabilitation, which are again difficult to model, given the current variation in provision of rehabilitation services across Lancashire and Cumbria. With the introduction of the proposed North West Stroke Register for all stroke patients it will be possible to accurately quantify these savings.

Options Appraisal

We have identified five commissioning options. These are to

1. Do nothing
2. Await incremental change by individual providers
3. Develop a hyper acute centre
4. Use Telestroke out of hours through a Network rota
5. Use Telestroke through a outsourced supplier.

Option 1

Do nothing

Continue with current service model with limited provision of thrombolysis 9-5 in Carlisle (2 consultants), Whitehaven (1 consultant) and Blackpool (2 consultants), which is compromised by annual leave and study leave requirements.

Costs
<ul style="list-style-type: none">• Cost neutral
Benefits
<ul style="list-style-type: none">• Capacity and funding streams unaffected.
Risks
<ul style="list-style-type: none">• Inequitable access between 9am & 5pm, across Lancashire & Cumbria, to expert clinical assessment, timely imaging and treatment including thrombolysis where appropriate.• Lancashire and Cumbria may become regional and national outlier for stroke outcomes• Expert clinical assessment, timely imaging and treatment inc. thrombolysis where appropriate will not be available in any area 24/7.• Quality Markers 7 & 8 of the National Stroke Strategy will not be met.• Increase in complaints and litigation as public expectation unmet• Unacceptable to clinical community• Continued pressure on health and social care services• Provision vulnerable to disruption as provided by so few people• Potential savings could not be realised

Option 2 Incremental local change

Each Trust to develop their own service model in 2 stages.

- 9am – 5pm hyper acute stroke care inc. thrombolysis
- 5pm – 9am and weekends hyper acute stroke care including thrombolysis

Costs
<ul style="list-style-type: none">• Cost of at least 15 extra consultants @150k per annum = £ 2.25 million per annum to achieve a sustainable rota
Benefits
<ul style="list-style-type: none">• Capacity and funding streams can be planned over the longer term• Service is delivered locally
Risks
<ul style="list-style-type: none">• Increased investment would be required for 3 - 4 additional Stroke Physicians for each hospital trust• It is unlikely that enough consultants could be recruited• On call rota may impact on 18 week waiting times• Quality Markers 7 & 8 of the National Stroke Strategy will not be met in a timely fashion• Inequitable access to expert clinical assessment, timely imaging and treatment including thrombolysis where appropriate between 9am & 5pm across Lancashire & Cumbria.• Lancashire and Cumbria may become regional and national outlier for stroke outcomes• Increase in complaints and litigation as public expectation unmet• Unacceptable to clinical community• May be unaffordable to local PCTs• Continued pressure on health and social care services• Potential savings could not be realised

Option 3

Develop a Hyper Acute Centre for Lancashire and Cumbria

A Specialist Stroke Centre would be developed where all individuals with suspected stroke would be taken for expert clinical assessment, timely imaging and treatment including thrombolysis where appropriate.

A Hub and Spoke solution is the preferred option for the Greater Manchester area at an estimated capital investment of approx £2.95 million⁸. Implementing this model also requires complex modelling. None of the existing stroke services in Lancashire and Cumbria could absorb 4000 patients without significant investment.

This model has been adopted in some urban centres where it is possible to designate one hospital to be a single Hyper Acute Stroke Centre.

Costs
<ul style="list-style-type: none">• MR scanner £800,000• CT Scanner £800,000• 5 stroke physicians £750,000• 5 neuro radiologists £750,000• Nursing and therapy staff (would require significant increase)• Extra ambulances at £500,000 each (2 are likely to be required for the 1000 Primary Angioplasty patients in Lancashire and Cumbria per year – assume 5 necessary for stroke)
Benefits
<ul style="list-style-type: none">• Development of a hyper acute Stroke Centre to offer expert clinical advice and treatment• Quality Markers 7 & 8 of the National Stroke Strategy will be met in a timely fashion• Equitable access to expert clinical assessment, timely imaging and treatment including thrombolysis where appropriate between 9am & 5pm across Lancashire & Cumbria would be achieved• Cost savings associated with 24/7 thrombolysis can be realised
Risks
<ul style="list-style-type: none">• No obvious 'hub' across Lancashire & Cumbria due to mixed geography and time constraints of 3 hour time window for thrombolysis.• Significant investment would be required to develop the specialist expertise required to support a hyper acute Stroke Centre• It is likely to be difficult to recruit the workforce for a hyper acute centre• One hyper acute Stroke Centre for Lancashire & Cumbria would involve transferring large numbers of patients around the Network• Long journeys to transfer patients to the Stroke Centre will have a big impact on the North West Ambulance Service• Potential for hyper acute unit to become blocked if no beds available to repatriate too• Clinical expertise and decision making skills reduced at the local hospitals• Likely to be unacceptable amongst clinicians and communities

- A new 24/7 rota would still need to be developed at a hyper acute centre as this would be a new service
- It is likely that new CT and MR scanning facilities would be required in a hyper acute centre
- Likely to be unaffordable to local PCTs

Option 4

Local 9 - 5 delivery with Telestroke Network virtual hub out of hours

This option involves the development of 9am – 5pm hyper acute stroke care including thrombolysis in each local hospital. A Telestroke centre 'hub' for Lancashire & Cumbria would be developed to provide local hospitals with expert clinical assessment/opinion and advice regarding treatment including thrombolysis 24/7 via a combination of teleradiology and remote presence consultation, essentially through image transfer and videoconferencing in the emergency setting (Appendix 2).

Use of Telestroke via a rotating hub to provide a service solution that will ensure that all patients with suspected stroke, out of normal working hours, have rapid access to the appropriate treatment and care including the provision of intravenous thrombolysis wherever the patient presents across the eight acute sites*.

Local stroke physicians would make up this rota and it is expected that a rota of around 1 in 14 will be achievable.

* Southport and Ormskirk NHS Hospitals NHS Trust (clinicians and managers) have also expressed an interest in joining a Lancashire and Cumbria Telestroke rota.

Costs
Capital investment in IT infrastructure required of £285,200. Recurrent investment of £115,292 (for breakdown see Appendix 3).
Recurrent Consultant costs of £168,000. This consists of 1 Programmed Activity per consultant on the rota (assuming 14 on rota). It is proposed that this cost is carried by providers within tariff through renegotiation of job plans (each provider will gain more than they spend).
Benefits
<ul style="list-style-type: none">• Quality Markers 7 & 8 of the National Stroke Strategy will be met in a timely fashion• Equitable access to expert clinical assessment, timely imaging and treatment including thrombolysis where appropriate between 9am & 5pm across Lancashire & Cumbria would be achieved• Patients will be able to be treated in their local hospital• All organisations benefit equally as they will be able to access specialist stroke expertise• Collaboration will harness the skills contained within Lancashire and Cumbria.• A Network-wide rota of stroke physicians potentially would offer a sustainable rota of around 1 in 14.• Easy conceptual model for all stakeholders to support• No impact on NWAS• Technical infrastructure already exists throughout L&C reducing need for capital investment and avoids need for significant increase in consultant workforce• Economies of scale procurement of IT hardware.• Governance infrastructure for image transfer already exists across all Network organisations.• Potential to accelerate thrombolysis expertise across the Network sites with fewer patients by using Telestroke as an educational resource• Telestroke offers the potential for a rich data source for both research and effective MDT across the Network• Acute stroke units can be supported by the Network to develop appropriate skills and training which will also improve outcomes in patients with acute stroke who are ineligible for thrombolysis

- Solution offers flexibility for additional in hours cross cover and cross site working at no extra cost
- Flexible for future developments such as out of hours high risk TIA assessment and planning discharge with community rehabilitation teams
- Opportunity for Network organisations to learn from use of Telemedicine

Risks

- Implementation has an impact on radiology and radiography workforce with potential knock on to 18 Week pathways that require imaging diagnostics
- CT skills within Radiography workforce may be insufficient to provide access to timely imaging
- Governance arrangements may not support clinical decision making across different organisations
- Patient flows in most sites do not currently achieve direct access to Acute Stroke Units
- Not all Stroke clinicians have recognised competence in thrombolysis delivery
- There is no accreditation programme for independent CT image interpretation by stroke physicians
- The nursing workforce is insufficient in numbers and skills to deliver service across all sites
- Consultant on call rotas cannot be achieved due to complexity of job planning across different organisations
- Without the support and cooperation from all acute providers the system will not be able to be implemented and maintained
- 9-5 cover is not maintained within individual sites

Option 5

Local 9 – 5 delivery with Telestroke virtual hub out of hours via an external supplier

Commissioning of an alternate supplier. None of these currently exist in the UK, however there are established Telestroke centres in the US who could potentially provide the remote consultation. Massachusetts General Hospital acts as a hub hospital for 27 different American hospitals and has provided a five year proposal for consideration ¹⁰. They advise a consultation rate to thrombolysis rate is 3:1.

Costs
<p>\$700,000 (£430,000)* Year1 \$600,000 (£368,640) Years 2-5 Plus extra \$1500 (£922) per video consultation over the 400 in contract.</p> <p>Plus capital investment cost of hardware of £285,200 Recurrent cost of communication manager of £42,428</p> <p>* conversion rate as of 22.09.09</p>
Benefits
<ul style="list-style-type: none">• Quality Markers 7 & 8 of the National Stroke Strategy will be met in a timely fashion• Equitable access to expert clinical assessment, timely imaging and treatment including thrombolysis where appropriate between 9am & 5pm across Lancashire & Cumbria would be achieved• Patients will be able to be treated in their local hospital• All organisations benefit equally as they will be able to access specialist stroke expertise• No impact on NWAS• Technical infrastructure already exists throughout L&C reducing need for capital investment and avoids need for significant increase in consultant workforce• Economies of scale procurement of IT hardware.• Governance infrastructure for image transfer already exists across all Network organisations.• Telestroke offers the potential for a rich data source for both research and effective MDT across the Network• Acute stroke units can be supported by the Network to develop appropriate skills and training which will also improve outcomes in patients with acute stroke who are ineligible for thrombolysis• Opportunity for Network organisations to learn from use of Telemedicine• Potential to accelerate thrombolysis expertise across network sites with fewer patients
Risks
<ul style="list-style-type: none">• Without the support and cooperation from all acute providers the system will not be able to be implemented and maintained. This is likely to be more difficult to achieve as there will be no local champion for the service• Implementation has an impact on radiology and radiography workforce with potential knock on to 18 Week pathways that require imaging diagnostics• CT skills within Radiography workforce may be insufficient to provide access to timely imaging• Governance arrangements may not support clinical decision making across different

organisations in different countries

- Information Governance law makes patient detail transfer outside of EU more difficult
- Patient flows in most sites do not currently achieve direct access to Acute Stroke Units
- The nursing workforce is insufficient in numbers and skills to deliver service across all sites
- Using an international supplier would expose commissioners to Foreign Exchange financial risk
- 9-5 cover is not maintained within individual sites

Summary of costs associated with each identified option

Option	Total costs	Potential to realise savings
1	Nil	NO
2	>£2.25 million (consultants only included)	YES
3	>£8.1 million excluding nursing and therapy costs	YES
4	Capital investment in IT infrastructure required of £285,200 Recurrent investment of £115,292 Consultant costs within tariff	YES
5	£430,000 Year 1 £368,640 Years 2-5 Plus extra £922 per video consultation over the 400 (up to £737600 if 1200 consultations in total)	YES

Option Recommendation

An out of hours Telestroke solution, provided by the development of a Network rota of stroke physicians is adopted as the method for delivering 24/7 thrombolysis in Lancashire and Cumbria as the most equitable and cost effective option. This should be supported by the development of a robust communication strategy for raising awareness of stroke amongst the public and care professionals across the Network.

A table that shows the share of the costs by PCT for a Network Telestroke solution.

Registered PCT	Average Stroke Spells 2007/09	Percentage of Network Admissions	Share of capital investment (£)	Share of annual revenue cost (£)
Blackburn with Darwen	345	9%	£24,537	£9,919
Blackpool	319	8%	£22,688	£9,172
Central Lancs	699	17%	£49,714	£20,097
Cumbria	1148	29%	£81,648	£33,006
East Lancs	769	19%	£54,693	£22,110
North Lancs	730	18%	£51,920	£20,988
Total	4,010	100%	£285,200	£115,292

Main Work Streams of Telestroke Implementation

These are likely to be

- Development of a formal business case with commissioners
- Procurement and implementation of IT infrastructure with SHA support
- Implementation of communication plan to raise awareness of stroke across Lancashire and Cumbria
- Negotiating Consultant job plans
- Establishing Telestroke pathway in each site through a local implementation group
- Develop robust governance for cross organisational working
- Developing Telestroke operational policy
- Training of staff

Timescale

Realistically this is likely to take 12 months. The project has been selected as a National Technology Adoption Centre national project which is likely to strengthen the project's ability to deliver.

Measuring Effectiveness

The simplest metric is likely to be the number of patients thrombolysed each year in Lancashire and Cumbria.. However the concurrent development of the North West Stroke Register and national audit programme of the first 72 hours of stroke care SINAP will allow a robust method of evaluation, particularly in terms of functional outcomes and care provided. For example it will be possible to measure Call Door, Door to CT scan and Call to Needle times by provider.

Should in the future the clinical evidence base change away from thrombolysis as has happened with heart attack care Telestroke is an easy system to decommission.

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Appendix 1

Comment from Lancashire County Council on the potential provision of 24/7 Thrombolysis across Cumbria and Lancashire as part of an improved stroke service.

Introduction

We have been in discussion with Cardiac and Stroke Networks in Lancashire and Cumbria over the summer about the proposed 24/7 Thrombolysis initiative in Lancashire and Cumbria. This contribution represents a brief analysis of numbers and finances and represents the view of Lancashire County Council.

Background

According to the NAO 110,000 people each years suffer from a moderate to severe stroke, leading to there being at any one time 300,000 living with the aftermath of stroke, trying to live their lives and get back on track as best they can¹. For the Lancashire County Council area (pop 1.14m) this implies that 2200 people a year suffer stroke and 6000 people are living with the consequences. The initiative offers:

1. real hope of swifter recovery for a proportion of those suffering stroke,
2. real and broadly quantifiable savings in expenditure for the social care funded by the County Council and for people funding their own social care as a result of stroke,
3. the opportunity to develop more integrated response to stroke rehab than has been the tradition across Lancashire.

This note indicates strong support for the TAU initiative and is set out below.

Numbers and Money

Estimating the numbers of people with stroke supported by the LCC social care service presents some challenges. This is because social care records note the disabilities and challenges faced by the individual rather than the medical diagnosis. So there is no system which can be interrogated and produce automatically a figure for the numbers of people LCC supports with stroke. However we have been able to make an estimate of the percentage of the total number of disabled people currently supported and funded by LCC where stroke contributed significantly to their disability. We have reached the estimate of 15% through the two analyses below.

1. *A manual check on the 600 people receiving a service in LCC Social Care Resource Centres.* There are 600 hundred people currently receiving services via Resource Centres – who may well be receiving other services. Of these in June 112 people were receiving services because of stroke, stroke being primary reason for people needing the support of resource centre staff. That equates to 18.6% of the total numbers receiving that service.
2. *A manual check in the last 144 people admitted to residential care, funded by LCC in the financial year 08/09.* Of the 144 records analysed 24 people had suffered a

¹ http://www.nao.org.uk/publications/work_in_progress/stroke_care_a_progress_report.aspx

significant stroke which contributed overwhelmingly to the disability which led to their needing residential care. That is 17% of the numbers of people admitted.

The sort of numbers of people funded by LCC receiving the following services are:

Residential and nursing care. The numbers of older people funded by LCC in these beds as at 31 March 2009 was as follows:

Residential care	3570
Nursing Care	908

Domiciliary care. As at July 31st 2009 there were 7824 people receiving home care funded by LCC.

These figures above are extrapolations only and have to be treated with caution so we have been extremely conservative in subsequent calculations. Using the fee rates on the Lancashire County Council web site² it is possible to identify a cost for the numbers of people outlined above. The extrapolated cost of the 15% with stroke funded in residential care by LCC is £9.68m annually and for those receiving a domiciliary care service the figure is £6.4m annually.

The cost therefore of LCC funding those people whose disability is associated with stroke in residential care or domiciliary care can be estimated at £16.15m annually. The average turnover rate for people funded by LCC in Nursing Homes is in the region of 6 months and for residential care it is usually around two years. Turnover of older people funded to receive domiciliary care is longer but less than four years.

These calculations relate only to people over 65. These calculations do not include services paid for directly by people funding their own care³. These calculations do not include the costs of the thousands of people using community equipment or being funded for home adaptations or the people receiving support from resource centres, or people receiving support via voluntary organisations (many of which are again funded by LCC), or the 13,000 older people receiving support through the Supporting People programme in sheltered housing – a similar percentage of whom will have suffered stroke. These calculations do not include the savings potential from not having to staff certain services as fully. Neither do the calculations include potential savings for the DWP, loss of taxation by HM Revenue and Customs from people receiving services nor their carers or other costs associated with longer term care. So the true likely savings are likely to be considerably more than is estimated here.

Conclusion

The calculation indicating that if the 24/7 Thrombolysis service were set up across Lancashire a saving in social care costs to LCC would be around £400,000 in the first year

² (<http://www.lancashire.gov.uk/social-services/contracts/notices/index.asp?id=2009/03/03/50224&news=575&page=pr&>)

³ There are significant numbers of people who fund their own care in Lancashire, both in residential care and domiciliary care. It is almost impossible to get at the figures for people privately buying domiciliary care as the companies concerned do not report this and commercial sensitivities dictate that even if they did the figures might be unreliable. However it is possible to make a close estimate of the numbers of people funding their own residential care. We know that as at 31st March 2009 there were 760 vacancies in such homes, so we can assume that as well as the LCC funded people there were at this time 2778 people in residential homes funding themselves. A conservative cost for this would be £6.5m, around a £1m funding people with stroke).

of operation is conservative. A more detailed and accurate analysis can be done if required but the anticipated savings as well as the anticipated improved outcomes for those Thrombolysed are in themselves strong reasons for the County Council to support the initiative and contribute to its development.

This potential saving however is only part of the reason for supporting this initiative. NHS and LCC and other partners have a mediocre track record for the effectiveness of the various stroke services in Lancashire, compared with other areas in the North West. And the quality of the various stroke services across the geographical county is very variable. For instance there seems to be little specific attention paid to stroke rehabilitation in North Lancashire, and Chorley's stroke service, according to the Sentinel Stroke Audit results for 2008 appears to be about as bad as it gets in the North West⁴. Blackburn on the other hand seems to have a focussed, effective and improving service. This lottery for people suffering from strokes across Lancashire is unacceptable and does not accord with our ambition to contribute significantly to integrated and effective services which improve outcomes for the people of Lancashire. In our view the Thrombolysis initiative should be used as a catalyst for focussed improvement across the board and presents us with strong practice and financial platform on which to move towards excellence.

– Head of Commissioning, Central Lancashire, Adult and Community Services, LCC

– Head of Intelligence, Adult and Community Services, LCC

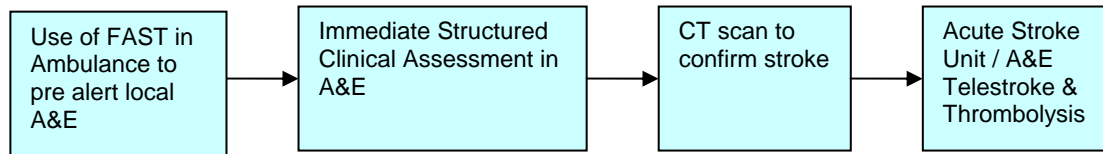
September 1st 2009

⁴ <http://www.rcplondon.ac.uk/clinical-standards/ceeu/Current-work/Documents/Public%20organisational%20report2008.pdf>

Appendix 2: Telestroke

Telestroke Service Specification

In practice a Telestroke patient pathway would look like this.



The concept involves a combination of teleradiology and remote presence consultation, essentially through image transfer and videoconferencing in the emergency setting.

The stroke physician (usually home based out of hours), using a combination of remote telepresence and image transfer via PACS and broadband technology would receive images through a remote access laptop. They would be able to see both CT scans and carry out a live consultation with the patient and local medical teams using specialised mobile telecards provided for each Acute Stroke Unit. Importantly the IT infrastructure means that audit, research and MDT will be built into the Telestroke solution.

Technical Data

A full technical specification has now been developed in conjunction with _____, Programme Lead for ICT Infrastructure, Chief Programme, Chief Information & Knowledge Office, North West Strategic Health Authority and is detailed in an Outline Business Specification.

Appendix 3

Costing for Telestroke

Item List	Quantity	Unit Cost £	Capital Cost Sub Total £	Quantity	Service Unit Cost pa £	Recurrent Cost per annum Total £
Telecart	8	9,700	77,600			
Maintenance	8				1,240	9,920
Firewall Traversal Device	6	5,600	33,600			
Firewall Traversal Device Maintenance PA	6				700	4,200
Laptop with VC Software	16	2,400	38,400			
HD Desktop Unit		4,800	76,800			
HD Desktop Maintenance				16	725	11,600
N3 RAS	16	300	4,800	16	160	2,560
N3 IP Stream	16	1,500	24,000	16	840	13,400
Video bridge	24				1,000	24,000
Storage & Telecarts Training						Included in above
Set Up Costs			30,000			
Band 5 Administration Support for Network Consultant Rota						28,784
Band 7 Communications Manager						42,428
Total			285,200			115,292