Bidding for and setting up a Comprehensive Stroke Unit

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**Abstract**

Northwick Park is a district teaching hospital in NW London. In Jul 2009, Healthcare for London agreed to commission hyperacute stroke care in only eight units. These had to provide guaranteed minimum staffing levels, daily ward rounds including weekends and public holidays, and thrombolysis (clot-busting) treatment) 24/7. We were the only unit to bid that was not already a major neurology centre. Our successful bid had to be implemented to a very tight timetable and has now been operating for three years. Our results are audited nationally and demonstrate the success of the project. Before the project the Unit had 20 beds, one consultant and only three whole time equivalent therapists. We had thrombolysed 12 patients in two years. Patients did not go straight to the Stroke Unit from A&E. Although our rehabilitation processes were good we were limited by patients having to wait to get onto the Unit and by staff numbers. Now, there are 50 beds and over 130 staff. Performance is intensively monitored by the Stroke Network. Every patient is entered into the Royal College of Physicians continuous audit, and assessed against national standards. Our reputation is national and we have hosted teams from many units in the UK and abroad to demonstrate our processes and pathways. We conclude that with good planning, robust care pathways and a strong local management team backed by financial and Board level support, it is possible to implement a widespread change in treatment of a common and disabling condition.

**Problem**

Stroke care in London was, until recently, provided by almost all acute hospitals. However, the National Sentinel Audit run by the Royal College of Physicians, had shown that care was very patchy and in many centres the quality of care, as measured by the audit, had deteriorated between 2006 and 2008 (1,2) Thrombolysis, an emerging treatment for acute stroke (3) had a very poor uptake and was only offered in a few hospitals. The commissioners, Healthcare for London (HfL), felt that only a total reorganisation of stroke care in the capital would result in the sea change in treatment that was needed. (4)

Following expert advice, HfL decided that hyperacute stroke care should only be available in a limited number of centres who had to agree to provide treatment 24/7. They also set minimum staffing and operational standards for any hospital that wished to have a stroke unit. At Northwick Park we were geographically well-placed for such a unit as there were no other local hospitals with the enthusiasm to provide a comprehensive service. However, at the time of bidding to provide this service, our CT service was 9-5 Mon-Fri only, we only had a single doctor trained to give thrombolysis and our staffing levels were neither able to support seven day working, 24/7 thrombolysis or the nurse and therapist levels demanded by HfL.

**Background**

Evidence from a number of clinical trials has shown that every patient with suspected stroke should be managed on a specially designated Stroke Unit. (5) This should be run by a consultant trained in stroke with a dedicated multidisciplinary team which should provide rapid assessment and diagnosis, management of risk factors, and specialist rehabilitation.

Thrombolysis, a clot-busting treatment, suitable for ischaemic stroke, was identified as being beneficial for selected patients in a number of trials but requires a dedicated team to administer it, as it is a high risk treatment which requires specialist skills to give safely. Uptake of this treatment was very poor in the UK as a whole and in London in particular, reaching only about 3% of stroke patients.

Transient ischaemic attack (TIA) has been shown to be a warning for stroke and requires urgent assessment and management of risk factors after appropriate diagnostic tests. The evidence shows that patients are at highest risk of stroke in the hours or days after a TIA so urgent specialist assessment is imperative. Few hospitals in the UK were assessing patients even in the first week after their attack. (6)

**Baseline measurement**

The National Sentinel Audit of Stroke assessed hospitals in the UK in 2006 and 2008. While scoring well on measures of rehabilitation, Northwick Park was not thrombolysing any significant number of patients and our TIA clinic ran only once a week. Due to bed pressures in the Hospital we were not able to admit patients directly to the Stroke Unit and only 55% of patients spent 90% of their stay there. Most of them were first admitted to an admissions ward and only transferred to the Stroke Unit after a few days. Only 70% of patients were scanned within 24 hours. (7)

**Design**
This is a longitudinal study concerning the process of establishing a Comprehensive Stroke Unit under Healthcare for London's criteria. Before and after results are based on national audit.

The design of the service falls into two main categories:
1. Staff recruitment and training
2. Development of the model and pathway of care

**Strategy**

1. Staff recruitment and training

We bid to provide the service in November 2008 and the final contract was only agreed July 2009. We had to meet required standards and open by February 2010.

To satisfy the staffing requirements we had to appoint 75 new nurses and 20 therapists of various grades. We had to appoint two new consultants to enable them to do daily ward rounds including weekends and bank holidays. We had to organise a rota of nine consultants trained to thrombolyse with a door-to-needle (DTN) time within 60 minutes. We used the three stroke consultants, three A&E consultants who agreed to do this work and three geriatricians who had some stroke training who would help cover weekends. They could not be used during the week because of full time commitments elsewhere. A stroke consultant from an adjacent hospital was also keen to maintain her skills and was contracted to provide thrombolysis for 1 in 6 weekends.

2. Development of the model and pathway of care

We adopted a model used elsewhere on a smaller scale where the main thrombolysis expertise would be provided by appropriately trained Band 6 nurses who would become specialist stroke nurses and provide this cover 24/7. 19 nurses were needed for this rota. Their role would be to help the junior doctors in A&E diagnose strokes, implement the thrombolysis pathway, pull the patient through the system and liaise with the consultant decision maker either in person or over the phone. They would also liaise with other hospitals without a HyperAcute Stroke Unit (HASU) to transfer appropriate patients to us at all times of the day or night.

We developed the CT service to enable urgent scanning 24/7 with reports to support the 45 minute DTN time and upgrade a 34 bed ward to a state-of-the-art facility. This required clinical input to a full design and build service.

The culture change meant that stroke had to be treated as blue-light emergency by the ambulance service, Band 6 nurses, A&E, bed managers, radiology and the ward. We achieved this by regular operational meetings, regular senior staff meetings, a patient focus group, monthly sharing of audit data against standards between managers and frontline staff, involving staff in problem solving, a solution-focused, not hierarchical approach, an open door policy for senior staff, sharing evidence with all groups, and intensive training with scenarios. Protocols were written to ensure that every suspected stroke patient was taken to the HASU within four hours and that no stroke patients ended up on other wards.

In order to ensure the system was fully sustainable we undertook detailed disaster planning to work 365 days a year. In the first three years we have dealt successfully with scanner breakdown & planned replacement, multiple patients arriving simultaneously, a Norovirus outbreak, snow-induced transport problems and power cuts.

A seven day clinic was set up to investigate high risk TIAs within 24 hours. To ensure there was no waiting for carotid scans we had to exert tight control over ultrasound with the agreement of the technicians, vascular surgery and neurology. Routine seven day working for doctors, nurses and CT was part of the operational policy.

Historically, thrombolysis, a high risk treatment, has been given only by stroke specialists. In order to implement this in a general hospital we developed tight protocols and intensive training enabling non-stroke specialists to treat all eligible patients safely. This involved discussing every thrombolysed patient at a monthly multidisciplinary meeting.

Intensive training developed highly motivated specialist band 6 nurses able to work to high standards at high speed. Close working with and training for local ambulance services helped bring people into hospital faster. A research project has been approved for trial of ambulance staff taking patients direct to CT.

Data were gathered in real time and uploaded to the Stroke National Audit Project (SINAP) and were monitored by the North West London Cardiac & Stroke Network. They were fed back to the team quarterly and particular issues addressed.

To improve our DTN time, a spreadsheet was developed to break down the time into its various components so that action could be taken to reduce times by specific interventions. This programme and its effects has been published. (8)

**Results**

We declared ‘no beds’ available for only eight half-days in the year 2011/12, fewer than any other London unit. (9) From February 2010, our thrombolysis rate rose to be the highest in England. We are thrombolysing 92% of eligible patients and 29% of all strokes, compared with 68% and 11% nationally. (10) Our median door-to-needle time has now been the fastest in England for the most recent nine months consecutively, at 30 minutes compared with 85 minutes nationally. (10)

We were awarded ‘Clinical Research Site of the Year 2012’ by the National Institute of Health Research’s Stroke Clinical Research Networks for our research effort. (10) We have had six posters accepted and an oral presentation at each of the last two UK Stroke Forum research conferences, despite not having any formal academic time or funding.

100% of high-risk were TIA’s investigated within 24 hours. A redesigned pathway has led to our time between referral and carotid surgery to be fourth fastest out of 128 Trusts in the UK. (12)
Our median length of stay (LOS) is 2.5 days in the hyperacute stroke unit (HASU) plus 14 days in the Stroke Unit, despite the PCTs not funding early supported discharge teams. This is the shortest LOS in London and one of the shortest in England.

Continuous patient surveys show mean satisfaction rating of 74% on a five-point scale indicating ‘good’ to ‘excellent’.

From the outset we incorporated clinical psychology into our service. We developed a new acute cognitive screen which has been adopted by several other units in the UK and is now formally adopted as standard in the region. A peer-reviewed journal publication is currently in press. We have attracted research funding for clinical psychology studies.

Community Stroke co-ordinators have been appointed jointly by health and social services locally. We have developed a standardised follow up which crosses organisational boundaries and ensures that problems after discharge are referred to the appropriate person automatically. This has also been presented and published nationally.

We invested in two data officers who ensure our data is accurate and entered in real time. The Unit has been managed within budget (with a small profit) since inception.

Lessons and limitations

Breaking down barriers is critical to success. We showed this in a number of areas:

- Doctors and nurses were persuaded not to wait for porters to move patients to CT, reducing delay.
- All staff were trained to assess swallowing and whether patients could get out of bed safely, preventing the complications of aspiration or poor nutrition and encouraging early mobility.
- Admitting patients with carotid stenosis needing surgery to the Stroke Unit rather than to a surgical bed reduced the chance of their operation being cancelled.
- Close relationships and intensive training of stroke coordinators prevented the anticipated problems when repatriating patients to their local hospital.
- Researchers embedded into clinical teams led to award-winning recruitment into randomised trials.

Calculated risk taking gave worthwhile benefits:

- A&E consultants had never been involved with stroke thrombolysis before. Intensive training and regular audit made them safe and consistent.
- A special area in radiology for thrombolysis was used to shorten DTN time. This was negotiated after we realised that wheeling patients back to A&E added 10 minutes and that we could use an area that was used to dealing with patients who needed monitoring.
- Estimating patients’ weight also shortened DTN time. We have published data showing this to be safe.

Training was key to success. In the early days of the project we had meetings with our Band 6 nurses every six weeks for problem solving and going over individual issues. The protocols and pathways needed repeated modification to cover every eventuality. Some Band 6 nurses proved not to be suitable to this role while others have now fully embraced it and are mentoring a new generation of specialists.

Management buy-in is critical. Our Trust management bought fully into the stroke project. They agreed a clear policy that stroke beds were to be protected to enable us to get 100% of patients to the HASU within 4 hours. They invested heavily in the staffing of the service and were rewarded with first class outcomes and a reduction in length of stay. They invested in 24 hour CT which later turned out to be a crucial step in attracting other high profile units to the Trust. The year after this project, a major vascular surgery unit was sited at the Trust which has cemented its place as the major acute hospital for the area. Our national excellence and awards has raised the profile of the Trust generally and we are much more successful in attracting high quality staff.

Conclusion

Quantifiable and measurable improvement in patient care have been demonstrated from the time the project was implemented.

Before the project the Unit had 20 beds, one consultant and only three whole time equivalent therapists. We had thrombolysed 12 patients in two years. Patients did not go straight to the Stroke Unit from A&E. Although our rehabilitation processes were good we were limited by patients having to wait to get onto the Unit and by staff numbers.

Now, we have 54 beds and over 120 staff. Our performance is intensively monitored by the Stroke Network. Every patient is entered into the Royal College of Physicians continuous audit, assessed against national standards. Our reputation is national and we have hosted teams from many units in the UK and abroad to demonstrate our processes and pathways.

We conclude that with good planning, robust care pathways and a strong local management team backed by financial and Board level support, it is possible to implement a sea change in treatment of a common and disabling condition.

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No interests declared

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