

## **COLLABORATION FOR LEADERSHIP IN APPLIED HEALTH RESEARCH AND CARE SOUTH WEST PENINSULA (PENCLAHRC)**

### **Case Studies Showcasing the Value of CLAHRC Funding 1 January 2014 to 31 March 2015**

#### **4. Stroke Pathways - Achieving a step-change in the emergency stroke pathway across the South West Peninsula**

Following a stroke caused by a blood clot within the brain, thrombolysis has the potential to increase the odds of having no significant disability by around 40%. NICE guidance supports the use of alteplase for thrombolysis up to 4.5 hours after stroke but emphasises that treatment should be given as soon as possible to maximise the ratio of benefits to potential harms. Recovery with minimal disability after stroke means a better quality of life for survivors, reduced burden on carers, maximised contribution to economic activity, and reduced long-term costs for health and social services.

In 2011 we carried out a pilot simulation modelling project with the Royal Devon and Exeter Foundation NHS Trust. This brought together a team of computer modellers from PenCLAHRC's operational research group (PenCHORD) with clinicians and managers from the NHS Trust to explore different approaches to reducing the door-to-needle time for people with suspected stroke. Using data from a national survey of stroke management and, crucially, rich local data from the Trust, a model of the pathway from arrival at hospital to treatment was constructed to explore the potential impact of a wide range of "what if" scenarios.

A key change identified in the project was that it was beneficial if ambulance staff alerted the hospital of the carriage of a person with suspected stroke so that the relevant resources (e.g. stroke specialist nurses and radiologists) could be prepared for their arrival and manage their care with minimal delays. The model allowed consideration of putative problems with changes, e.g. increased pressure on radiology services, and the establishment of the project team allowed full and detailed consideration and acceptance of the evidence supporting the use of thrombolysis.

This initial project resulted in significant changes to the trust's performance in managing acute stroke. Within a year of the project the proportion of people with stroke who received thrombolysis climbed to 14%, close to the levels seen in the most specialised urban hyper-acute stroke units.

Several publications have arisen from this early work, emphasising the importance of minimising delays in the treatment pathway (e.g. Monks et al. (2012). *Stroke*. 2012. 43(10):2706-11). Perhaps more importantly, the project established the value of simulation modelling to explore the

potential for change and the importance of being able to use routinely collected data to inform modelling and monitor the effects of change.

Although the impact in one hospital has been considerable, there are around 4000 strokes each year in the South West region and the National Stroke Strategy (2007) set a ten-year target that a minimum of 10% of people suffering these events should receive thrombolysis. There is considerable variation in the South West on performance against this target and some centres report thrombolysis rates as low as 6%.

Building on the work at the Royal Devon and Exeter Hospital, and with the support of the South West AHSN and Strategic Clinical Network, PenCLAHRC has extended its work on acute pathway modelling to all hospitals in the region. In each case, the reduction in time to treatment may come from different changes – it is part of the “art” of collaborative working to explore and identify changes which can be realised and made routine practice. Simulation modelling is a powerful tool that supports collaboration in these circumstances but needs to be informed by good routine data. In the case of stroke, this data is available and we are making good progress in working across our local health economy’s trusts.

Recognising the importance of a team approach to identifying and realising change, our collaborative project with the AHSN and SCN has funded the appointment of a Stroke Quality Improvement Manager to work with acute trust staff so that the project can be managed effectively and changes realised quickly. This has ensured access to the right people and the right data in each trust, although an important feature of the post is that it sits outside the trust. We have identified different issues in each trust, partly related to differences in staffing profiles used to support thrombolysis at different times of day. A simulation model of the pathway within any given trust is used to consider the impact of changing staffing arrangements on rates of thrombolysis and proportion of people leaving hospital with minimal disability.

Although the development and application of simulation models is a critical part of this project, we have learned that the complex interplay between the stakeholders within a trust and with players outside the trusts (e.g. ambulance staff) can be critical for the realisation of change. Our partners in the AHSN have recently funded an additional study to be carried out alongside the stroke pathway modelling project. This will use ethnographic methods to explore the processes of change (effective or otherwise) in trusts with the aim of identifying generic lessons that will aid quality improvement outside any given trust, perhaps through the development of a set of tools to support the use of simulation modelling as a catalyst for change.

## **CONTRIBUTION OF NIHR CLAHRC**

PenCLAHRC provided the expertise necessary to construct simulation models of the acute stroke pathways in the initial site and subsequently in all the trusts across the region. This has yielded a generic pathway model that is being refined in the course of its application in each trust. PenCLAHRC is also providing overall leadership to the project in close collaboration with the Strategic Clinical Network and AHSN.

PenCLAHRC researchers with specialist skills in ethnography and implementation science are involved in the project to explore the implementation of change described above. We intend that this work will inform a bid to the NIHR HS&DR programme in 2015/16 for an extension to the work

we are carrying out here into other fields of modelling; this will allow us to investigate the use of these techniques to support identification and implementation of improvements in service configuration and activity.

The project will end in late 2015, by which time we will have modelled acute stroke in seven acute NHS Trusts. As of May 2015 we are closely involved in modelling the activity in South Devon Healthcare NHS Trust and Plymouth Hospitals NHS Trust.

## **WHAT HAPPENED NEXT?**

We continue to receive strong support for the project from all partners. We have particularly good support from Plymouth Hospitals NHS Trust, which has amongst the longest door-to-needle times in the country. We are making good progress on developing a model there and, crucially, in drawing together the appropriate clinical specialists and managers to make the model meaningful as a basis to explore and implement change.

The use of modelling to inform change is also helping ratify local and national data on stroke service performance. A national stroke dataset (SSNAP) exists but there is variation in the way that trusts report and use this data. The PenCLAHRC acute stroke pathway modelling project, as a consumer of this data, is highlighting issues with the data that will enable clarification and improvement in data definitions and flow.

The modelling work within acute hospitals has also attracted further work from the Strategic Clinical Network to examine configuration of acute thrombolysis projects across the entire geography of the South West, including the parts of the region outside the SW Peninsula. This project is part of a broader urgent care review, including thrombolysis and acute cardiac care (primary percutaneous cardiac intervention – PCI). This work will also complete in 2015.