All Wales Stroke Services Improvement Collaborative (AWSSIC)

End of Year Report 2008/09
With thanks to:

Jan Sharp, Media Resources Centre, University Hospital of Wales, Heath Park, Cardiff, for her permission to use the ‘Cariad Cerebrum’ image of the head on our cover.

Executive Summary

By 2006 the standard of stroke services in Wales had begun to lag significantly behind those in the rest of the UK. It was recognised by the Welsh Assembly Government in the Welsh Health Circulars 058 and 082 published in 2007 that this trend had to be reversed.

The All Wales Stroke Services Improvement Collaborative (AWSSIC) was launched in September 2008. It used a collaborative programme methodology to bring together teams of clinicians and managers from acute hospitals across Wales to improve the reliability of the care of stroke patients in the acute stage (first seven days). In just one year the Collaborative has enabled frontline staff from all Welsh healthcare organisations to improve their services in line with Royal College of Physicians guidelines and demonstrate significant improvements in the delivery of stroke care.

The acute stroke care pathway was distilled into a Driver Diagram which set out which evidence-based interventions AWSSIC would focus on. These interventions, or processes of care, were grouped into four Care Bundles, based on the time frames in which the interventions should be delivered - first three hours, first 24 hours, first three days or first seven days.

The Collaborative has provided a positive environment to support teams to develop services resulting in improved patient experiences and better processes of care. Teams have monitored their compliance with the four Care Bundles by collecting data on a prospective basis for all new stroke patients admitted. Frontline clinicians have been empowered to test and introduce changes that have led to measurable service improvements.

As well as local improvements in services, collated self-reported data from 10 of the sites involved has shown significant changes on an All-Wales basis for:

- The time taken from a stroke patient arriving at A&E to them being admitted to a specialist stroke bed has reduced from an average of over 100 hours to an average of 43 hours
- The percentage of patients who have their swallow screened within 24 hours of them having their stroke has gone from an average of 38% to an average of 56%
- The percentage of patients who are mobilised within 3 days of having a stroke has improved from an average of 35% to an average of 56%.

The teams continue to collect data and make changes to their acute stroke services which improve the reliability of the care they deliver. The clinicians and managers in Wales have shown great enthusiasm, motivation and effectiveness in improving stroke services in Wales and have valued the support, skills and tools that the AWSSIC provided them with.

The lessons learnt, the experience gained and the improvements captured by AWSSIC have created a momentum which will continue into the second year of the Collaborative as it extends to address early rehabilitation following stroke and prevention of stroke through timely management of Transient Ischaemic Attacks.

In addition AWSSIC has helped to inform the development of Intelligent Targets for stroke which will be incorporated into the Annual Operating Framework for next year as a strategic driver for continuous improvement of stroke services.
## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduction</strong></td>
<td>5</td>
</tr>
<tr>
<td><strong>Where We Were</strong></td>
<td>6</td>
</tr>
<tr>
<td>- Royal College of Physicians Sentinel Stroke Audit</td>
<td>6</td>
</tr>
<tr>
<td>- Welsh Health Circulars</td>
<td>7</td>
</tr>
<tr>
<td>- Stroke Services Improvement Programme</td>
<td>7</td>
</tr>
<tr>
<td><strong>What We Did</strong></td>
<td>8</td>
</tr>
<tr>
<td>- Collaborative</td>
<td>8</td>
</tr>
<tr>
<td>- Model for Improvement</td>
<td>11</td>
</tr>
<tr>
<td><strong>What Happened</strong></td>
<td>12</td>
</tr>
<tr>
<td>- Changes across Wales</td>
<td>13</td>
</tr>
<tr>
<td>- Development of Stroke Trigger Tool</td>
<td>16</td>
</tr>
<tr>
<td><strong>Looking Back</strong></td>
<td>17</td>
</tr>
<tr>
<td>- Delegate Feedback</td>
<td>17</td>
</tr>
<tr>
<td>- Project Leads’ Experiences</td>
<td>18</td>
</tr>
<tr>
<td><strong>Looking Forward</strong></td>
<td>19</td>
</tr>
<tr>
<td><strong>Conclusions</strong></td>
<td>20</td>
</tr>
<tr>
<td><strong>Appendix One - Individual Teams’ Experiences</strong></td>
<td>21</td>
</tr>
<tr>
<td>- North Wales - East</td>
<td>22</td>
</tr>
<tr>
<td>- North Wales - Central</td>
<td>27</td>
</tr>
<tr>
<td>- North West Wales</td>
<td>30</td>
</tr>
<tr>
<td>- Hywel Dda - Bronglais</td>
<td>34</td>
</tr>
<tr>
<td>- Hywel Dda - Withybush</td>
<td>36</td>
</tr>
<tr>
<td>- ABMU - West Division</td>
<td>38</td>
</tr>
<tr>
<td>- ABMU - East Division</td>
<td>41</td>
</tr>
<tr>
<td>- Cwm Taf.</td>
<td>44</td>
</tr>
<tr>
<td>- Cardiff - UHW</td>
<td>45</td>
</tr>
<tr>
<td>- Cardiff - Llandough</td>
<td>47</td>
</tr>
<tr>
<td>- Gwent - Royal Gwent Hospital</td>
<td>48</td>
</tr>
<tr>
<td>- Gwent - Nevill Hall Hospital</td>
<td>50</td>
</tr>
<tr>
<td><strong>Appendix Two: Stroke Trigger Tool</strong></td>
<td>54</td>
</tr>
<tr>
<td><strong>References</strong></td>
<td>56</td>
</tr>
</tbody>
</table>
Introduction

Stroke is defined by the World Health Organisation as ‘a clinical syndrome consisting of rapidly developing clinical signs of focal (or global in the case of coma) disturbance of cerebral function lasting more than 24 hours or leading to death with no apparent cause other than a vascular origin’.

The National Institute of Clinical Effectiveness (NICE) Clinical Guideline for Stroke (2008) states that ‘Stroke is a preventable and treatable disease. It can present with the sudden onset of a neurological disturbance including limb weakness or numbness, speech disturbance, visual loss or disturbance of balance. Over the last two decades, a growing body of evidence has overturned the traditional perception that stroke is simply a consequence of ageing which inevitably results in death or severe disability’.

These definitions describe the fact that stroke presents with diverse neurological problems and that the cause is vascular. However, they do not convey the range and complexity of services that stroke patients require, which include:

- rapid recognition of symptoms (general public, primary care, emergency services)
- acute diagnostic services (A&E, radiography, radiology and physicians)
- acute care (nursing and therapy staff)
- early multidisciplinary rehabilitation continuing into
- longer term and vocational rehab

This complexity presents a formidable challenge to those trying to improve stroke services because improvements in each one can reduce both the impact of a stroke both on the patient and the significant burden on the health and social care systems, but there is not one area in which improvements can make a significant impact on its own. Any improvements, therefore, have to start with a selection of the services involved.

Until recently it was not necessary for there to be a particular sense of urgency about the diagnosis of stroke. There were no proven therapies which made a difference if given within the first few hours. Stroke was not recognized as a medical emergency. However, early medical management has now been shown to have an impact on patient outcome. The diseases underlying the various mechanisms of vessel occlusion are also becoming better understood and this is another reason for the resurgence of interest in the field.

The aim of the first year of the All Wales Stroke Services Improvement Collaborative was to support organisations to develop services which improved the outcomes for people following a stroke by improving the reliability of the care they received in the first seven days following stroke.
Where We Were

Royal College of Physicians Stroke Sentinel Audit

The Royal College of Physicians’ Clinical Effectiveness and Evaluation Unit (CEEU) conducted the first round of the National Sentinel Stroke Audit in 1998. It has been repeated bi-annually since. The objective of the Sentinel Audit is to assess the quality of care for people who have had a stroke and to help hospital trusts use audit as a means of quality improvement. The audit is based on evidence-based standards for the organisation of services and process of care agreed by the representatives of the Colleges and professional organisations of the disciplines involved in the management of stroke.

The audit carried out in 2006, and the report published in May 2007, showed that stroke services in Wales were lagging behind those in the rest of the UK.

Table 1 below provides a comparison of compliance with the 12 key clinical indicators for England, Wales and Northern Ireland, as well as a national average.

The Report for England, Wales and Northern Ireland of the National Sentinel Stroke Audit Phase II (Clinical Audit) 2008, which took place just prior to the launch of the Collaborative, was published in May 2009, and is available for comparison at:
http://www.rcplondon.ac.uk/clinical-standards/ceeu/Current-work/stroke/Pages/Audit.aspx

<table>
<thead>
<tr>
<th>Table gives % compliance with each indicator, for applicable patients</th>
<th>National Sites 230</th>
<th>England 196</th>
<th>Wales 19</th>
<th>N. Ireland 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1.7 Treated in a stroke unit during their stay</td>
<td>62</td>
<td>64</td>
<td>28</td>
<td>12</td>
</tr>
<tr>
<td>Q1.9 More than 50% of stay on a stroke unit</td>
<td>54</td>
<td>56</td>
<td>22</td>
<td>60</td>
</tr>
<tr>
<td>Q3.1 Screened for swallowing disorders within first 24 hours of stroke</td>
<td>66</td>
<td>67</td>
<td>55</td>
<td>62</td>
</tr>
<tr>
<td>Q1.2iii Brain scan within 24 hours of stroke</td>
<td>42</td>
<td>43</td>
<td>38</td>
<td>40</td>
</tr>
<tr>
<td>Q3.3 Commenced aspirin by 48 hours after stroke</td>
<td>71</td>
<td>71</td>
<td>76</td>
<td>68</td>
</tr>
<tr>
<td>Q3.5 Physiotherapy assessment within first 72 hours of admission</td>
<td>71</td>
<td>72</td>
<td>54</td>
<td>74</td>
</tr>
<tr>
<td>Q4.2 Assessment by Occupational Therapist within 7 days of admission</td>
<td>68</td>
<td>69</td>
<td>50</td>
<td>73</td>
</tr>
<tr>
<td>Q5.1 Weighed at least once during admission</td>
<td>57</td>
<td>57</td>
<td>54</td>
<td>50</td>
</tr>
<tr>
<td>Q5.3 Mood assessed by discharge</td>
<td>55</td>
<td>54</td>
<td>53</td>
<td>77</td>
</tr>
<tr>
<td>Q6.3 On antithrombotic therapy by discharge</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Q5.5 Rehabilitation goals agreed by the multi-disciplinary team</td>
<td>76</td>
<td>76</td>
<td>70</td>
<td>88</td>
</tr>
<tr>
<td>Q7.4 Home visit performed before discharge</td>
<td>63</td>
<td>64</td>
<td>53</td>
<td>50</td>
</tr>
<tr>
<td><strong>Average for 12 indicators for 2006</strong></td>
<td><strong>65</strong></td>
<td><strong>66</strong></td>
<td><strong>54</strong></td>
<td><strong>68</strong></td>
</tr>
</tbody>
</table>

*Table 1: Comparison of compliance with of the 12 key clinical indicators between England, Wales and Northern Ireland 2006, Source RCP 2007*
Welsh Health Circulars

In August 2007 the Minister for Health published a Welsh Health Circular (WHC (07) 058). This confirmed that stroke was now a priority for the NHS and social services in Wales. It set out what action was required from commissioners and providers by March 2008. It also announced that a formal programme of work would be published and that the establishment of acute stroke units should be a priority.

This WHC instructed the Wales Centre for Health (WCfH), National Public Health Service for Wales (NPHS) and the National Leadership and Innovation Agency for Healthcare (NLIAH) to establish a formal partnership to:

- ensure the most appropriate use of resources, skills and expertise within the three organisations
- foster and develop clinical leadership within stroke services

WHC (2007) 082, published in December 2007, set out the formal programme of work for 2008-11 to guide and direct the progressive implementation of the standards for stroke care set out in the National Service Framework for Older People. There were specific actions for the partnership in the WHC, as well as for LHBs, NHS Trusts and social services.

Stroke Services Improvement Programme

This stroke partnership published a Stroke Services Improvement Programme (SSIP) in April 2008. One of the initial five workstreams of this programme was the development of the All Wales Stroke Services Improvement Collaborative (AWSSIC), involving a range of professionals from across Wales to take forward the improvement of acute stroke services. That work is the focus for this report.
What We Did

The AWSSIC was based on an evidence-based clinical change model that has been adapted to suit the needs of the healthcare system in Wales. This model has been successful in delivering demonstrable improvements in patient care in the Safer Patients Initiative (SPI), the 1000 Lives Campaign and the Welsh Critical Care Improvement Programme (WCCIP).

The three elements of this approach are:

- an evidence-based patient pathway, simplified into a Driver Diagram of interventions by Welsh professionals, to ensure a fit with the national context
- a national campaign underpinned by a breakthrough collaborative project structure to support teams in achieving changes
- the Institute of Healthcare Improvement (IHI) Model for Improvement

The Driver Diagram


The team concentrated on the four clinical areas that have been shown to have the greatest benefit on patient outcomes:

- rapid recognition of symptoms and early diagnosis of stroke
- emergency treatment for people with stroke
- specialist care for people with acute stroke - early mobilisation
- specialist care for people with acute stroke - patient-centred and goal-orientated care

These clinical areas were then developed into Care Bundles. A Care Bundle is a group of between three and five specific interventions or processes of care that have a greater effect on patient outcomes if done together in a time-limited way, rather than separately.

Implementing Care Bundles requires consistency. The elements of a Bundle are not new. They are evidenced best practice but they are often not performed uniformly, making treatment unreliable. A Bundle ties the elements together into a package of interventions that people know must be followed for every patient, every single time. The steps must all be completed to succeed; the ‘all or none’ feature is the source of the bundle’s power. It encourages multi-professional teams to work together to achieve improved compliance with a Bundle.

Care Bundles can be displayed as a Driver Diagram, clearly setting out which interventions need to be done in what time frames. This simplicity makes implementing the change more likely to be successful. The Driver Diagram used to guide AWSSIC is shown in Figure 1, below.
# All Wales Stroke Services Improvement Collaborative: End of Year Report 2008/09

## CONTENT

<table>
<thead>
<tr>
<th>DRIVERS</th>
<th>INTERVENTIONS</th>
</tr>
</thead>
</table>
| **First Hours Bundle - Rapid recognition of symptoms and diagnosis within 3 hours** | • Rapid diagnosis using a recognised tool e.g. ROSIER  
• Confirmation of diagnosis by experienced clinician  
• Stat aspirin |
| **First Day Bundle - Emergency treatment for people with stroke within 24 hours** | • CT scan  
• Admission to co-located beds (ASU)  
• Swallow screen  
• Prescription of regular aspirin (if non-haemorrhagic stroke) |
| **First 3 Days Bundle - Early mobilisation following stroke within 3 days** | • 36hrs continuous physiological monitoring  
• Manual handling assessment  
• Nutritional screening  
• Physiotherapy assessment commenced  
• Getting patients out of bed |
| **First 7 Days Bundle - Patient centred and goal-orientated specialist care following stroke within 7 days** | • OT assessment commenced  
• MDT goal setting meetings  
• Information sharing with patients/carers  
• Estimating discharge dates |
| **Reduce the number of episodes of avoidable harm** | Interventions identified by the Global Trigger Tool analysis |

*Fig 1: Driver Diagram for acute stroke care*

## The Breakthrough Series Collaborative Model

Fourteen stroke teams across Wales were invited to join AWSSIC through a formal Collaborative based on the Institute of Health Improvement’s “Breakthrough Series Model”. Invitations to attend the launch of the collaborative at the first learning session were circulated through the Chief Executives of the NHS Trusts and LHBs in Wales.

A Collaborative brings together groups of practitioners from different healthcare organisations to work in a structured way to improve one aspect of the quality of their service, see Figure 2 below.

The Collaborative creates a structure in which interested organisations can easily learn from each other and from recognised experts in topic areas where they want to make improvements.

The faculty for the collaborative included Dr Anne Freeman, Consultant Physician, and Michelle Graham, Clinical Nurse Specialist, Royal Gwent Hospital, as clinical experts; Dr Alan Willson and Chris Hancock from NLIAH as the improvement experts; Mike Davidge, Welsh Centre for Health and Nick Tyson, NLIAH, as the data experts and Michelle Price, NLIAH, as programme manager.

Learning Sessions

There were three learning sessions (LS) during the collaborative. The launch event in November 2008, then a follow up session in March 2009, and a final learning session in July 2009.

There was a change in format of the LSs as the Collaborative progressed. In LS One all the presentations were given by the faculty on the model for improvement, using data for improvement and the How to Guide. The final LS was much more interactive, with a World Café session and feedback from all of the teams involved in both plenary and small group sessions on their learning and successes. LS Two was a combination of the two formats.

Action Periods

Teams were encouraged to nominate a project lead who was the main point of contact between the team and the programme manager and faculty.

The teams were supported during the Action Periods with site visits from the programme manager, monthly telephone conferences and three national meetings of project leads. Two of the project leads meetings included skills sessions on statistical process control and presentation skills.

An intranet site was also set up as part of the overarching SSIP, hosted by the National Public Health Service (NPHS):


This helped communication within the Collaborative. All the presentations for the learning sessions were available on the site, as well as resources that the teams developed and were happy to share, such as documentation, protocols, guidance and teaching resources.
Model for Improvement

The Institute of Healthcare Improvement’s (IHI) Model for Improvement\(^1\) is a simple tool for accelerating improvement (see Figure 3). It has been used very successfully by hundreds of health care organizations in many countries to improve many different health care processes and outcomes.

At the first learning session, teams were introduced to this model and encouraged to use it to effect local improvements in their services.

The model has two parts:

- Three fundamental questions
  - What are we trying to accomplish?
  - How will we know if a change is an improvement?
  - What change will result in improvement?
- The PDSA cycle to test and implement changes in real work settings. The PDSA cycle guides the test of a change to determine if the change is an improvement.

The driver diagrams and care bundles set out clearly what teams should try to accomplish in their local services.

An early focus of the AWSSIC was data collection. The minimum dataset required to evaluate if the care bundles were being implemented was clearly set out. Stroke services across Wales were encouraged to start collecting this dataset at the beginning of the 12 month programme in order to establish a baseline and to be able to use the results to focus and evaluate service changes.

Teams were also given a Data Collection Tool, in the form of an Excel spreadsheet, developed by Mike Davidge. Once the minimum dataset was inputted for each patient, the data collection tool could be interrogated to display run charts that displayed each team’s performance against the interventions and the bundles for each patient, and could be summarised weekly or monthly.

A small amount of funding was offered to teams to provide one session per week for data inputting for up to three months to get the teams started. Nine of the 14 teams took advantage of this offer.

Teams were encouraged to test out small changes using the Plan-Do-Study-Act (PDSA) model.

This way ideas, theories or hunches of what might make a difference to patient care, could be tested out on one patient, or by one clinician, for one day. If the data shows these tests are successful, these tests can be escalated into wider tests of change and eventually into implemented changes that result in an improvement.
What Happened

Fourteen teams representing the 18 acute hospitals admitting acute stroke patients in Wales were recruited into the Collaborative. The constitution of the teams varied in their representation of managers and clinicians, and the composition of the teams attending the learning sessions changed over the course of the Collaborative. On average, 70 people attended and at least 13 of the 14 teams were represented at each event.

Uptake of data collection varied across Wales, as shown in Figure 4. Some teams started implementing service changes before collecting the baseline data. Other service developments happening in stroke affected the teams’ ability to focus on the collaborative aims. Additional funding made available by the Welsh Assembly Government for extra staffing for acute stroke services was slow to be invested, which had an effect on the capacity to deliver the required interventions.

The site visits by the programme manager were highly valued by the project leads and teams and were important in helping teams interpret the data they were collecting so as to support tests of change.

![Uptake of Data Collection](chart.png)

**Fig 4: Uptake of data collection across the sites November 2008 to July 2009**

Individual teams have been able to demonstrate clinically significant improvements in the reliability of the care they provide to people who have had a stroke. The local reports highlighting these improvements are included in the appendices.
Changes across Wales

The self reported data from ten of the teams has been collated into one database and it is also possible to see some changes in reliability of care on an All-Wales basis. These improvements reflect the impact of the Annual Operating Framework target of co-located stroke beds by March 2009, the additional funding made available to stroke services in October 2008, and the AWSSIC.

Compliance with the First 3 Hours Bundle remains poor across Wales. It remained at zero except for one month when it registered a compliance rate of 2%. Many patients did not present to hospital within 3 hours of onset of symptoms. The graph in Figure 5 highlights the importance of raising public and professional awareness that stroke should be treated as a medical emergency and patients should be directed to their local stroke services as soon as possible.

![Graph: Time from onset of symptoms to admission in Wales from Dec 2008 to Aug 2009]

**Fig 5:** Time from onset of stroke symptoms to presentation at A&E
Compliance with the First 24 Hour Bundle has shown some improvement, as shown in figure 6, but less than 10% of patients in Wales receive all the interventions in the First 24 Hour Bundle in a timely fashion.

There has been a steady improvement in the percentage of people who have a swallow assessment within 24 hours, as shown in figure 7.

Time from admission to hospital to admission to a stroke bed has improved over the 7 month period, as shown in figure 8, but is still not consistently within 24 hours.

The percentage of patients who start regular aspirin within 24 hours, shown in figure 9, remains unreliable. This may be in part due to lack of timely access to CT scanning.
Compliance with the First 3 Day Bundle has improved, as shown in figure 10, with compliance reaching 20% by August 2009.

Individual interventions such as manual handling assessment and early mobilisation have shown a more significant improvement as shown in figures 11 and 12.

Physiotherapy assessment within 72 hours has become more reliable, as seen in figure 13, although it seems to have averaged out around 65%.
Compliance with the First 7 Days Bundle has been stable over the past nine months, as shown in figure 14.

The reliability with which patients’ goals are set within the first seven days has become more reliable, figure 15, although the average remains low.

Although compliance rates with the Bundles remain low, it must be remembered that to comply with a Bundle, all the interventions in the Bundle must be completed within the required time frame for every patient. The graphs for the individual interventions demonstrate much greater improvements, and reflect the efforts of the clinicians involved to improve the care they provide.

Development of a Stroke Trigger Tool

The Global Trigger Tool (GTT)\(^\text{11}\) is a tool designed to measure harm experienced by patients in terms of adverse events. The hospital adverse event rate has been one of the key outcome measures for the 1000 Lives Campaign. As we have used a clinical change model as in the 1000 Lives work we wanted to establish whether the GTT would be useful to measure the impact of implementing the acute care bundles in terms of patient safety and the quality of care for those patients who have suffered a stroke.

The initial pilot was on a small cohort (14 patients) and used the original 1000 Lives GTT to see if it would be sensitive and relevant enough to demonstrate adverse events specifically related to stroke. We then took our findings to the workshop in LS2 and the clinicians identified stroke specific triggers of harm, this adapted tool had 7 new triggers and removed the surgical care module.

The second pilot with the adapted tool (18 patients) was undertaken by the same team as the initial audit in the same District General Hospital. This highlighted an increase in triggers and many of the harms were identified through the new stroke triggers.

We would envisage that through further audit and refinement that we should be able to increase the sensitivity and make the stroke trigger tool more specific. We recognise that the numbers to date are small but the new triggers appear to increase the sensitivity of the GTT and identify harm specific to the stroke population.

This tool may be useful to monitor changes in quality of care and patient safety achieved through the implementation of care bundles for stroke.
Delegate Feedback

Feedback was sought at each event. At the final LS, comments were sought on delegates' experiences of being involved in the Collaborative over the previous nine months:

- “We have been trying to improve stroke services for years, but haphazardly. Having support of AWSSIC has made a huge difference in providing guidance and support continuously - enabling wider participation, a more focussed approach, better data collection. The value has been the structure of regular meetings for information, knowledge and networks. The data collection tool and the continued supportive visits from the programme manager to point us in the right direction reinforce positives and encourage us all”
- “These sessions have been extremely motivational and good for team building within our group and also for making us feel part of the bigger Welsh picture. It would be good to continue these for the Rehab Bundles as I feel we are only just getting started and if it all ends now I hope the progress won’t start to decline”
- “The Collaborative has provided much needed focus and networking. It has provided a forum for clinicians to discuss ideas and ways of enacting delivery. The focus on acute units has delivered, but I would strongly support its continuation to facilitate delivery of the other parts of the stroke pathway”
- “We have learned lots using the database, it’s amazing to see the improvements we have made (small but significant) in the last 6 months. Also the graphs have encouraged staff to improve services within resources which has led to some improvements in patient care. So thank you very much for all your hard work and support - we all appreciate it”
- “Their enthusiasm has been infectious and motivating. The initial engagement of managers has been difficult to sustain and therefore the leadership required to effect change has meant that change anticipated and wanted hasn’t happened”
- “The AWSSIC has been key in driving up standards of care in Wales. The RCP Organisational Audit confirms it. There is so much enthusiasm and energy amongst workers in stroke care now, and this event harnesses it. Please continue”
- “This has been an excellent process which has shown ways of working and changing which do not require investment. If the Rehab/TIA work goes forward it is really important to get the right people involved at the onset (the numbers involved are greater)”
- “Our involvement with AWSSIC has inspired and empowered us as a team to make changes that we can see would improve patient care and without having to wait for edicts or permission from ‘on high’”
- “The process helped our team to identify the areas we needed to change and to focus on the small actions we could all carry out to achieve a big change to improve our stroke patients’ care”
- “Excellent support from AWSSIC really gave our unit the structure and focus needed to start to look in depth at practice. It also gave us the tools we needed to make changes”
Project Leads’ Experiences

It was recognised at the first learning session and in the “How to Guide” that one of the most important factors in the success of the local Collaborative team was the project lead. Guidance was given on choosing a project lead and also on other factors required for the success.

Project leads were supported by the programme manager through e-mails, telephone conferences, regular visits and project leads meetings.

At the final meeting, the project leads were asked to reflect on their experience of being project lead and identify the role, responsibilities, benefits, challenges of being the project lead and their successes and the skills required.

The challenges had included engaging and motivating physicians and local teams in the first instance. With several pieces of work running concurrently with the collaborative, such as the Profession Specific Audit, Annual Operating Framework Monitoring Audit and Local Delivery Plan, the project leads sometimes found it difficult to organise local team meetings and get the commitment needed from senior managers.

Overall the project leads felt they had benefited from being involved in the Collaborative, through developing new knowledge and skills, relating both to clinical practice, service improvement and leadership. They felt that being part of the Collaborative had improved working relationships within their local teams, organisations as well as across Wales. They valued the support and advice from the other project leads. They had been surprised at the power of the data to drive change within teams and invigorate and maintain motivation and interest by demonstrating improvements in patient care.

For further details see:
http://howis.wales.nhs.uk/sites3/Documents/810/Project%5Fleads%5Ffeedback%5FJuly09.doc
Looking Forward- Next Year

The second year of the AWSSIC will follow the same format as year one. The aims of the second year are to help organisations develop services which:

- Prevent stroke through timely management of Transient Ischaemic Attack (TIA)
- Support individuals to achieve their optimal level of functional recovery following stroke

There will be separate teams for the two clinical areas.

The first year of the stroke Collaborative has also helped inform the development of a new way of setting targets for health in Wales. Stroke is one clinical area which is taking forward a combination of organisational indicators; process measures (in the form of driver diagrams; and outcome measures as a way to drive improvements in reliability of patient care. These Intelligent Targets will be incorporated into the Annual Operating Framework for Wales from April 2010.

For more information visit the intranet site:
Conclusion

The AWSSIC has provided an effective service change model to support the Stroke Services Improvement Programme. The Breakthrough Collaborative methodology was successful in engaging 14 teams and in spreading learning on improvement skills. The Driver Diagram, Care Bundles and Collaborative structure provided clinicians and managers delivering acute care with a framework and focus for improving their local services. Their dedication and enthusiasm had led to demonstrable improvements in patient care, and they have valued the structure, support, skills and tools the Collaborative provided them with.

Initial resistance from the clinicians on collecting yet more data changed to enthusiasm once the teams started to use the data to guide and evaluate service changes. Being able to see the impact the changes have had on patient care has motivated the frontline staff to maintain and increase their efforts.

The data collected for the AWSSIC has also built on knowledge from Sentinel Audits, Profession Specific Audits and Annual Operating Framework Monitoring Audits by focussing on real time data and care experienced by patients rather than retrospective assessment of resources. This will help the new health boards in Wales with their planning for acute stroke services, including thrombolysis services, in the future.

There is strong evidence of improved care reliability across Wales during the period of AWSSIC, as outlined in the previous section, but much remains to be achieved if all stroke patients in Wales are to receive reliable care. The first year of the AWSSIC has provided a firm foundation for going on to address TIA and early rehabilitation services next year. Including the driver diagrams in the Intelligent Targets for stroke in the Annual Operating Framework in March 2010 should also help engage physicians, managers and executives in the task of improving the quality of patient care next year.
Appendix One

Individual Team Reports

Each team was asked to submit a short report highlighting the impact the AWSSIC had had on their local service developments.

- North Wales - East
- North Wales - Central
- North West Wales
- Hywel Dda - Bronglais
- Hywel Dda - Withybush
- Hywel Dda - Prince Phillip Hospital
- ABMU - West Division
- ABMU - East Division
- Cwm Taf
- Cardiff - UHW
- Cardiff - Llandough
- Gwent- Royal Gwent Hospital
- Gwent- Nevill Hall Hospital
This year has seen many changes and improvements within our Stroke Service. Long talked about plans have been brought to fruition through a focusing of minds and efforts inspired by the Welsh Stroke Collaborative and in part supported by the Stroke Service Improvement Programme in Wales.

Implementation of the Acute Stroke Care Bundles

Following a slow start, the Bundles have been implemented with a pleasing level of success. Despite the fact that we are not yet achieving 100% compliance with each Bundle as a whole, we are consistently seeing 100% compliance in several of the Bundle elements and others are showing a steady improvement, see figure 16. Compliance has been largely improved by the development of our Combined Stroke Unit (CSU) which opened in April. Figure 17 shows the time from admission to hospital to admission to our CSU.

Prior to the implementation of the Bundles a programme of education and training was provided to staff in the Emergency Department, Medical Assessment Unit and General Medical Wards. Key individuals from each area were nominated to “champion” the bundles and this has been an important factor in their implementation.

A data collection tool has been developed which is incorporated into the Bundles themselves, figure 18. This has been modelled on the existing Sepsis Bundle which was already familiar to staff. By capturing the data in this way staff are provided with a ‘trigger’ to the steps required within each bundle and the data is collected in ‘real’ time. Exceptions and variations to the bundle can be recorded and this offers a useful insight when analysing the data.

A Local Stroke Services Improvement Group has recently been set up within the Stroke Unit. The group consists of multidisciplinary members of the Stroke Team and their remit, along with invited members from other key departments such as Imaging and Pharmacy, is to make the required improvements through a process of evaluation and process redesign. This is being done by analysis of the Bundles compliance data and by using PDSA cycles to facilitate change.
Time from hospital admission to admission to a specialist stroke ward
Wrexham Maelor Hospital Stroke patients
from Mar 2008 to Aug 2009

Fig 17: Chart of time in hours from presentation at hospital to admission to acute stroke ward

Stroke Unit Opened

One patient transferred to medical ward from neurological unit and not referred to stroke unit for 10 days.

Target 24 hours

Not just the bundles.......  

Now we have started we don’t intend to stop with the bundles. By meeting weekly and working collaboratively staff are motivated to make changes and improvements in all areas of our service. We have used PDSA cycles to make improvements in the following areas so far:

- Maximising therapy time by ensuring that patients are adequately prepared and ready for allocated therapy sessions
- Correct positioning of patients for mealtimes
- Introduction of a Stroke Unit information leaflet for patients/relatives
COULD THIS PATIENT HAVE SUFFERED A STROKE OR TIA?

Yes

**FIRST STEP**

Use ROSIER scale to establish provisional diagnosis

**STROKE LIKELY**

Within 24 HRS

**NEXT STEPS**

- Diagnosis confirmed by an experienced clinician
- CT Scan requested
- CT Scan performed
- Physiological monitoring: Consciousness level, BP, Pulse, heart rhythm, blood glucose, oxygen saturation
- Regular dose of aspirin commenced
- Admission to Acute Stroke Unit

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Exception</th>
<th>Sign</th>
</tr>
</thead>
</table>

**Fig 18:** Data collection sheet for first hours and first day bundles in Wrexham Maelor Hospital
What the Welsh Stroke Collaborative has meant to us:

‘The Collaborative has brought management and clinical teams together for one common goal – improving services for patients. It has focused the National Agenda at a local level’

**Jon Falcus – General Manager**

‘My involvement in the Collaborative has motivated me in many ways to develop the services provided by the Stroke Unit. Networking with colleagues from other Trusts in Wales has confirmed to me that our challenges are similar and reassured me that our developments in Wrexham are comparable with the bigger city hospitals. 2009 has been an exciting year so far - we have finally been able to open an acute assessment bay within our existing rehabilitation ward, which had always been mainly stroke focused but never recognised as a Stroke Unit. The implementation of the Acute Stroke Care Bundles has resulted in patients being managed in a more timely and co-ordinated manner and we look forward to being the pilot site for the Early Recovery and Rehabilitation Bundles’

**Carys Griffiths – Stroke Unit Sister**

‘I have had the opportunity to represent physiotherapy in the Stroke Collaborative and in the implementation of the Acute Stroke Care Bundles. We now have an acute assessment bay within our Stroke Unit where daily multidisciplinary ward rounds take place. This has significantly enhanced our interdisciplinary working and there is a real atmosphere of openness and team working within the Unit. As a physiotherapy team we are managing to comply successfully with the three day bundle’

**Danny den Drijver – Senior Physiotherapist**

‘Having the opportunity to be part of the Collaborative has been an important step in the development of stroke awareness and stroke care within our hospital. Having had a clinical interest in stroke for many years, it is rewarding to know that the profile of stroke services has been recognised and raised.

The Stroke Collaborative has facilitated ‘focused’ working in the area of acute stroke care and has resulted in an Occupational Therapy Service redesign, having secured funding for an Occupational Therapist exclusively for stroke care. The work of the Stroke Collaborative has been invaluable and it is imperative that this good work continues into the next phase with the implementation of the Early Recovery and Rehabilitation Bundles.

**Lesley Cotter – Head of Occupational Therapy Services (East)**

‘The role of Project Lead is one I have thoroughly enjoyed although I have found it extremely challenging at times. This has been due mainly to the fact that as a Lead Nurse in Acute Medicine, competing demands often made it difficult to focus on the stroke agenda. Having protected time to attend the Collaborative meetings has been crucial in allowing me the ‘breathing space’ to refocus my thoughts on the job in hand.

I have always had a keen interest in stroke medicine and my participation in the Collaborative reinforced to me that this was what I wanted to do for the long term. The knowledge I have gained has increased my credibility in this area and I have now been appointed as the Stroke Co-ordinator in the East division of our Trust. The contacts I have made through the Collaborative will be invaluable to me as I settle into my new role and I look forward to my continued involvement in the Stroke Services Improvement Programme’

**Lynne Hughes – Stroke Co-ordinator**
Future Plans

We are not complacent – as a team we are only too aware that there is still a huge amount of work to do. In particular, we need to concentrate our efforts on those elements of the Acute Stroke Care Bundles where we are not demonstrating a consistent improvement such as nutritional assessment within 72 hours, estimated date of discharge and multidisciplinary goal setting.

We are also one of the pilot sites for the Early Recovery and Rehabilitation Bundles and we look forward with enthusiasm (and some trepidation) to full participation in this important piece of work.
North Wales NHS Trust, Glan Clywd Hospital

Project Team

- Josie Wray
- Janice Lavelle
- Anna Whitlow
- Maureen Bartley
- Mark Andrews
- Janet Lloyd-Williams
- Yvette Drysdale

Background

Stroke services in Glan Clwyd Hospital have been driven by Josie Wray, Clinical Nurse Manager for many years in partnership with the Physicians - Doctors Adhiyaman, Ganaeshram, Owen, Meara and Greenway working with Mark Andrews, General Manager, to develop a robust plan to provide a better service for patients who have suffered from a stroke. Despite much expertise and enthusiasm, several setbacks have limited the team’s ability to improve stroke care in recent years.

Funding from WAG and support from the SSIP and AWSSIC provided additional momentum to start recruiting the specialist stroke team and co-locating the beds.

Personal Perspectives: Yvette Drysdale

I was introduced to Stroke in August 2008 when on secondment as Assistant General Manager in Medicine. The driver at this time was the National Service Framework for the Older Person which has two standards for Stroke. My job was to assist the team in the achievement of the standards.

The starting point for me at this time was that patients were admitted to Care of the Elderly (COTE) beds and other wards throughout the hospital. With funding from WAG today we have the beginnings of a Specialist Stroke Team (Nurse and Physiotherapist – with Occupational Therapist, Speech and Language Therapist and Psychologist still to recruit) and co-located beds in a newly refurbished ward with an enthusiastic Ward Manager and team.

The All Wales Stroke Services Improvement Collaborative played a key role by empowering professionals who were passionate about the Stroke Agenda providing tools, presentations and excellent networking opportunities. Sharing ideas with colleagues from other Trusts was very useful, learning from each other and developing ideas, avoiding pitfalls that others had been through saved us time and energy. Missing from the collaborative were colleagues from Social Services and the Stroke Association who will be crucial to the next phase of the agenda.

An action plan was written to steer us through the implementation of the specialist acute stroke team – work included updating the operational policy and writing a service specification.

The database supplied by the collaborative was definitely intelligent. It provides graphs at the touch of a button and shows very clearly where further investigation was needed in relation to data that didn’t look or feel right. The attention was focused on particular areas which brought significant improvement in a very short space of time.
Achievements so far

- Improving the patient journey through compliance with care bundles, see figs 19, 20 and 21
- Co-located beds
- Specialist Clinical Lead Nurse
- Specialist Physiotherapist
- Intelligent Targets
- Intranet page for Stroke

**Fig 19:** Percentage of patients who received all interventions in first day bundle

**Fig 20:** Percentage of patients who received all interventions in three day bundle

**Fig 21:** Time from admission to hospital to admission to stroke bed
Still to do

- Recruitment to rest of team
- Location of rehab and acute services in one place
- Improving services in community settings
- Robust pathway for total patient journey

To progress the stroke agenda further the continuation of the collaborative is essential to harness enthusiasm and motivate individuals facilitating the achievement of long held goals.

Personal Perspectives: Maureen Bartley – Physio

I came into post as the Clinical Specialist physiotherapist mid-way through the Collaborative’s work, on 1st of March, 2009.

I was already aware of the targets set by AWSSIC and I used these as part of my template for the job. There was no other specific precedent on site here, as it is a brand new post. To have this sort of guidance published has been immensely helpful. Not only have I got clear targets for my own practise, but I can see how they fit into the whole picture of the service the team is aiming to provide.

Having clear guidance on Day 1 meant that I could immediately identify issues with getting referrals through to me. I was able to introduce a system new to the in-patient physiotherapy service, whereby I proactively seek referrals at the Acute Medical Unit stage. This has meant me working closely with the Assessment & Discharge MDT based on AMU. It has been invaluable to have the live data collection because it means that I have some very important aspects of my service audited regularly.

It has been very encouraging to see from these figures that we are achieving excellent levels of assessment and intervention. In the last two months 90% of patients have had a physiotherapy assessment and been mobilised or sat out within 72 hours, for which I share credit with many other colleagues, see figs 22 and 23. Having these as a published target gave me the confidence to get others to engage with these goals.

![Fig 22: Percentage of patients who were assessed by a physiotherapist within 72 hours](image1)

![Fig 23: Percentage of patients who were sat out of bed or mobilised within 72 hours](image2)
Since becoming involved with the AWSSIC in 2008, there are some changes which have occurred in the acute setting of the co-located Stroke beds at Ysbyty Gwynedd. These small changes have made a difference to care delivery and have improved the quality of service.

Project Team:

- Dr. Salah Elghenzai – Clinical Lead for Stroke
- Penny Morgan – Senior Nurse, Community Hospital
- Rhian Wyn – Head of Speech and Language Therapists (Adult Services)
- Enlli Prytherch – Junior Sister (Acute Ward)
- Debbie Jones – Staff Nurse (Community Hospital)
- Rhian Owen – Stroke Specialist Nurse

Debbie Jones and Rhian Owen were not able to attend the first learning session, but Eleri Roberts – Assistant Directorate Manager joined the team.

No-one was able to attend the second learning session, and only Rhian Owen, the designated project lead was able to attend the final learning session.

On hindsight, involving professionals from the community (rehabilitation setting) was probably the wrong decision at this stage as they were not involved in acute stroke care. Neither they nor the senior nurse were able to support or influence the changes required in practice. However, their experience and knowledge will be of value when the rehabilitation bundles are introduced next year.

Compliance with Care Bundles:

Generally, acceptance and compliance of the Bundles have been consistently good, but there are aspects of the Bundles which we were unable to influence in order to improve practice.
Compliance with First Three Days and First 7 Days Bundles have been intermittently achievable and have demonstrated immense changes in some aspects of practice, namely the degree of consistency of the care delivered regarding nutrition, as shown in figure 24.

An initial problem in achieving compliance with the First Three Days Bundle was not the actual actions or care required, but the wording on the Bundle sheets. Many staff did not associate “physiological monitoring” with basic neurological observations. Explanation of the terminology was required in order to achieve the intervention. However, although all other monitoring is performed, heart rhythm is not observed, resulting in failure in compliance with the intervention, as shown in figure 25.

However First Hours and First 24 Hours Bundles have proved difficult to influence and achieve. This is mainly because ROSIER is not used in A&E Department and currently there are no direct admissions onto the Ward. The delay in transfer from A&E to the co-located stroke beds is shown in figure 26. This situation will change due to the impending opening (Jan 2010) of a ten bedded Acute Stroke Unit. Direct admissions will enable staff to improve compliance and so First Hours and First 24 Hours Bundles will be achievable.
Compliance with CT Scanning within 24hrs remains an issue, as shown in figure 27. Although there are some improvements, delays still occur. Maintaining consistency within this standard appears extremely difficult.

In May 2009, funding was obtained for a Specialist Physiotherapist, Occupational Therapist and Speech and Language Therapist to work with Stroke patients. As a result, an increase in the number of patients mobilised immediately after Stroke has improved, compliance with the 72hr standard is now consistently being achieved, as shown in figures 28 and 29.
Achievements:
Initially the Project Team was faced with the enormous task of trying to bring about change through the introduction of Care Bundles. Although the changes that have occurred (without the need for extra resources) may be small, improvements in the delivery of care are apparent. Not only has the quality of care improved, but the consistency of that care has increased dramatically.

Although Care Bundles illustrate our achievements, they also highlight weaknesses in the service. Continuous data collection by the Ward Clark enables us to target the next required improvement in practice.

Secure funding for the continuation of data collection has been agreed by the Executive Board, without this administrative support the work would not be achievable. Good quality data collection will provide an invaluable resource base on which our practice can build.

Conclusion:
During this period of the AWSSIC Programme, small changes have taken place in Prysor Ward, Ysbyty Gwynedd. Care Bundles have been implemented, which results in consistency of care. Data is being collected which will allow reflection on practice and will be an invaluable tool in highlighting areas in need of improvement. Current data ensures our practice is evidence-based and relevant to our area. Demonstrating outcomes (performance graphs on Ward information board) resulted in some positive feedback from clinical staff, and inspired them to continue with the work.

Personally, I have found being part of the AWSSIC a very interesting and challenging journey. I would like to thank NLIAH and AWSSIC for all their support. Also I would like to thank all the health professionals involved in Acute Stroke Care, for their patience, tolerance and commitment to change.

Compliance with the First Seven Days bundle for assessment from the Occupational Therapist is unpredictable, as shown in figure 30. Unfortunately, there is no specific aspect in any Bundle relating to a communication assessment. As a result it is impossible to monitor whether Speech and Language services have improved after the funding.

Fig 30: Percentage of people who have an OT assessment within 7 days

![Fig 30: Percentage of people who have an OT assessment within 7 days](chart.png)
**Hywel Dda NHS Trust, Bronglais Hospital**

**Where we were:**

Bronglais Hospital has had a stroke unit of some description for many years, set up by staff with no additional funding. We have a good, committed multidisciplinary team but no psychologist. We have had weekly multi-disciplinary meetings for years, with patients and relatives. We have participated in the RCP Sentinel Audit and the Profession Specific Audits.

**What we have done:**

- Co-located beds with 4 acute monitored beds on the rehab ward
- Introduced a stroke protocol for A&E along with the ROSIER scale and data collection tools
- Developed data collection tools and started entering data onto the database
- Reviewed different measures and introduced Modified Barthel as main outcome measure, and trained staff
- Introduced therapy communication sheet to be placed at end of bed to ensure good communication between nursing staff, speech and language therapist, physiotherapist and occupational therapist
- We’ve agreed where all Bundle information is to be stored and therapists ensure they complete relevant sections each week
- Introduced an agreed standard of education and topics for all staff and commenced the training

**Ongoing work:**

We are in the process of agreeing an appropriate information pack for stroke patients, to include a ward leaflet outlining the patient journey on the ward, and appropriate Stroke Association leaflets – to be given on arrival.

We have set up regular team meetings to maintain the impetus of the Collaborative to ensure we see actions completed, engage with all involved parties, and continue to progress.

We have introduced goal setting, initially involving nurses and therapists, to be recorded in the medical notes. This needs practice and development which we hope will be supported by the continuation of funding for the rehab stages.

**The benefits:**

We did not attend the first AWSSIC learning session but have attended all subsequent ones. We did have a feeling of being a bit behind as a result, even though we already had some good systems in place, including regular MDT meetings and excellent team working. However, our views are that firstly, the sessions were successful in revitalising our team feeling, with time out of work to reflect on what we were doing on the ward and how we could improve. Secondly, we found it heartening that we were all in the same boat, that nobody else had everything perfectly sorted, that there were some bits we were doing well. It was really useful meeting up with others, exchanging ideas, having a sense of working together in Wales to improve services – that patients across Wales should have access to the same level of care. It has also led to improved morale on the ward, with more staff members becoming engaged – with a ripple effect e.g. two different members of nursing staff attending the Welsh Stroke Conference, and a whole team of nursing/therapy staff are participating in the Stroke Association Tree Tops Challenge in October.

Additionally, it has led the way for a more cohesive approach to stroke care across Hywel Dda Trust and has enabled us to proceed with standardising what we can in all areas. Initial work has been around agreeing competencies and education for nursing staff.
The negatives:

We have not been able to think of any particular negatives. There are always issues about staff time, maintaining enthusiasm and not spending too long having too many meetings. And that is where continuing the Collaborative will be really useful in supporting us. It has been thought-provoking and fun!!!

Lorraine Jones, Senior Nurse Manager, Medicine, Bronglais Hospital

Moya Neal, Deputy Head of Occupational Therapy/Stroke Specialist, Bronglais Hospital

Claire Rose, Senior Physiotherapist, Bronglais Hospital
The stroke unit at Withybum General Hospital is comprised of 6 acute stroke unit (ASU) beds and 8 stroke rehabilitation beds as part of a 26 bed ward.

Our achievements illustrate the success of the Collaborative and commitment of the multidisciplinary team in Pembrokeshire. At the start of the Collaborative a year ago it seemed a daunting task to collect all the relevant data in accordance with the Care Bundles. However we were able, with a few adjustments, to utilise our present stroke database proforma to achieve this.

The multidisciplinary team is comprised of:

- Dr Chris James, Consultant Physician
- Dr Ruban, Consultant Physician
- Louise Coombe, Stroke CNS, Project Lead
- Anna Curtis, Assistant Stroke CNS, Project lead
- Jillian Turfery, Senior Physiotherapist
- Sue Phillips, Senior Occupational Therapist
- Liz Green, Senior Dietician
- Jan Sheldrick, Specialist Speech and Language Therapist

Collecting the data has enabled us to see if we are compliant with the Bundles of care for stroke and where and how we could make improvements. Through the use of PDSA cycles (Plan, Do Study, Act) we have made demonstrable improvements in care as follows.

**PDSAs in Progress**

1. **Swallow assessment completed in 24 hours.**

   We recognised a need for improvement in this area, as highlighted by the data collection and as the speech therapists and CNS already had a training package in place it seemed appropriate to utilise.

   The objective was for all acute stroke patients to have a swallow screening test within 24 hours of admission. In response, all qualified nursing staff on the Adult Clinical Decision Unit (ACDU) and ASU were trained to perform a swallow screening test on stroke patients using a validated screening tool. The results can be seen in Fig 31.

   **The Future**
   - Continue to collect data
   - Regular feedback to clinical staff on compliance to the standard
   - Offer six monthly update sessions to new and existing nursing staff on swallow screening.

2. **Nutritional Screening completed in 72 hours**

   Participation in the National Sentinel Stroke Audit and Care Bundle data collection highlighted the need to improve the standard of nutritional screening. The objective for this PDSA was for all acute stroke patients to have a nutritional screening tool completed accurately within 3 days of admission, in line with RCP guidelines.

   Training on nutritional screening had previously been carried out by the dietician on ASU and ACDU. The CNS in Stroke revisited nurses’ understanding of the need to use the nutritional screening tool to ensure nurses were competent in using the tool, identify any unmet training needs and reiterate the importance of timely nutritional screening for stroke. The outcome can be seen in Figure 32.
The Future

- Revised Hywel Dda NHS Trust screening tool to be rolled out.
- Training to be carried out by Dieticians and newly appointed Nutrition Specialist Nurse.
- Continue to collect data.
- Regular feedback to clinical staff on compliance to the standard.

Our Plans for the Future

Sustaining the improvements made to date in addition to continuing to review performance in other areas where compliance against the RCP guidelines could be improved is integral to providing a robust stroke service.

An area of priority is to improve access to the ASU and a further PDSA is planned to enable safe and effective patient flow for acute stroke and stroke rehabilitation patients. The aim is to meet the RCP criteria for acute stroke units; ensuring patients reach an ASU bed within 4 hours of admission.

In planning the test of change, A&E staff, Physicians, ASU staff, Bed Managers and Radiology will be consulted to agree the pathway for the pilot and to agree the level of medical assessment required in A&E.

The Rosier score will be introduced in A&E to determine those who fit the criteria for direct admission to ASU.

In reviewing the success of the PDSA, we will measure those patients who reach ASU within 4 hours of admission and review any obstacles to direct admission and patient flow through ASU and stroke rehabilitation beds.

The multidisciplinary team is committed to continuing to collect data in accordance with the Care Bundles to improve patient care and will continue to educate staff on the Care Bundles and AWISSC developments to improve engagement and involvement from all those involved in the patient pathway.

Participation in AWISSC events will continue and Pembrokeshire have been invited and are planning to participate in the piloting of the Rehabilitation Care Bundle.

We would like to thank everyone who has participated in our improvements.

Anna Curtis Assistant Stroke CNS.
Introduction

The data sets have been completed in 2 sites; Morriston and Singleton. A variety of ways were considered when deciding how to collect and collate the data, both sites opted for a folder on the ward to be completed by all the multidisciplinary team (MDT). The sheets are then inputted into the database by various members of the MDT.

The database has given us a clear indication of what we do well, what we could do better, and given us the opportunity to decide what we are going to do now. This is our Collaborative journey.

What we do well

There has been a dramatic improvement in our compliance with the First Three Days Care Bundle, in August we reached a 75% compliance rate, shown in figure 33. This is, in part, due to the improvement in admission to stroke ward times – in August these fell to an average of 38.18 hours. This improvement in admission times has also led to an improvement in physiological monitoring and manual handling assessment compliance both reaching 100%. Nutritional screening and physiotherapy assessment both reached 100% in August but consistently achieved 80% prior to August 2009.

There is clearly still room for improvement and these 100% compliance rates must be maintained whilst improving getting patients out of bed, this is still a low 75% but the graphs demonstrate a steady improvement. So we are heading in the right direction.

Another element heading in the right direction is our length of stay which shows a steady decline since April 2009, in figure 34. This coincides with the introduction of a pilot Early Supported Discharge Scheme (ESDS), and it could be attributed solely to this although it is more likely that the introduction of the scheme has focused the MDT into more effective and efficient discharge planning with the knowledge that a stroke specific service exists for the patient on discharge.
What we could do better

Our First Hours and First Day Bundle compliance remains very poor across both sites. There is a consistent 0% compliance with the first hours bundle, and this is down to the ROSIER not being used unless the patient fits the criteria for Thrombolysis. Stat Aspirin is also not being given although there is some debate whether this may be removed from the Bundle due to lack of evidence and consensus as to its effectiveness. The First Hours Bundle also shows a variable but consistently low rate of compliance. However, certain areas of this Bundle are improving for example CT within 24 hours has peaked at 75% with a low of 52%, so even on a bad day we can still scan more than half of our patients within 24 hours of admission. Swallowing screening is another area that has produced very impressive improvements, consistently achieving an 80% compliance rate. This has been attributed to the hugely successful swallowing screening program, which involved Speech and Language therapists training nursing staff on key wards to use the screening tool.

The First Seven Days Bundle also shows poor compliance in figure 35 and this is consistent in all aspects of the bundle.

What we are going to do next

Both the First Day and Seven Days Bundles are areas of concern to the team and work is already underway to address these problem areas. The team believe that direct admission to the stroke unit would solve the poor compliance with regular aspirin prescription and improve time to CT scan as direct admission would negate the need for another referral onto the stroke team, which consistently wastes valuable time. A direct admissions policy is being written and the Trust plans to start this in October 2009. Direct admission will also mean that patients are on the right ward at the right time, making the right equipment and right people available. This will, for example, enable more patients to get out of bed earlier as the correct seating is available on the “stroke” ward.

The Seven Day Bundle is an area which clearly requires a great deal of work and discussions have already taken place within the MDT. Figure 36 shows the OT compliance rates at Morriston.
From this it is clear that the variability is huge and consistency has not yet been achieved, however the OT has suggested that a rapid assessment sheet be developed in conjunction with Physiotherapy. This should enable resources to be pooled, duplication will be reduced and it will generally improve the patient journey by providing all assessments, by the right professions, in a timely manner. This is being drafted and should be ready to use by October 2009.

The other areas of concern are centred around the MDT goal setting, EDD and information sharing with patients and carers. The likely introduction of the Stroke Intelligent Targets (IT) should have a big impact on the goal setting and EDD, the team have discussed this and are keen to implement them in October 2009, once the stroke pathway has been finalised. The information for patients and carers has been addressed and a service specific leaflet has been produced which tells patients what they can expect of the service and where their treatment is likely to occur. Individual therapies are also trying to devise leaflets that should link nicely with the stroke IT paperwork.

What we have learnt

Swansea have had a representative team at all three learning sessions, however this has not meant that the process has been easy, far from it. The challenge has been to involve “middle management” and highlight the relevance and importance of the data being collected.

Communication has been difficult and this was not helped by the team only meeting twice, both of which were right at the beginning of the Collaborative. There have been lots of small changes but as a team we have not met to evaluate the data which would be a very useful exercise and may have produced a more coherent approach to problem solving.

On the whole the process has been a huge learning curve for everyone involved as the Collaborative has challenged the way we, as individual professions, work and function as a team and the effect this has on the patient journey. The most important lesson we have learnt is that we can make changes and, however small, they can improve the patient experience.

The Future

Since starting our Collaborative journey, we have made some improvements to the patient journey and the graphs clearly demonstrate that we are moving in the right direction. In October 2009 Morriston will have an Acute Stroke Unit with a direct admission policy from A&E. Patients will then be transferred to the appropriate sub-acute/rehabilitation area in either Singleton or Cimla Hospital.

We still have a long way to go but by continuing to use the tools given to us by the Collaborative we are confident that we can make and monitor changes that will enhance our stroke service and improve the patient journey.
Abertawe Bro Morgannwg University NHS Trust, Princess of Wales Hospital

Project Leads: Kath Roche and Claire Jones

At the Princess of Wales Hospital, a supportive multidisciplinary team (MDT) is working well in order to take forward new initiatives in stroke service delivery. Our stroke beds have been co-located since January 2008 as nursing and therapy staff continue to find positive ways of working together across the acute and rehabilitation phases of stroke recovery.

At the first All Wales Stroke Services Improvement Collaborative (AWSSIC) meeting in November 2008, the Princess of Wales Hospital was represented by a range of high-level managerial colleagues. On reflection this was an inappropriate audience. The most difficult challenge, as Project Lead, was to return from an enthusiastic meeting with AWSSIC and NLIAH to a busy clinical area and engage with ward-based colleagues about the benefits of yet more change!

There was no doubt that our team needed ward staff to join subsequent AWSSIC meetings. However, this remained a problem as low staffing levels made release of staff impossible. Nevertheless, NLIAH willingly brought the Collaborative to the Trust! We have been well supported with visits and short presentations in an effort to share the principles and benefits of care bundles in stroke care.

Achievements:

- We have collected and input data since December 2008. This has given us baseline graphs for all the Care Bundles. We are aware that there is much to do in improving elements of and achieving whole Care Bundles
- The Trust’s Integrated Care Pathway for Stroke now incorporates all the Care Bundles as part of the documentation
- The evidence we are collecting not only means the patient will receive the right intervention at the right time and in the right place, but it will also inform and contribute to the development of a Trust-wide Direct Admission Policy for our stroke patients

There have been significant improvements in some areas, as shown in figures 37 and 38.

Fig 37: Time from admission to A&E to admission to co-located stroke bed
Manual handling and nutritional risk assessments are carried out on all admissions to hospital. As the graphs in figures 39 and 40 show there is room for improvement in both areas.

**Fig 38:** Percentage of people who have a manual handling assessment within 72 hours

**Fig 39:** Percentage of patients who are nutritionally screened within 72 hours

**Fig 40:** Percentage of patients who are assessed by a physiotherapist within 72 hours
It is very encouraging to see that the physiotherapy data on these graphs is moving in the right direction. There is awareness amongst the physiotherapists that even when a patient cannot receive therapy it is important to document that an assessment has been made.

In summary, our initial period of work with the AWSSIC and NLIAH has been challenging but positive and is a step in the right direction in improving stroke service delivery for our patients at our hospital.

We look forward to future work with our AWSSIC colleagues in the development of TIA and Stroke Rehabilitation Care Bundles.

**Fig 41:** Percentage of patients who were sat out or mobilised within 72 hours

**Fig 42:** Percentage of patients who received all interventions in First 3 Hours Bundle
Cwm Taf NHS Trust

Project Lead: Gillian Bowtell, Clinical Director of Therapies

Implementing the Care Bundles as part of the Welsh Stroke Services Improvement Collaborative has certainly been a challenge within Cwm Taf NHS Trust.

The Project Team consisted of Stroke Physicians, Senior Nurses for Acute Medicine, Head Occupational Therapist, Superintendent Physiotherapist & Clinical Nurse Specialist–Stroke Care.

From a clinical leadership and management viewpoint the decision was made to work as one team for the Trust in order to enhance working practices across the Trust.

Implementing the Care Bundles

The Project Team had varied experience of using Integrated Care Pathways but the concept of a Care Bundle was a new approach for all of us.

A review of the literature endorses that implementation of the bundles requires a team effort with comprehensive assessments needed to be performed by all multidisciplinary team members. In view of the limited resources of Allied Health Professions for the acute co-located beds, this responsibility has been ultimately placed to the Senior Staff Nurse for Acute Stroke Care to gather data prospectively.

It is fair to say that implementation of the Care Bundles requires effective communication. The change from a uni-professional approach to a team approach to achieve all the components outlined in the care bundles would be a new concept to work with. Dissemination of the purpose of the Care Bundles was one of the many challenges; namely due to the number of sites needed to be covered. The AWSSIC programme manager was fundamental in this process coming to talk to clinical staff.

Retrospective data collecting was the biggest challenge and took a considerable amount of time to complete. This ultimately was tasked to one person from the project team, since it was easier to release one person from clinical duties rather than all the team.

The databases are now up and running and members of the MDT are surprised at how much data it has yielded and how this data can be analysed. The benefit of maintaining the database is that we have a process that is able to capture process variation over time. The graphs created by the stroke database allow us to analyse the variation of key stroke indicators in our service on a monthly basis. We are therefore able to look at current capacity to deliver a timely service and also for measuring the effect that any changes made to the systems of working have.

It has been agreed that data will be shared with the MDT on a month-by-month basis whereby the team are able to discuss if variances occurred and the reasons why. The graphs are powerful evidence to identify resource deficits and if there were processes out of our control (such as infection, equipment issues, etc).

Within the North of the Trust, a checklist has been devised to monitor implementation of the Care Bundles with great success, whereas the South continue to use the original format as outlined by AWSSIC.

Whilst it is too early to note improvement with outcomes, the retrospective data has indicated to the team areas where we need to focus on and this has been incorporated in the Trust’s Local Delivery Plan which is reviewed quarterly via the Stroke Services Steering Group which meet on a monthly basis.

Conclusion

The delivery of quality patient care remains a challenge in today’s health economy especially where resources are finite. The Care Bundle approach provides a practical tool to implement evidence-based practice and most importantly improving patient care.
Cardiff and Vale NHS Trust, University Hospital of Wales (UHW)

Tom Hughes – Consultant Neurologist

The work of the AWSSIC has provided an opportunity for hospitals in Wales to look at the standard of stroke care they are providing and more importantly to collect data about any claims made; good or bad.

The first challenge we encountered was ensuring that all the professionals involved had a useful understanding of what the AWSSIC goals were and of their relevance to clinical practice in the future, in particular how the collected data would inform opinion about the performance of different stroke units. The initiatives in stroke care produced a number of different groups operating at local, regional and national levels and it was difficult for all members of the UHW Stroke Care Improvement Group to appreciate the goals of the different groups. However, over time it became apparent that data collection was the most useful way to find out what the baseline of practice was at different stages of the stroke pathway and the most useful information to help change the quality of the service provided. Data collection has provided the most useful way of monitoring performance in areas like acute care and Accident and Emergency and it is now apparent that the same principles can be applied to stroke care.

The second challenge was to ensure that all the members of the Stroke Care Improvement Group, clinicians and managers had the same commitment to the AWSSIC project. It was difficult to get a uniform sense of ownership within the group and work done by some was not made known to others and there was some duplication of effort. As the relevance of the data collection became apparent we recruited the help of an excellent ward clerk to enter data on the Stroke Unit over a four-week period. This allowed us to set up the database for UHW and to better understand the way in which the data would inform discussions about service development. However, this action did not lead to a sustainable method of data collection and may have camouflaged the lack of a more collective effort by clinicians and managers alike.

However, the arrival of the Stroke Care Coordinator (SCC) should change the sentiment of the interaction between Cardiff and Vale-based professionals and outside agencies like NLIAH. The SCCs - one in Llandough and one in UHW - should be able to collect and enter data and are well placed to take a lead in the interaction with all the bodies seeking to scrutinise and improve stroke services.

Figures 43 and 44 show the changes that have occurred since the SCC started in June.
It now seems unthinkable that we have not been collecting data like this as a matter of routine but at the same time it highlights how little information of real clinical relevance can be obtained from the existing Information Technology systems in the hospital trusts. This may be something that needs to be raised at a national level so that in the future the data which is already collected by Trusts is augmented to ensure that it provides information about performance at different stages of the patient journey.

As the awareness of the project has increased and participation has increased this has helped professionals to sustain their interest and focus their attention. However, it is apparent that for services to change in the way that is required the same message needs to be heard at Welsh Assembly level, Trust Board level and at the bed or trolley-side and the simpler the message or mandate the more likely it is to change opinion and practice. If professionals are able to opt out of initiatives like this without immediate consequences it is difficult to get the uniform commitment that is required to ensure success.
Cardiff and Vale NHS Trust, University Hospital Llandough

A number of exciting developments in acute stroke care have occurred in University Hospital Llandough (UHL) since the inception of the Collaborative.

- UHL Stroke Rehabilitation Ward, East 3, has evolved into a combined stroke unit and now has six beds allocated to the management of acute stroke
- The six new acute beds have been furnished with monitoring equipment suitable to perform the continuous physiological monitoring required for the first 24 hours bundle
- Four new band six nursing posts have been created on East 3 to accommodate the increased level of dependence experienced by patients admitted with acute stroke
- An acute stroke team consisting of a stroke care co-ordinator, a stroke specialist physiotherapist and a stroke specialist speech and language therapist have been employed to assess and treat acute stroke patients both on East 3 and throughout the hospital
- An acute stroke pathway has been developed that integrates the three care bundles and is now routinely used as the primary health care record for patients admitted to the acute beds on East 3

These five measures have provided UHL with a robust platform for the establishment of an effective acute stroke service. The care bundles for acute stroke have provided an excellent frame work around which to structure the provision of this service and the Collaborative has been an invaluable resource in planning and evaluating the effectiveness of these changes.

Involvement with AWSSIC

Being able to access the collective experience of all the acute stroke teams across Wales has been exceptionally helpful. AWSSIC helped to develop these relationships and actively supported the free exchange of information and ideas. A number of obstacles that the UHL acute team encountered on the route to establishing their service had been overcome in other parts of Wales. Sharing solutions to these problems saved time and allowed the team to maintain the momentum of change.

The learning sessions provided by the Collaborative proved very useful in terms of expanding the skill set of those that attended and bolstering their confidence to champion the cause of acute stroke.

Plans for the future

With the acute service now in place at UHL, the focus of our efforts for the next year will be aimed at improving our compliance with the Care Bundles. Measures that will help us achieve this goal include;

- The establishment of a swallow screen teaching program for all staff that will be seeing and assessing stroke patients out of hours
- The formulation of an emergency admissions acute stroke pathway to improve compliance with the First Day bundles.
- The formulation of a specific thrombolysis pathway to build on the existing work of the IST-3 trial and expand the service to include out of hours thrombolysis
- Re-evaluation of both the acute and rehabilitation stroke pathways to reflect the new services and better integrate the acute and early rehabilitation phases of stroke
- The introduction of a rolling program of teaching sessions to disseminate knowledge of acute stroke care needs to the multitude of professionals indirectly involved in stroke care
Gwent Healthcare Trust, Royal Gwent Hospital (RGH)

Collaborative Team:
- Kylie Crook, CNS for Stroke (Project Lead)
- Leona McInnes, Occupational Therapist
- Rachel Wainwright, Physiotherapist
- Russell Walker, Speech and Language Therapist

We began in November with a three-line-whip from Dr Anne Freeman compelling us to attend something with an alphabet soup of acronyms; something about stroke improvement; something about a day away and a free lunch. We ended the day as a “gang of four”- Rachel Wainwright, physiotherapy, Leona McInnes, occupational therapy, Russell Walker, speech and language therapy and Kylie Crook, clinical nurse specialist for stroke. We were tasked with the job of collecting data on how the RGH was meeting (or not meeting as was more the case) the target bundles of stroke care in the first seven days of an acute admission.

The Good News

Very quickly, Kylie, our team leader, redesigned her usual proforma into an efficient way of collecting the needed data and storing in one place. After some initial teething problems and the inevitable anxiety of using a cumbersome looking database, the team began inputting data. By the second learning session, we had made a good start and by the third, we had 260 plus patients on the database. Some things we were doing well, as shown in figure 45.

The Bad News

There were significant gaps in the database that spread across the first three bundles. These included:
- No ROSIER screen completed in A&E/MAU in the first hours bundle
- Inconsistent CT scanning, dysphagia screening and direct ASU admissions from the First Day Bundle
- Gaps in recording of manual handling assessments, nutritional screens and early patient mobilisation in the first three days bundle

At one stage of the process, we were achieving all four bundles, but gaps quickly appeared. Some of these gaps were a problem with documentation and some were the result of activities that were simply not done.
But there was more good news

The data collected helped us focus on areas that needed to be addressed. We began a PDSA on use of the Barthel Scores in order to get an “easy win,” which we were in fact able to achieve. On a more significant therapeutic area, Physiotherapy began an outreach service to the Medical Assessment Unit in order to quickly identify patients needing mobilisation, advice on pain, etc., thus improving on the First Three Days Bundle requiring physiotherapy assessments (figure 46) and early patient mobilisation.

Oh, more bad news

Early on we realised that our team was lacking in medical, nursing and managerial representation. Consequently, it was much more difficult to affect change at the First Hours bundle, i.e. ROSIER scale, or at the Third Day Bundle i.e. manual handling assessments and nutritional screens. And without managerial representation, we lacked clout to ensure these goals were met. And very early on, we realised that when Kylie was away, the data did not always get collected. Our project was VERY dependent on the presence of one member of the team.

But a final bit of good news

All of that said, we achieved a great deal by simply collecting the data. We now know where the gaps are. We have seen that with a focused, PDSA approach as in the physiotherapy and Barthel projects, we can achieve change rapidly. We now have data to approach management, medics and the rest of the MDT to help us achieve our goals. We have approached the nursing education manager in A&E who is now helping us implement the ROSIER screening tool. Data collection has indeed helped us make cases for what has to be done, such as improvements in the First 7 Days Bundle, figure 47.

It takes more than a “gang of four” to achieve this, but the AWSSIC project has given us a good start, and given us the tools to really change the way we provide stroke services at the Royal Gwent Hospital.
Gwent Healthcare Trust, Nevill Hall Hospital

The Acute Stroke Unit at Nevill Hall is based on ward 2/4. It takes approximately 350 acute strokes per year on a 22-bedded Acute Stroke Unit and General Rehabilitation Ward. There are four ring-fenced acute stroke beds, although the definition of ring-fenced remains a little unclear. There is now a direct admission policy, and all strokes are accepted onto the Acute Stroke Unit.

The Multidisciplinary Team consists of:
- 2 Stroke Consultants
- 2 CNS Stroke
- 3 Physiotherapists
- 1 Occupational Therapist
- 1 Speech & Language therapist
- 1 Dietician
- 2 Rehabilitation Assistants
- 1 Ward Manager
- Registered and Unregistered nursing staff

AWSSIC

A strong multidisciplinary team (MDT) attended the first meeting in November 2007. Since then the local AWSSIC team has met every 6-8 weeks. The MDT is highly motivated. The strength of the team comes from working together on a daily basis and the longevity of the working relationships.

Areas of weakness were identified through ….
- Audit, including the RCP Sentinel Audit
- Monitoring Care Bundles
- Satisfaction questionnaires
- Carers’ clinic
- Informal complaints
- Group discussion
- Bed crisis

These weaknesses included …
1. No sustainable method of data collection
2. Patients’ weight not clearly documented
3. Lack of dietetic stroke protocols
4. No ‘Time’ on Manual Handling Assessments
5. Acute areas not familiar with ROSIER
6. No evidence of information given to carers
7. No Barthel score done on discharge
8. OT and PT initial assessments not recorded consistently in patient notes
9. Assessment and rehabilitation lacking at weekends
10. No clear Admission Policy to ASU
11. No SALT screening for communication issues in First Days Bundle
12. Lack of awareness of our work with NLIAH amongst other colleagues
What We Did….

We tried some simple solutions- we invented a sticker for everything:
1. Redesigned data collection form and agreed where to keep it
2. Adapted ward transfer sticker
3. Dietetics – redesigned sticker for notes
4. Added date and times to manual handling assessments
5. Carried out ROSIER training in acute areas
6. Introduced a checklist sticker for information packs given to patient/carers
7. Amended Barthel score sheet
8. OT & PT introduced assessment stickers
9. Two Rehabilitation Assistants and one qualified physiotherapist to cover weekends
10. Managers and clinicians agreed the ‘Ring Fenced Bed’ and ‘Direct Admission’ policies
11. Speech and Language Therapist accepting blanket stroke patient referrals
12. CNS provided update sessions on stroke developments for ward staff

Obstacles Encountered:
- Lack of clerical support for data inputting
- Extra work – data collection
- Low on medical colleagues’ agenda
- Physiological monitoring installation delay
- Staff on leave
- Keeping all staff on board
- SO MUCH ELSE GOING ON!

Benefits So Far ….
- Improved Bundle success – but could do better, figure 48, 49, 50 and 51
- Enhanced patient care including 7-day Rehab
- A chance to evaluate and evidence what we were already doing
- Strengthening working relationships
- Promoted stroke service awareness across the local and wider areas
% compliance with First 3 Days bundle  
Nevill Hall Stroke patients  
from Apr 2009 to Aug 2009  

![Graph showing % compliance with First 3 Days bundle for Nevill Hall Stroke patients from Apr 2009 to Aug 2009.](image1)

**Fig 48:** Percentage of patients who received all interventions in 3 day bundle

Time from admission to admission to a specialist ward  
Nevill Hall Stroke patients  
from Apr 2009 to Aug 2009  

![Graph showing time from admission to admission to a specialist ward for Nevill Hall Stroke patients from Apr 2009 to Aug 2009.](image2)

**Fig 49:** Time from admission to A&E to admission to stroke bed

% patients who have a manual handling assessment in first 72 hours  
Nevill Hall Stroke patients  
from Apr 2009 to Aug 2009  

![Graph showing % patients who have a manual handling assessment in first 72 hours for Nevill Hall Stroke patients from Apr 2009 to Aug 2009.](image3)

**Fig 50:** Percentage of patients who had a manual handling assessment within 72 hours

% patients who were sat out of bed or mobilised in first 72 hours  
Nevill Hall Stroke patients  
from Apr 2009 to Aug 2009  

![Graph showing % patients who were sat out of bed or mobilised in first 72 hours for Nevill Hall Stroke patients from Apr 2009 to Aug 2009.](image4)

**Fig 51:** Percentage of patients sat out of bed or mobilised within 72 hours
## Appendix Two: Stroke Trigger Tool

<table>
<thead>
<tr>
<th>Name of reviewer</th>
<th>Month/Year</th>
<th>Number</th>
<th>CORPORATE / DIVISIONAL (please state)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### General Care Module

<table>
<thead>
<tr>
<th>TRIGGER CODE</th>
<th>TRIGGER Indicate if yes</th>
<th>EVENT Indicate if yes</th>
<th>EVENT SEVERITY (E-I)</th>
<th>EVENT DESCRIPTION/COMMENTS</th>
</tr>
</thead>
</table>

- **Lack of early warning score requiring response**
  - G1

- **Any patient fall**
  - G2

- **Decubiti**
  - G3

- **Readmission within 30 days**
  - G4

- **Shock or cardiac arrest**
  - G5

- **DVT/PE following admission evidenced by imaging &/or D Dimers**
  - G6

- **Complication of procedure or treatment**
  - G7

- **Transfer to a higher level of care:**
  1. from another hospital
  2. within this hospital
  3. to another hospital

- **Any time spent as an outlier**
  - G9

- **Lack of fluid balance chart**
  - G10

### Lab Test Module

- **Haematology**
  - **High INR >5**
    - L1
  - **Transfusion**
    - L2
  - **Abrupt drop in Hb or Hct >25%**
    - L3

- **Biochemestry**
  - **Rising urea >13 (Is this a deterioration on a previous value? Eg if normal on admission and then deteriorated)**
    - L4
  - **Rising creatinine >115**
  - **Electrolye abnormalities**
    - **Na <120 or> 160**
    - L5
  - **K < 2.5 or >6.5**
  - **Hypoglycaemia <3mmol/l**
  - **Raised Troponin >1.5ng/ml**

### Microbiology

- **MRSA bacteraemia**
  - L9
- **C. Difficile**
  - L10
- **VRE**
  - L11
- **Wound infection**
  - L12
- **Nosocomial pneumonia**
  - L13
- **Positive blood culture**
  - L14
## Patient Identifier

<table>
<thead>
<tr>
<th>TRIGGER CODE</th>
<th>TRIGGER Indicate if yes</th>
<th>EVENT Indicate if yes</th>
<th>EVENT SEVERITY (E-I)</th>
<th>EVENT DESCRIPTION/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke care module</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reported pain</td>
<td>ST1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X-ray request</td>
<td>ST2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intensive care module</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Readmission to ICU or HDU</td>
<td>I1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unplanned transfer to ICU or HDU</td>
<td>I2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medication module</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitamin K</td>
<td>M1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Naloxone (Narcan, Nalone, Narcanti)</td>
<td>M2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flumazil (fluazemil), Anexate, Mazicon, Romazicon</td>
<td>M3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glucagon or 50% glucose</td>
<td>M4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>‘Hold’ or ‘stop’ all medication order</td>
<td>M5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antibiotics</td>
<td>M6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antispasmodics: baclofen; tizanadine</td>
<td>M7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain killers: paracetamol; brufen</td>
<td>M8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**COMMENTS**

- Date admitted: [ ]
- Date discharged: [ ]
- Reason for admission: [ ]
- Date of event: [ ]

**EVENT CATEGORY**

- Category E: contributed to or resulted in temporary harm to the patient & required intervention.
- Category F: contributed to or resulted in temporary harm to patients & required initial or prolonged hospitalisation.
- Category G: contributed or resulted in permanent patient harm.
- Category H: required intervention to sustain life.
- Category I: contributed to the patient’s death.

<table>
<thead>
<tr>
<th>Total no.Triggers</th>
<th>Trigger Codes</th>
<th>Total length of Stay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total no. events</td>
<td>Event codes</td>
<td>Event category</td>
</tr>
</tbody>
</table>

*Adapted from the IHI Global Trigger Tool 2005 version by All Wales Stroke Services Improvement Collaborative (2009).*
References

Cefnogi GIG Cymru i gwyflwyno gofal iechyd o safon fyd-eang
Supporting NHS Wales to deliver world class healthcare
National Leadership and Innovation Agency for Healthcare
Asiataeth Genedlaethol Arwain ac Arloesi mewn Gofal lechyd
Gofal lechyd

NHS Wales
Cymru
Safon fyd-eang
World class healthcare
Supporting NHS Wales to deliver world class healthcare
Cefnogi GIG Cymru i gwyflwyno gofal iechyd o safon fyd-eang
National Leadership and Innovation Agency for Healthcare
Asiataeth Genedlaethol Arwain ac Arloesi mewn Gofal lechyd
Gofal lechyd