All Wales Stroke Services Improvement Collaborative

How to Guide

Improving Outcomes Following Stroke by Improving Early Rehabilitation
Improving outcomes following stroke by improving early rehabilitation

INTRODUCTION

Stroke is defined by the World Health Organization as ‘a clinical syndrome consisting of rapidly developing clinical signs of focal (or global in 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.’

“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 aging which inevitably results in death or severe disability.”

*NICE clinical guideline*

Every year in Wales an estimated 7,500 people have a first stroke with a further 3500 - 4000 estimated second strokes and TIA per year. Between 20 and 30 percent of people die within the first month of having a stroke, while a further 30 percent are left with a lifelong disability. Stroke is the third most common cause of death in the UK, and the most common cause of disability in adults.

The National Stroke Strategy states that “Rehabilitation after stroke works. Specialist co-ordinated rehabilitation, started early after stroke and provided with sufficient intensity, reduces mortality and long-term disability. Early rehabilitation is effective when provided in specialist stroke units, or as part of properly organised early supported discharge and longer-term support in the community, according to need.”

AIM OF THE GUIDANCE

The aim of this guide is to support clinicians and health care professionals make improvements in the reliability of integrated early rehabilitation for patients and carers following stroke. This follows on from the four Care Bundles already being implemented for the first week following stroke for a further six weeks and could be in a stroke unit, rehabilitation ward or in the community.

The Driver Diagrams and Care Bundles in this guide have been developed by a core group of specialist clinicians in Wales, based on the evidence and recommendations in the National Stroke Guidelines, 3rd Edition published by Royal College of Physicians (RCP) in 2008 and the National Stroke Strategy, published by the Department of Health. The Driver Diagram and Care Bundles form part of the new improvement targets, called Intelligent Targets, which will be included in the Annual Operating Framework for the new Health Boards in Wales for 2010.
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Stroke Pathway from Map of Medicine

Figure 1: Generic Stroke Pathway from Map of Medicine
Driver Diagram for Early Recovery and Rehabilitation

Weeks Two to Seven

<table>
<thead>
<tr>
<th>Content</th>
<th>Driver</th>
<th>Interventions</th>
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</thead>
</table>
| Seamless Transition of Care | • Designated case worker  
• Patient and carers involved in transfer of care  
• Handover of robust information, including:  
  o Patient Expectations  
  o Agreed goals  
  o Treatment Plan  
  o Outcome measures |
| To support individuals to achieve their optimal level of functional recovery |
| Appropriate Rehabilitation in Most Appropriate Setting | • Patients and carers involved in goal planning with communication plan in place based on communication assessment  
• Appropriate intensity of rehabilitation from multi disciplinary/professional/agency team, with relevant competencies, reviewed weekly via treatment plan  
• Weekly review of progress against goals  
• Options appraisal of rehab or discharge settings and agreed with patient/carers done  
• Weekly review of estimated discharge date (EDD) |

Measures

<table>
<thead>
<tr>
<th>Process Measures</th>
<th>Outcome Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compliance with &quot;Seamless Transfer of Care&quot; Bundle</td>
<td>Risk Adjusted Mortality</td>
</tr>
</tbody>
</table>
| Compliance with "Appropriate Rehabilitation in Most Appropriate Setting" Bundle | Average Length of Stay:  
• In Hospital  
• On Stroke Unit  
• In Stroke Service |
|                     | % Return to Usual Place of Residence |
|                     | Average Change in Functional Outcome |
|                     | % of Patients Readmitted within 28 days |

Figure 2: Driver Diagrams and Measures
Where are we?

The Royal College of Physicians (RCP) National Sentinel Audit of stroke services published in 2007\(^5\) explicitly stated that stroke services in Wales needed urgent attention. The report stated that the low numbers of patients being admitted to stroke units following a stroke were unacceptable and that a consequence of this was that more people were dying as a result of their stroke or surviving with higher levels of disability than is necessary.

In December 2007, Welsh Health Circular (2007) 082\(^6\) established a programme of work for the improvement of stroke services in Wales. A partnership between the National Public Health Service for Wales (NPHS), the National Leadership and Innovation Agency for Healthcare (NLIAH) and the Wales Centre for Health (WCfH) was tasked with addressing a number of elements of this programme. This was called the Stroke Services Improvement Programme (SSIP).

AWSSIC formed one workstream of the SSIP. It focused on acute care in the first seven days following stroke. Significant improvements in stroke care have been demonstrated across Wales, but there is still a long way to go before people can be sure that they will reliably get the care that has been shown to improve outcome following stroke.

The second year of AWSSIC is building on the achievements of the first and concentrating on early stroke rehabilitation and services for people who have a transient ischaemic attack (TIA).

The most recent National Stroke Sentinel Audit was carried out by the Royal College of Physicians in the spring of 2008. The report, published in April 2009\(^7\), reflected stroke services as they were on 1\(^{st}\) April 2008, as shown in figure 5. Data collected during the first year of the collaborative shows that all organisations have made some improvements to the standard of care over the past 18 months.
Where do we want to be?

The Royal College of Physicians published the third edition of the National Clinical Guideline for Stroke in July 2008. This incorporated the recommendations from Stroke: national clinical guideline for diagnosis and...
initial management of acute stroke and transient ischemic attack (TIA) by the National Institute for Clinical Excellence\(^1\).

The guidelines set out the interventions a patient should have to improve the outcome following stroke. Many of these recommendations are evidence based while some are based on expert opinion. Specific guidelines for stroke rehabilitation are being developed by NICE for publication in 2012.

The Welsh Health Circular (WHC) 082\(^6\) published by the Welsh Assembly Government (WAG) in December 2007 set out a programme of work for developing services for people at risk of, or have had a stroke in Wales.

This programme of work included a target for stroke rehabilitation services that the stroke partnership project should develop a national protocol and quality requirements, in line with professional body recommendations for timing and range of rehabilitation assessments and interventions that should be available on transfer from acute stroke beds to rehabilitation stroke beds where early discharge home is not appropriate by March 2009. These should then be implemented by Social Services and voluntary sector through local policy by March 2010.

More recently WAG has invited a core group of clinicians with a special interest in stroke to develop new improvement targets to be incorporated into the Annual Operating Framework for Health Boards in April 2010. The Core Group identified TIA, acute stroke and early rehabilitation as the three priority areas for these Intelligent Targets. Appendix one shows the members of this core group who were involved in setting out the key standards for early stroke rehabilitation services set out in this guide.

**How will we get there?**

**Reducing the variation in the current processes of patient care**

What does it matter if there is variation within the processes of care delivered within and between hospitals? If you, or a member of your family, have a stroke you want to know that whatever day of the week its is, time of the day, or whichever hospital you go to that the care that is provided for you is of the same high standard and quality, to ensure you get the best outcome possible.

Before we can start improving the current process of patient care, we have to have a robust understanding of what the variation in them is as a baseline.

The first year of AWSSIC focussed on the first seven days following stroke, and highlighted the difficulties in collecting data on every stroke patient that was admitted to hospital. The majority of teams involved were able to
develop systems to facilitate this and found analysing the data they had collected invaluable in identifying which parts of the care processes were not being delivered consistently, and also to evaluate the changes and service improvements they instigated.

The exercise of collecting the data also facilitated a better communication and understanding of all the roles and responsibilities of the members of the teams involved.

**Using a “Care Bundle” approach to improve the reliability of patient care**

A “Care Bundle” is a term or concept developed by the Institute for Healthcare Improvement (IHI) as a way to describe a collection of processes needed to effectively care for patients undergoing particular treatments with inherent risks. The idea is to bundle together several scientifically grounded elements essential to improving clinical outcomes. A bundle should be relatively small and straightforward – a set of three to five practices or precautionary steps is ideal.

The power of a Bundle comes from the body of science behind it and the method of execution: with complete consistency. The interventions in a bundle are well established best practices, but they are often not performed uniformly making treatment unreliable. A Bundle ties the interventions together into a package 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. The whole team becomes accountable for delivering all the interventions, not just their profession specific one.

A Bundle is not just a list of absolutes or precise protocols. It is a set of steps that experts believe are critical, but in many cases the clinical values attached to each step are locally defined or may change over time based on evolving research and the experiences of users.

Implementing care bundles in the AWSSIC has encouraged teams to reconsider their professional roles within teams and has encouraged the development of interdisciplinary teams and also facilitated training and set competencies required to carry out specific tasks.

The utility of the Care Bundle Approach is the timely measurement that clinical guidelines are being followed and to influence changes in clinical practice accordingly. While similar to the audit cycle, the difference is the speed with which feedback takes place. In an audit data is analysed retrospectively, while a care bundle is monitored prospectively.

Hospital clinical audit/effectiveness departments may have a role to play if they can facilitate the rapid feedback of data, however the best results have been obtained where measurement has been incorporated into daily routine.
A Collaborative Approach for Wales

AWSSIC is based on the IHI Breakthrough Series Model\(^8\), as shown in figure 4. 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.

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 Collaborative will enable teams to share learning across Wales, accelerating improvement through the local adaptation of models that have been shown to be successful elsewhere.

![Figure 4: IHI Breakthrough Series Model\(^8\)](image)

**Framework and Changes**

The Driver Diagrams and Care Bundles form the framework for this Collaborative. The aim of the Collaborative is to support teams and organisations to make the changes needed to implement these Care Bundles locally.

**Learning Sessions**

There will be three learning sessions (LS) during the Collaborative. The launch event in October 2009, then a follow up session in February 2010, and a final learning session in July 2010.
Action Periods

In the first Action Period teams are encouraged to concentrate on data collection, with tests of change and Plan-Do-Study-Act (PDSA) cycles being introduced once a baseline had been established.

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

The teams will be supported during the Action Periods with site visits from the programme manager, monthly telephone conferences and three national meetings of project leads. Some of the project leads meetings will include skills sessions.

All the presentations for the learning sessions will be available on the intranet site, hosted by the NPHS at www.wales.nhs.uk.

The site also has resources that have already been developed and it can be used by teams for posting any additional resources which teams develop and are happy to share, such as documentation, protocols, guidance and teaching resources.

Model for Improvement

The Institute of Healthcare Improvement’s (IHI) Model for Improvement is a simple tool for accelerating improvement. It has been used very successfully by hundreds of health care organizations in many countries to improve many different health care processes and outcomes. Its use has been promoted in the first year of the AWSSIC and also in the 1000 Lives Campaign.

The model has two parts:

1. Three fundamental questions
   a. What are we trying to accomplish?
   b. How will we know if a change is an improvement?
   c. What change will result in improvement?

2. The Plan-Do-Study-Act (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
Measurement

Measurement is the only way to know whether a change represents an improvement. Teams will be required to collect a minimum dataset on every patient who is referred with a TIA. This dataset is outlined in Appendix 3.

Each team or organisation will need to develop a method of collecting the data that suits their own service model. A data collection planner is included in Appendix 2.

Tracking Measures over Time

Improvement takes place over time. Determining if improvement has really occurred and if it is a lasting effect requires observing patterns over time. Run charts are graphs of data over time and are one of the single most important tools in performance improvement. Using run charts has a variety of benefits:

- They help teams formulate aims by depicting how well (or poorly) a process is performing
- They help in determining when changes are truly improvements by displaying a pattern of data that you can observe as you make changes
- They give direction as you work on improvement and information about the value of particular changes

Each team will be given a data collection tool into which they can input their data. The tool will automatically produce run charts on a weekly or monthly basis, enabling the teams to track their compliance rates and
interventions rates over time. Teams will need to devise a way to review
the data they collect and share it with managers and executives to ensure
that it informs robust service planning.

**Making changes**

Having data on every patient and being able to monitor it on a weekly or
monthly basis will enable teams to make small tests of change using the
PDSA cycle. Only those changes that show an improvement in patient care
need to be taken forward, minimising the need for disruptive organisational
changes that do not have an impact on patient care or efficiency of
services.

**First test of change**

Once a team has prepared the way for change by studying the current
process and educated the involved parties, the next step is to begin testing
the intervention.

- Start small- with one patient, one meeting or on one ward
- Work with everyone involved with the change to make sure they
  understand and are able to make the change
- If successful, make sure that the change can be achieved at a wider
  level, for example on a different ward
- Process feedback and incorporate suggestions for improvements
- Try the change on a bigger scale

**Getting Started- keys to success**

Teams cannot implement these bundles overnight. A successful program
involves careful planning, testing to determine if any changes result in an
improvement, making modifications, re-testing and careful implementation.
There are a number of considerations you should make before you start:

**Getting leadership support**

Changing practice requires a change in organisational culture and attitudes.
The organisational culture within an individual organisation, hospital,
department or patient care unit, develops based on the overt and subtle
messages employees receive. Leadership actions strongly influence
employee beliefs as to what leaders consider important, even more so than
what is actually said.

Engage senior leadership support and buy in from both executives and
physicians. There needs to be a united message “We are going to do this;
this is important and the right thing to do for our patients”.
Forming a team

Teamwork is essential in healthcare today, and communication within the team is indicative of the organisational culture. Everyone must be considered as an equally important member of the team, regardless of their role, and not only encouraged to speak up, but required to do so.

Teams should be multidisciplinary and involve all stakeholders involved in the patient journey. Different professions will have different approaches; however the whole team should have the same aim in mind. The value in bringing diverse personnel together is that all members of the team are given a stake in the outcome and work to achieve the same goal.

Some of the ways to attract and retain team members are:

• Use data to find and solve the problems
• Find a champion within the hospital who is sufficiently high profile and visibility to lend the effort immediate credibility
• Work with those who want to work on the project rather that trying to convince those who do not

Project Lead

Each team needs someone who is going to co-ordinate the teams work. Feedback for the project leads for the first year of AWSSIC identified some of the roles and responsibilities of the project lead as;

• Communication within and without the team
• Engaging and motivating local teams
• Co-ordinating meetings, data collection and PDSAs
• Organising and attending meetings

An effective project lead is critical to the success of the local team.

Communication

Communicate, communicate, communicate- you cannot do enough of this. Particularly at the beginning, get the word out often. Be systematic and relentless in your communication. Tell people what you are doing and why, and get people’s ideas on what might make your processes of care more effective. Use the data you collect to motivate staff involved in stroke rehabilitation services and report your data to directorate and executive teams.

Think about education and share success stories widely for example with primary care, in outpatient clinics, with staff in the radiology departments and of course with those people using your services. This will help maintain the momentum, motivation and enthusiasm in everyone involved to continue making improvements in the quality and effectiveness of services provided.
Care Bundles

Seamless Transition of Care

Elements and Recommendations

Designated case worker, this could be a doctor, nurse or therapist, depending on the main impairments or activity limitation of the patient

- People who have had a stroke and their carers value continuity, being kept informed, being included and having a clear, consistent point of contact with services. (NSS 3.4)

Patients and their carers are including in planning for the transfer of care

- Patients should be:
  - involved in making decisions about transfer
  - offered copies of transfer documents (RCP 3.6.1.C)
- Hospital services should have a locally negotiated protocol to ensure that before discharge occurs:
  - patients and families are fully prepared, and have been fully involved in planning discharge
  - patients and families are given information about and offered contact with appropriate statutory and voluntary agencies (RCP 3.7.1 A)
- When a therapist or team stops giving rehabilitation, the therapist or service should (RCP 6.2.1 C):
  - discuss the reasons for this decision with the patient
  - ensure that any continuing support that the patient needs to maintain and/or improve health is provided
  - teach the patient and, if necessary, carers and family how to maintain health
  - provide clear instructions on how to contact the service for reassessment
  - outline what specific events or changes should trigger further contact.
- There should be a workable, clear discharge plan that has fully involved the individual (and their family where appropriate) and responded to the individual’s particular circumstances and aspirations is developed by health and social care services (NSS QM 12)

Handover of robust information including: patients’ expectations, goals that have been agreed with the patient, treatment plan and outcome measures

- All transfers between different teams and between different organisations should:
  - occur at the appropriate time, without delay
  - not require the patient to provide again complex information already given
  - ensure that all relevant information is transferred, especially concerning medication
  - maintain a common set of patient-centred goals (RCP 3.6.1 A)
  - All organisations and teams regularly involved in seeing patients after stroke should use:
    - a common, agreed set of data collection tools (measures and assessments)
    - a common, agreed terminology
    - a common, agreed document layout (structure) and content (RCP 3.6.1 B)
• Any continuing specialist treatment required will be provided without delay by an appropriate specialist service

• Patients should only be discharged early (before the end of acute rehabilitation) from hospital if there is a specialist stroke rehabilitation team able to continue rehabilitation in the community from the day of transfer and if the patient is able to transfer safely from bed to chair, and if other problems can be safely managed at home (RCP 3.7.1 B)

• Patients being discharged who remain dependent in some personal activities (eg dressing, toileting) should be offered a transition package of:
  o pre-discharge visits (eg at weekends)
  o individual training and education for their carers/family
  o telephone counselling support for three months (3.7.1 C)

• Before discharge of a patient who remains dependent in some activities, the patient’s home environment should be assessed and optimised, usually by a home visit by an occupational therapist (RCP3.7.1 D)

• Patients should not be discharged early from hospital to generic (non-specialist) community services (including both home, and community hospitals) unless there is continuing active involvement by the specialist stroke service (3.7.1 E)

• Carers of patients unable to transfer independently should receive training in moving and handling and the use of any equipment provided until they are demonstrably able to transfer and position the patient safely in the home environment (3.7.1.F)

• All patients should continue to have access to specialist stroke services after leaving hospital, and should know how to make contact (RCP 3.7.1 G)

Actions Required

• Agreeing and documented designated case worker for every patient who has clear responsibility for discussing all aspects of the patient’s care with the patient and their family

• Develop a local system for ensuring that patient and carers are included in planning for the transfer of care

• Develop local guidelines and documentation for handover including assessment tools and outcome measures that can be used across care settings (example in appendix 4)

Measures

• Compliance rate for bundle- percentage of transfers that have all the interventions in the bundle

• Percentage of patients who have a designated case worker

• Percentage of patients and their carers who are involved with the planning of their transfer of care

• Percentage of patients who have robust transfer documentation

Data Collection

• Designated case worker Yes/No

• Documented evidence of patient and/or carer involved in transfer of care Yes/No

• Transfer documentation which complies with local protocol/policy Yes/No
Appropriate Rehabilitation in Most Appropriate Setting

Elements and evidence-based recommendations

Patients and carers involved in goal planning with communication plan in place based on communication assessment

- Every patient involved in the rehabilitation process should (RCP 3.11.1):
  o have their wishes and expectations established and acknowledged
  o participate in the process of setting goals unless they choose not to or are unable to participate because of the severity of their cognitive and linguistic impairments
  o be given help to understand the nature and process of goal setting, and be given help (e.g., using established tools) to define and articulate their personal goals
  o have goals that:
    o are meaningful and relevant to the patient
    o are challenging but achievable
    o include both short-term (days/weeks) and long-term (weeks/months) targets
    o include both single clinicians and also the whole team
    o are documented, with specified, time-bound measurable outcomes
    o have achievement evaluated using goal attainment
    o include family members where appropriate
  o are used to guide and inform therapy and treatment.

- Patients should always be informed of realistic prospects of recovery or success and should always have realistic goals set (RCP 6.1.1 B)

- The nature and consequences of a patient’s impairments should always be explained to the patient (and to the family), and if necessary and possible they should be taught strategies or offered treatments to overcome or compensate for any impairment affecting activities or safety, or causing distress (RCP 6.1.1 E)

- Those who have had a stroke may have additional communication or cognitive support needs to be able to participate in the assessment (NSS 3.40)

Appropriate intensity of rehabilitation from multidisciplinary/professional/agency team, with relevant competencies, reviewed weekly via treatment plan

- All patients entering a period of active rehabilitation should be screened for common impairments using locally agreed tools and protocols (RCP 6.1.1 A)

- Specific treatments should only be undertaken in the context of and after considering the overall goals of rehabilitation and potential interaction with other treatments (6.1.1 C)

- For any treatments that involve significant risk/discomfort to the patient and/or resource use, specific goals should be set and monitored using appropriate clinical measures such as numerical rating scales, visual analogue scales, goal attainment rating or a standardised measure appropriate for the impairment (RCP 6.1.1 D)

- All members of a stroke service should (RCP 3.12.1):
  o use an agreed consistent approach for each problem faced by a patient, ensuring the patient is given the same advice and taught the same technique to ameliorate or overcome it
  o give as much opportunity as possible for a patient to practise repeatedly and in different settings any tasks or activities that are affected
  o work within their own knowledge, skills, competence and limits in handling patients and using equipment, being taught safe and appropriate ways to move and handle specific patients if necessary
• Patients should undergo as much therapy appropriate to their needs as they are willing and able to tolerate and in the early stages they should receive a minimum of 45 minutes daily of each therapy that is required (RCP 3.13.1 A)

• The team should promote the practice of skills gained in therapy into the patient’s daily routine in a consistent manner and patients should be enabled and encouraged to practise that activity as much as possible (RCP 3.13.1 B)

• Therapy assistants may facilitate practice but should work under the guidance of a qualified therapist (RCP 3.13.1 C)

**Weekly review of progress against goals**

• Patients should always be informed of realistic prospects of recovery or success and should always have realistic goals set (6.1.1 B)

• Every patient should have their progress measured against goals set at regular intervals determined by the patient’s rate of change, for example using goal attainment scaling (RCP 6.2.1 A)

• When a patient’s goal is not achieved, the reason(s) should be established and:
  - the goal should be adjusted, or
  - the intervention should be adjusted, or
  - no further intervention should be given towards that goal (RCP 6.2.1 B)

• A stroke rehabilitation service should (RCP 3.10.1):
  - agree on standard sets of data that should be collected and recorded routinely use data collection tools that fulfil the following criteria as much as possible
  - collect relevant data covering the required range (ie are valid and fulfil a need)
  - have sufficient sensitivity to detect change expected in one patient or difference expected between groups of patients
  - are of known repeatability when used by different people on different occasions
  - are simple to use under a variety of circumstances
  - have easily understood scores
  - have protocols determining the routine collection and use of data in their service
  - determining reason for and proposed use of each item
  - allowing individual clinicians choice from two or three tools where no measure is obviously superior
  - reviewing the utility of each item regularly
  - train all staff in the recognition and management of emotional, communicative and cognitive problems
  - have protocols to guide the use of more complex assessment tools, describing:
    - when it is appropriate or necessary to consider their use
    - what tool or tools should be used
    - what specific training or experience is needed to use the tool(s)
    - measure change in function at appropriate intervals

**Options appraisal of rehab or discharge settings and agreed with patient/carers done**

• Patients should always be informed of realistic prospects of recovery or success and should always have realistic goals set (6.1.1 B)

• Specialist teams may be more important in the early stages of rehabilitation, while generic teams can be appropriate for the later stages. However, the configuration of community teams is less important than ensuring that these teams are multidisciplinary and all staff have the right specialist skills to help rehabilitate people who have had a stroke. (NSS 3.14)

• Patients should only be discharged early (before the end of acute rehabilitation) from hospital if there is a specialist stroke rehabilitation team able to continue rehabilitation in the community from the day of transfer and if the patient is able
to transfer safely from bed to chair, and if other problems can be safely managed at home (3.7.1 B)

• Patients should not be discharged early from hospital to generic (non-specialist) community services (including both home, and community hospitals) unless there is continuing active involvement by the specialist stroke service (3.7.1 E)

**Weekly review of estimated discharge date (EDD)**

• When a therapist or team stops giving rehabilitation, the therapist or service should (RCP 6.2.1 C):
  o discuss the reasons for this decision with the patient
  o ensure that any continuing support that the patient needs to maintain and/or improve health is provided
  o teach the patient and, if necessary, carers and family how to maintain health
  o provide clear instructions on how to contact the service for reassessment
  o outline what specific events or changes should trigger further contact

**Actions Required**

• Local protocol in place on screening for communication impairments and assessment tools agreed
• Local protocol in place for screening or all impairments (appendix 5)
• Local documentation for communication plan accessible to patient, carers and all members of the team
• Local policy/protocol in place for weekly MDT meetings (example included in appendix 6) including:
  o Which professions/teams should be included/represented
  o Roles and responsibilities of people attending
  o When and where the meeting takes place
  o Arrangements for information need for goal setting and treatment planning in place for those that cannot attend
  o Which assessment tools should be used by which professions
• Education and training available for goal setting (crib sheet included in appendix 7)
• Develop data collection tool to suit local model of care (planning tool and example included in appendices 2 and 3 and also on www.stroke.wales.nhs.uk intranet site)

**Measures**

• compliance with bundle- percentage of people who had all the interventions in the bundle
• the percentage of people who had documented evidence that they had been involved with goal planning
• the percentage of people who had a communication plan in place
• the percentage of people who received the agreed intensity of therapy
• the percentage of people who had their goals reviewed weekly
• the percentage of people who had had their options for rehab settings or discharge discussed with them and documented
• the percentage of people who had their estimated discharge date reviewed weekly
Data Collection

- communication plan, based on communication assessment, in place Yes/No
- documented evidence that patient and/or carers involved in goal planning Yes/No
- documented goals reviewed weekly Yes/No
- documented treatment plan reviewed weekly Yes/No
- number of sessions planned per week Number
- number of sessions delivered per week Number
- options for rehabilitation documented Yes/No
- estimated discharge date reviewed Yes/No
References


Appendix One: Membership of Core Group involved in developing Driver Diagram and Care Bundles

<table>
<thead>
<tr>
<th>Name</th>
<th>Role / Profession</th>
<th>Organisation</th>
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<tbody>
<tr>
<td>Alan Willson</td>
<td>Director of R&amp;D</td>
<td>NLIAH</td>
</tr>
<tr>
<td>Alun Morgan</td>
<td>Physiotherapist</td>
<td>Cardiff and Vale NHS Trust</td>
</tr>
<tr>
<td>Andy Williams</td>
<td>Paramedic</td>
<td>WAST</td>
</tr>
<tr>
<td>Breeda Worthington</td>
<td>Facilitator</td>
<td>NLIAH</td>
</tr>
<tr>
<td>Carl James</td>
<td>PMWTEC</td>
<td>WAG</td>
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<tr>
<td>Carol Milton</td>
<td>Dietician</td>
<td>ABMU NHS Trust</td>
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<td>Carole Saunders</td>
<td>Nurse</td>
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<tr>
<td>Caroline Millichip</td>
<td>OT</td>
<td>Cardiff and Vale NHS Trust</td>
</tr>
<tr>
<td>Cathy White</td>
<td>DHSS - CPCHSD</td>
<td>WAG</td>
</tr>
<tr>
<td>Conrad Hancock</td>
<td>Primary Care</td>
<td>Blaenau Gwent LHB</td>
</tr>
<tr>
<td>Dr Anne Freeman</td>
<td>Chair WSA, Physician</td>
<td>Gwent Healthcare Trust</td>
</tr>
<tr>
<td>Dr Chris Burton</td>
<td>Education</td>
<td>Bangor University</td>
</tr>
<tr>
<td>Dr Dick Dewar</td>
<td>Medicine</td>
<td>Cwm Taf NHS Trust</td>
</tr>
<tr>
<td>Dr Ed Wilkins</td>
<td>Chair WMC, Physician</td>
<td>ABMU NHS Trust</td>
</tr>
<tr>
<td>Dr Hamsaraj Shetty</td>
<td>Physician</td>
<td>Cardiff and Vale NHS Trust</td>
</tr>
<tr>
<td>Dr Mark Vaughan</td>
<td>GP</td>
<td>Llanelli</td>
</tr>
<tr>
<td>Dr Salah Elghanzai</td>
<td>Physician</td>
<td>North West Wales NHS Trust</td>
</tr>
<tr>
<td>Dr Vijay Sawlani</td>
<td>Neuroradiologist</td>
<td>Morriston Hospital, ABMU</td>
</tr>
<tr>
<td>Gwyn Roberts</td>
<td>PMWTEC</td>
<td>WAG</td>
</tr>
<tr>
<td>Heather Giles</td>
<td>PMWTEC</td>
<td>WAG</td>
</tr>
<tr>
<td>Heather Graz</td>
<td>SALT</td>
<td>Gwent Healthcare Trust</td>
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<tr>
<td>Janet Ivey</td>
<td>OT</td>
<td>Cwm Taf NHS Trust</td>
</tr>
<tr>
<td>Joanne Dundon</td>
<td>IHI</td>
<td>Informing Healthcare</td>
</tr>
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<td>Julie Wilcox</td>
<td>Neuropsychologist</td>
<td>Cardiff and Vale NHS Trust</td>
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<tr>
<td>Linda Passey</td>
<td>Orthoptist</td>
<td>Gwent Healthcare Trust</td>
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<td>Lynne Hughes</td>
<td>Nurse</td>
<td>North Wales NHS Trust</td>
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<tr>
<td>Michelle Graham</td>
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<td>NLIAH</td>
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<tr>
<td>Michelle Price</td>
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<td>NLIAH</td>
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<td>Nichola Pryce-Howard</td>
<td>WAG</td>
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<tr>
<td>Nicola Davis</td>
<td>Nurse</td>
<td>Blaenau Gwent LHB</td>
</tr>
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<td>Susan Wilson</td>
<td>Physiotherapist</td>
<td>ABMU NHS Trust</td>
</tr>
<tr>
<td>Suzanne Martin</td>
<td>Orthoptist</td>
<td>ABMU NHS Trust</td>
</tr>
</tbody>
</table>
Appendix Two: Example of bundle data collection sheet from Wrexham Maelor Hospital

**STROKE REHABILITATION BUNDLE- APPROPRIATE TREATMENT IN MOST APPROPRIATE SETTING**

<table>
<thead>
<tr>
<th>Patient ID Label:</th>
<th>Rehabilitation Setting:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Week 1</td>
</tr>
<tr>
<td></td>
<td>/09</td>
</tr>
</tbody>
</table>

- Communication assessment completed and documented
- Communication plan in place
- Multidisciplinary Goals agreed and documented
- Documented evidence of patient and carer involvement in goal planning
- Number of treatment sessions planned documented for week
- Number of treatment sessions delivered documented
- Weekly review of progress
- Options for rehab discussed with patient/carer documented
- EDD review
## Appendix Three: Data Collection Planner

<table>
<thead>
<tr>
<th>Phase</th>
<th>Data item</th>
<th>Format</th>
<th>Who records this</th>
<th>At what point</th>
<th>Where is it stored</th>
<th>How reliably do we collect</th>
<th>Issues to resolve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfer of Care</td>
<td>Designated case worker</td>
<td>Yes/No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Documented evidence of patient and/or carer involved in transfer of care</td>
<td>Yes/No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transfer documentation which complies with local protocol/policy</td>
<td>Yes/No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appropriate Rehabilitation in Most Appropriate Setting</td>
<td>Communication plan, based on communication assessment, in place</td>
<td>Yes/ No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Documented evidence that patient and/or carers involved in goal planning</td>
<td>Yes/No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Documented goals reviewed weekly</td>
<td>Yes/No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Documented treatment plan reviewed weekly</td>
<td>Yes/No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of sessions planned per week</td>
<td>Number</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of sessions delivered per week</td>
<td>Number</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Options for rehabilitation documented</td>
<td>Yes/No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix Four: Example of transfer of care document

<table>
<thead>
<tr>
<th>XXXX Stroke Unit</th>
<th>PLEASE AFFIX ADDRESSOGRAPH LABEL</th>
</tr>
</thead>
</table>

Home Situation

Goals agreed with patient

Therapies Undertaken and contact details:
- Dietetics
- OT
- Physio
- Psychology
- SALT

Functional Outcome Measure Score on Discharge:

<table>
<thead>
<tr>
<th>Communication</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Eating and Drinking</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Medications Management</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Elimination</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Mobility</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Personal Care</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Domestic ADL</th>
<th>Cooking</th>
<th>Cleaning</th>
<th>Shopping</th>
<th>Laundry</th>
<th>Package of Care</th>
</tr>
</thead>
</table>

Cognitive/Perceptual Issues:
## Work/Leisure/Driving Recommendations:

### Other Outcome Measures

<table>
<thead>
<tr>
<th>On admission</th>
<th>On Discharge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

### Equipment Supplied/Environmental Adaptations

**Health**

**Local Authority**

### Additional Comments:

### Referral onto Other Services:

### Review Plan:

### Ongoing Goals:

### Case Worker | Contact details | Date
### Appendix Five: WHO International Classification of Functioning (WHO-ICF) common problems associated with stroke

#### Impairments
- Anxiety
- Aphagia
- Aphasia
- Ataxia
- Cardiovascular fitness
- Bowel Function
- Cognitive Impairment
- Contractures
- Depression
- Dysarthria
- Dysphagia
- Emotionalism (tearfulness)
- Executive Function
- Fatigue
- Hearing
- Inattention
- Malnutrition
- Mood disturbance
- Motor Control
- Muscle weakness
- Neglect (spatial awareness)
- Oral hygiene
- Pain
- Perceptual problems
- Sensory disturbance
- Shoulder subluxation
- Sexual function
- Spasticity
- Swelling/oedema
- Tone disturbance
- Urinary Incontinence
- Visual disturbance
- Volition

#### Limitations in Activity
- Ability to protect airway
- Ability to maintain oral health and hygiene
- Ability to maintain adequate hydration
- Ability to maintain adequate nutrition
- Ability to maintain skin integrity
- Ability to manage elimination
- Ability to communication effectively
- Personal activities of daily living
- Extended activities of daily living
- Posture- ability to gain/maintain, seating
- Bed Mobility
- Transfers
- Walking/ Gait
- Wheelchair mobility
- Ability to self medicate effectively

#### Limitations in Participation
- Driving
- Education
- Employment
- Financial
- Family Role
- Home environment
- Work environment
- Leisure
- Social Role
- Productivity
Appendix Six: Example of a local MDT agreement

XXX Stroke Team

Name of Organisation:

Name of Unit:

No of stroke rehab beds:

Lead Physician:

Ward Manager:

Clinical Nurse Specialist:

Therapies

<table>
<thead>
<tr>
<th>Profession</th>
<th>Lead name</th>
<th>Contact no</th>
<th>Times on ward</th>
<th>No. qualified staff</th>
<th>No. support staff</th>
<th>Input to MDTs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dietetics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nursing</td>
<td></td>
<td></td>
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<tr>
<td>OT</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Orthoptics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pharmacy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physiotherapy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Podiatry</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychology</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SALT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

MDT Meeting:

Date:
Time:
Venue:

Goal Setting Meetings:

Date:
Time:

MDT Functional Outcome Measures:
**Profession specific assessments and outcome measures:**

<table>
<thead>
<tr>
<th>Profession</th>
<th>With basic training</th>
<th>With specialised training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dietetics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nursing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OT</td>
<td></td>
<td></td>
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<tr>
<td>Orthoptics</td>
<td></td>
<td></td>
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<tr>
<td>Pharmacy</td>
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<tr>
<td>Physiotherapy</td>
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<td></td>
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<tr>
<td>Podiatry</td>
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<td></td>
</tr>
<tr>
<td>Psychology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SALT</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Appendix Seven: Examples of Goal Setting Crib Sheet

<table>
<thead>
<tr>
<th>Self Efficacy</th>
<th>Oral health &amp; hygiene/ Dentition</th>
<th>Swallow</th>
</tr>
</thead>
<tbody>
<tr>
<td>To be able to motivate self to attend therapy sessions independently</td>
<td>To be able to maintain oral health and hygiene with help from staff</td>
<td>To be able to swallow .. teaspoons of water effectively and safely</td>
</tr>
<tr>
<td>To be able to initiate......</td>
<td>To be able to maintain oral health and hygiene independently</td>
<td>To be able to manage … teaspoonfuls of a pureed diet three times a day</td>
</tr>
<tr>
<td>To be involved in setting own goals</td>
<td>To be able to manage own oral secretions</td>
<td>To be able to eat three unmodified meals a day</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Elimination</th>
<th>Skin Integrity</th>
<th>Positioning</th>
</tr>
</thead>
<tbody>
<tr>
<td>To be able to ask for help with toileting</td>
<td>To understand need for regular repositioning to prevent pressure areas</td>
<td>To understand the need to wear a splint/positioning aid for ...hours</td>
</tr>
<tr>
<td>To maintain bowel management with dietary supplements</td>
<td>To be able to move in bed to relieve pressure</td>
<td>To remind staff to put on splint/positioning aid</td>
</tr>
<tr>
<td>To maintain bladder management with prompts</td>
<td></td>
<td>To be able to reposition self to reposition self in chair once prompted</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Medication management</th>
<th>Nutrition and Hydration</th>
<th>Mobility - transfers/gait/wheelchair</th>
</tr>
</thead>
<tbody>
<tr>
<td>To be able to manage own medication with prompts</td>
<td>To be able to maintain adequate nutrition to enable rehabilitation by</td>
<td>To be able to roll in bed with minimal assistance when being washed</td>
</tr>
<tr>
<td>To be able to manage own medication without prompts</td>
<td>• taking dietary supplements</td>
<td>To be able to roll in bed with prompts when being washed</td>
</tr>
<tr>
<td></td>
<td>• eating three meals a day</td>
<td>To be able to move up and down the bed independently</td>
</tr>
<tr>
<td></td>
<td>To be able to tolerate an NG/PEG feeding regime of ...ml/hr</td>
<td>To be able to tolerate standing on tilt table at 80° for ... minutes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pain management</th>
<th>Spasticity management</th>
<th>Personal ADL</th>
</tr>
</thead>
<tbody>
<tr>
<td>To be able to tell staff when in pain</td>
<td>To be able to understand the need to take medication to manage spasticity</td>
<td>To be able to feed self using adapted cutlery and using affected hand to stabilise plate</td>
</tr>
<tr>
<td></td>
<td>To be able to put on splint to manage spasticity</td>
<td>To be able to wash face with set up and prompts, using unaffected hand</td>
</tr>
<tr>
<td></td>
<td>To be able to carry out stretches to reduce spasticity independently</td>
<td>To be able to wash upper half of body independently using both hands</td>
</tr>
<tr>
<td></td>
<td></td>
<td>To be able to take wash things to bathroom and shower and dress independently</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Elimination</th>
<th>Skin Integrity</th>
<th>Positioning</th>
</tr>
</thead>
<tbody>
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<td>To understand the need to wear a splint/positioning aid for ...hours</td>
</tr>
<tr>
<td>To maintain bowel management with dietary supplements</td>
<td>To be able to move in bed to relieve pressure</td>
<td>To remind staff to put on splint/positioning aid</td>
</tr>
<tr>
<td>To maintain bladder management with prompts</td>
<td></td>
<td>To be able to reposition self to reposition self in chair once prompted</td>
</tr>
<tr>
<td></td>
<td></td>
<td>To be able to maintain an upright symmetrical posture in armchair for ....minutes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Medication management</th>
<th>Nutrition and Hydration</th>
<th>Mobility - transfers/gait/wheelchair</th>
</tr>
</thead>
<tbody>
<tr>
<td>To be able to manage own medication with prompts</td>
<td>To be able to maintain adequate nutrition to enable rehabilitation by</td>
<td>To be able to roll in bed with minimal assistance when being washed</td>
</tr>
<tr>
<td>To be able to manage own medication without prompts</td>
<td>• taking dietary supplements</td>
<td>To be able to roll in bed with prompts when being washed</td>
</tr>
<tr>
<td></td>
<td>• eating three meals a day</td>
<td>To be able to move up and down the bed independently</td>
</tr>
<tr>
<td></td>
<td>To be able to tolerate an NG/PEG feeding regime of ...ml/hr</td>
<td>To be able to tolerate standing on tilt table at 80° for ... minutes</td>
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</tbody>
</table>

<table>
<thead>
<tr>
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<th>Spasticity management</th>
<th>Personal ADL</th>
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</thead>
<tbody>
<tr>
<td>To be able to tell staff when in pain</td>
<td>To be able to understand the need to take medication to manage spasticity</td>
<td>To be able to feed self using adapted cutlery and using affected hand to stabilise plate</td>
</tr>
<tr>
<td></td>
<td>To be able to put on splint to manage spasticity</td>
<td>To be able to wash face with set up and prompts, using unaffected hand</td>
</tr>
<tr>
<td></td>
<td>To be able to carry out stretches to reduce spasticity independently</td>
<td>To be able to wash upper half of body independently using both hands</td>
</tr>
<tr>
<td></td>
<td></td>
<td>To be able to take wash things to bathroom and shower and dress independently</td>
</tr>
<tr>
<td>Domestic ADL</td>
<td>Communication</td>
<td>Vision/Perception</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------</td>
<td>----------------------------------------------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>To be able to make a sandwich using both hands with set up and prompts</td>
<td>To be able to communicate needs and wishes using a communication aid</td>
<td></td>
</tr>
<tr>
<td>To be able to make self a cup of tea in kitchen using a perching stool and trolley</td>
<td>To be able to express abstract ideas verbally</td>
<td></td>
</tr>
<tr>
<td>Psychological needs – mood / anxiety / emotional state</td>
<td></td>
<td>Cognition – verbal reasoning / insight / executive function / decision making / mental capacity / problem solving / attention</td>
</tr>
</tbody>
</table>
Appendix 8: Worksheet for Testing Change- PDSA Cycle

Aim: (overall goal you would like to reach)

Every goal will require multiple small tests of change

Describe your first (or next) test of change

<table>
<thead>
<tr>
<th>Person Responsible</th>
<th>When to be done</th>
<th>Where to be done</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

List the task needed to set up this test of change

<table>
<thead>
<tr>
<th>Person Responsible</th>
<th>When to be done</th>
<th>Where to be done</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. 2. 3. 4. 5. 6.

Predict what will happen when the next test is carried out

<table>
<thead>
<tr>
<th>Measures to determine if predictions accurate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 2. 3.</td>
</tr>
</tbody>
</table>

Do Describe what actually happened when you ran the test
**Study** Describe the measured results and how they compared to the predictions

**Act** Describe what modifications to the plan will be made for the next cycle