Acknowledgements

This guide has been produced by Michelle Price, Alan Willson, Anne Freeman and Michelle Graham.

We would particularly like to thank healthcare organisations in Wales and their teams for their work in implementing these interventions and also feeding back lessons and experiences gained as a result.

1000 Lives Plus is run as a collaborative, involving the National Leadership and Innovation Agency for Healthcare, National Patient Safety Agency, Public Health Wales and the Clinical Governance Support and Development Unit.

We wish to thank and acknowledge the Institute for Healthcare Improvement (IHI) and The Health Foundation for their support and contribution to 1000 Lives Plus.

Date of publication and proposed review date

This guide was published in April 2010 and will be reviewed in April 2011. The latest version will always be available online on the programme’s website: www.1000livesplus.wales.nhs.uk

Purpose of this guide

This guide has been produced to enable healthcare organisations and their teams to successfully implement a series of interventions to improve the safety and quality of care that their patients receive.

This guide must be read in conjunction with the following:

- Leading the Way to Safety and Quality Improvement
- How to Improve

Further guides are also available to support you in your improvement work:

- How to Use the Extranet
- A Guide to Measuring Mortality
- Improving Clinical Communication Using SBAR
- Learning to Use Patient Stories
- Using Trigger Tools
- Reducing Patient Identification Errors

These are available from the 1000 Lives Plus office, or online at www.1000livesplus.wales.nhs.uk

We are grateful to The Health Foundation for their support in the production of this guide.
Improving care, delivering quality

The 1000 Lives Campaign has shown what is possible when we are united in the pursuit of a single aim: the avoidance of unnecessary harm for the patients we serve. The enthusiasm, energy and commitment of teams to improve patient safety by following a systematic, evidence-based approach has resulted in many examples of demonstrable safety improvement.

However, as we move forward with 1000 Lives Plus, we know that harm and error continue to be a fact of life and that this applies to health systems across the world. We know that much of this harm is avoidable and that we can make changes that reduce the risk of harm occurring. Safety problems can’t be solved by using the same kind of thinking that created them in the first place. To make the changes we need, we must build on our learning and make the following commitments:

- Acknowledge the scope of the problem and make a clear commitment to change systems.
- Recognise that most harm is caused by bad systems and not bad people.
- Acknowledge that improving patient safety requires everyone on the care team to work in partnership with one another and with patients and families.

The national vision for NHS Wales is to create a world class health service by 2015: one which minimises avoidable death, pain, delays, helplessness and waste. This guide will help you to take a systematic approach and implement practical interventions that can bring that about. The guide is grounded in practical experience and builds on learning from organisations across Wales during the 1000 Lives Campaign and also on the experience of other campaigns and improvement work supported by the Institute for Healthcare Improvement (IHI).
## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>5</td>
</tr>
<tr>
<td>Driver Diagram</td>
<td>7</td>
</tr>
<tr>
<td>Getting Started</td>
<td>8</td>
</tr>
<tr>
<td>Drivers and Interventions</td>
<td>9</td>
</tr>
<tr>
<td>Helpful resources</td>
<td>22</td>
</tr>
<tr>
<td><strong>Appendices</strong></td>
<td></td>
</tr>
<tr>
<td>Measures and Definitions</td>
<td>32</td>
</tr>
<tr>
<td>Setting up your team</td>
<td>35</td>
</tr>
<tr>
<td>The Model for Improvement</td>
<td>37</td>
</tr>
</tbody>
</table>
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 0681

The Welsh Health Circular WHC (2007) 0822, published in December 2007, announced a 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. A Stroke Service Improvement Collaborative was identified as one of the work streams to support the delivery of this program of service improvements. The first year of the collaborative concentrated on the first seven days of care following a stroke. This guide builds on the success of the first year of this collaborative.

There are four main areas in early stroke management that have been demonstrated to reduce mortality and improve functional outcomes following stroke. This guide aims to support teams delivering Acute Stroke Services around Wales to implement changes in these four areas, which can produce measurable improvement in outcome following stroke.

The four areas are:

- Rapid recognition of symptoms and diagnosis
- 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

The aim of this programme is to improve the reliability of care provided to people who have had a stroke. Specialist stroke services should be organised and provided in such a way that anyone who has a stroke should receive evidence-based care within the appropriate time frame wherever or whenever they have their stroke.

The programme has adopted a “Care Bundle” approach to facilitate this. The interventions which have been proven to have the highest impact on outcome following stroke have been grouped together so that they are performed in the same timeframe or by a particular group of clinicians. To comply with a particular bundle, all the interventions within the bundle must be performed. Doing the group of interventions together is thought to result in a better outcome for the patient and be more efficient.
By monitoring how well they are delivering care bundles, clinical and managerial teams gain a better understanding of what improvements they need to make and what impact changing the organisation of the services has on the patients using them.

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

For acute stroke services the interventions are grouped into bundles of what should happen within the:

- First 3 Hours
- First 24 Hours
- First 3 Days
- First 7 Days

References


Throughout this guide the following abbreviations are used in references:


Improving the Reliability of Acute Stroke Care

Driver Diagram

**Content Area**

- Improve the outcomes for people following a stroke

**Drivers**

**First Hours Bundle**
- Rapid diagnosis using a recognised tool e.g. ROSIER
- Confirmation of diagnosis by experienced clinician

**First Day Bundle**
- CT scan
- Admission to co-located beds (ASU)
- Swallow screen
- Nutritional screening
- Prescription of regular aspirin (if non-haemorrhagic stroke)

**First 3 Days Bundle**
- 72 hours physiological monitoring
- Manual handling assessment
- Specialist medical review
- Physiotherapy assessment commenced
- Getting patients out of bed

**First 7 Days Bundle**
- OT assessment commenced
- Full screening and appropriate assessment of residual impairments
- MDT goals set
- Information shared with patients/carers in appropriate format
- Estimated discharge dates discussed with patients/carers

**Interventions**

- Target one
- Target two
- Target three
- Target four
Getting Started

Have you set up your team?
You need to consider three different dimensions:
- Organisational-level leadership
- Clinical or technical expertise
- Frontline leadership and team membership

See the ‘Leading the Way to Safety and Quality Improvement’ How to Guide; and Appendix B for further information.

Do you know how you will measure outcomes?
For this content area you should use the following outcome measure:
- Mortality
- Percentage of people who return to their usual place of residence
- Re-admission rates at 28 days
- Change in average functional outcome (Barthel) score on discharge

See Appendix A for further information.

Do you and your team understand how to apply the Model for Improvement?
The Model for Improvement is a fundamental building block for change and you need to understand how to use it to test, implement and spread the interventions in this guide.

See the ‘How to Improve’ Tools for Improvement guide and Appendix C for further information.

How are you going to measure process reliability?
In order to improve outcomes for your patients you need to demonstrate you are using these interventions reliably. This means that all the elements of the interventions are performed correctly on 95% or more of the occasions when they are appropriate. You need to do this by using the process measures in this guide.

See the ‘How to Improve’ Tools for Improvement guide and Appendix A for a summary of all process measures.

How will you share your learning?
Contact 1000 Lives Plus for details of mini-collaboratives and other ways to share your learning and to learn about the progress of other teams.
Drivers and Interventions

This section details the interventions highlighted in the driver diagram which evidence has shown to be effective in this content area. You should use the Model for Improvement to test, implement and spread each intervention, using the listed process and outcome measures to monitor progress.

Please note that tools suggested for use will, where possible, be linked directly from this document using hyperlinks.

All these are recommendations from the National Service Framework for Older People.

Driver: First Hours Bundle

Interventions for the First Hours Bundle:

What are we trying to accomplish within the first three hours?

- Rapid screening using a recognised tool e.g. ROSIER
- Confirmation of diagnosis by experienced clinician

The evidence

People who are admitted to accident & emergency (A&E) with a suspected stroke or TIA should have the diagnosis established rapidly using a validated tool, such as Recognition of Stroke in the Emergency Room (ROSIER).

Patients who may have had a stroke will usually require urgent hospital admission and treatment by specialist stroke teams within designated stroke units. The first stage of management is to make the correct diagnosis through careful case history taking, examination and investigation.

The diagnosis must always be confirmed by an experienced clinician with expertise in stroke.
First Hours Bundle Measures:

For this Bundle, use the following process measures:

- Time from onset of symptoms to admission
- Time from admission to screening using validated tool e.g. ROSIER
- Proportion of patients who have diagnosis screened using validated tool e.g. ROSIER
- Time from onset of symptoms to confirmation of diagnosis by experienced clinician
- Proportion of patients who have diagnosis confirmed by experienced clinician
- Compliance with First Hours Bundle

Model for Improvement Example

How will we know if a change is an improvement?

By collecting the following data points for every patient:

- date of onset of symptoms
- time of onset of symptoms
- date of admission to Emergency Departments
- time of admission to Emergency Departments
- date that diagnosis screened for using ROSIER
- time that diagnosis screened for using ROSIER
- date diagnosis confirmed by experienced clinician
- time diagnosis confirmed by experienced clinician

What changes can be made to make an improvement?

Specialist stroke services will need to develop, in liaison with their Emergency Departments:

- A protocol for screening suspected strokes, which includes a proforma with the required screening tools and for data collection
- A teaching and awareness programme for medical and clinical staff
**What teams have tried:**

Used one sheet for all the data collection as in Helpful Resources

Developed separate “bundle sheets” for use in Emergency Departments for bundles one and two which includes the ROSIER tool - see Helpful Resources

---

**Reference**

Driver: First Day Bundle

Interventions for the First Day Bundle:
What are we trying to accomplish within the first 24 hours?

- CT scan
- Admission to co-located beds (ASU)
- Swallow screen
- Nutritional screen
- Prescription of regular aspirin (if non-haemorrhagic stroke)

The Evidence:

All these are recommendations from the National Service Framework for Older People.

Brain imaging should be performed immediately (within 1 hour) for people with acute stroke if any of the following apply:

- indications for thrombolysis or early anticoagulation treatment
- on anticoagulant treatment
- a known bleeding tendency
- a depressed level of consciousness (Glasgow Coma Score (GCS) below 13)
- unexplained progressive or fluctuating symptoms
- papilloedema, neck stiffness or fever
- severe headache at onset of stroke symptoms

For all people with acute stroke without indications for immediate brain imaging, scanning should be performed as soon as possible (within a maximum of 24 hours).

All stroke patients have prompt access to an acute stroke unit and spend the majority of their time at hospital in a stroke unit with high-quality stroke specialist care.

A cost-effectiveness analysis of stroke units, aspirin and thrombolysis conducted by Hankey and Warlow (1999) showed that while the calculation of the number of deaths/dependents avoided per 1000 treated shows that thrombolysis is most effective, only 10% of stroke patients are eligible, therefore overall stroke units were found to be the more cost-effective intervention.
Improving the Reliability of Acute Stroke Care

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Number of deaths/dependents avoided per 1000 treated</th>
<th>Target population (% of all strokes)</th>
<th>Approximate cost per death or dependency avoided (AUS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke Unit</td>
<td>56</td>
<td>80</td>
<td>? nil additional</td>
</tr>
<tr>
<td>Aspirin</td>
<td>12</td>
<td>80</td>
<td>$83</td>
</tr>
<tr>
<td>Thrombolysis</td>
<td>63</td>
<td>10</td>
<td>$36,000 (t-PA) $3200 (streptokinase)</td>
</tr>
</tbody>
</table>

On admission, people with acute stroke should have their swallowing screened by an appropriately trained healthcare professional before being given any oral food, fluid or medication.

If the admission screen indicates problems with swallowing, the person should have a specialist assessment of swallowing, preferably within 24 hours of admission and not more than 72 hours afterwards.

All hospital inpatients on admission should be screened for malnutrition and the risk of malnutrition. Screening should be repeated weekly for inpatients (wording extracted from the NICE Nutrition Support recommendation).

Screening should assess body mass index (BMI) and percentage unintentional weight loss and should also consider the time over which nutrient intake has been unintentionally reduced and/or the likelihood of future impaired nutrient intake. The Malnutrition Universal Screening Tool (MUST), for example, may be used to do this. (NICE Nutrition Support recommendation).

When screening for malnutrition and the risk of malnutrition, healthcare professionals should be aware that dysphagia, poor oral health and reduced ability to self-feed will affect nutrition in people with stroke.

Screening for malnutrition and the risk of malnutrition should be carried out by healthcare professionals with appropriate skills and training. (NICE Nutrition Support recommendation).

All people presenting with acute stroke who have had a diagnosis of primary intracerebral haemorrhage excluded by brain imaging should be given 300mg aspirin as soon as possible but certainly within 24 hours.

Any person with acute ischaemic stroke for whom previous dyspepsia associated with aspirin is reported should be given a proton pump inhibitor in addition to aspirin.
Any person with acute ischaemic stroke who is allergic to or genuinely intolerant of aspirin should be given an alternative antiplatelet agent.

**Measures:**
For this Bundle, use the following process measures:

- Time from symptom onset to CT scan
- Time from admission to CT scan
- Proportion of patients who have CT scan within 24 hours of symptom onset
- Proportion of patients who have CT scan within 24 hours of admission
- Proportion of patients who have swallow assessment within 24 hours of admission
- Proportion of patients who are screened for nutrition within 24 hours
- Proportion of eligible patients who start regular aspirin within 24 hours of admission
- Time from admission to admission to a specialist stroke ward
- Compliance with First Day Bundle

**Model for Improvement Example**

*How will we know if a change is an improvement?* By collecting the following data points on every patient:

- Date of CT scan
- Time of CT scan
- Date of swallow screen
- Time of swallow screen
- Date of nutritional screen
- Time of nutritional screen
- Date of aspirin
- Time of aspirin
- Date of admission to stroke unit
- Time of admission to stroke unit
\textit{What changes can be made to make an improvement?}

Introduce policies, protocols, education and awareness programmes and data collection sheets for:

\begin{itemize}
  \item scanning patients with a suspected stroke
  \item screening a stroke patient's ability to swallow
  \item nutritionally screening of stroke patients
  \item commencing ischaemic stroke patients on aspirin, once haemorrhage is excluded
  \item direct admission to acute stroke unit from A&E or MAU
\end{itemize}

\textit{What teams have tried:}

CT scanning slots on Saturday and Sunday mornings for stroke patients admitted at the weekend.

Training programmes by speech and language therapists to ensure nurses working in Emergency Departments are competent to carry out swallow screening.

Coloured coded stickers to go in medical notes when swallow screen or nutrition screen done.

Review of patient pathway and admission policy to acute stroke bed to ensure stroke patients are admitted to stroke unit directly from Emergency Departments to access specialist assessments and interventions more quickly.

\section*{Additional References}

\begin{enumerate}
  \item The National Collaborating Centre for Chronic Conditions (2008) Stroke - National clinical guideline for diagnosis and initial management of acute stroke and transient ischaemic attack (TIA) (CG68). London. Royal College of Physicians
\end{enumerate}
Driver: First Three Days Bundle

Interventions for the First Three Days Bundle:

What are we trying to accomplish within the first three days?

- Physiological monitoring for 72 hours
- Manual handling assessment
- Specialist medical review within 48 hours
- Physiotherapy assessment commenced
- Patients mobilised or sat out of bed

The Evidence:

The patient’s physiological state should be monitored closely to include:

- blood glucose
- blood pressure
- oxygenation
- nourishment and hydration
- temperature (SNCG, 4.12.1 B)

The patient must be assessed on admission for:

- their risk of aspiration using a validated swallow screening test and in addition, feeding and nutritional status
- their needs in relation to moving and handling
- risk of developing pressure sores
- In addition to monitoring of consciousness level, blood pressure, pulse, heart rhythm, temperature, blood glucose, oxygen saturation and hydration (NSFOP, page 101)

People with acute stroke should be mobilised as soon as possible (when their clinical condition permits) as part of an active management programme on a specialist stroke unit (MPS).

People with acute stroke should be helped to sit up as soon as possible (when their clinical condition permits) (MPS).
**Measures:**

For this Bundle, use the following process measures:

- Proportion of patients who have their physiological signs monitored and recorded for first 72 hours
- Proportion of patients who have a manual handling assessment in first 72 hours
- Proportion of patients who have a specialist medical review within 48 hours
- Proportion of patients who have the time of their physiotherapy assessment recorded in the MDT notes in first 72 hours
- Proportion of patients who have the time they were sat out of bed or mobilised recorded in the MDT notes in first 72 hours
- Compliance with First Three Days Bundle

**Model for Improvement Example**

*How will we know if a change is an improvement?* By collecting the following data points on every patient:

- Physiological Monitoring for 72 hours
- Date manual handling assessment
- Time manual handling assessment
- Date of specialist medical review
- Time of specialist medical review
- Date of physiotherapy assessment
- Time of physiotherapy assessment
- Date patient sat out of bed or mobilised
- Time patient sat out of bed or mobilised

*What changes can be made to make an improvement?*

- Introduce policies, protocols, education and awareness programmes and data collection sheets for physiological monitoring and manual handling (see Helpful Resources for physiological monitoring guidance)
- Speed up referral processes and improve documentation of physiotherapy assessment in patients notes
- Ensure slings, hoists and seating appropriate for the needs of stroke patients are available on the ward
What teams have tried:

Development of physiological monitoring sheets and training for nursing staff on use of monitoring equipment.

Development of physiological monitoring standards - see Helpful Resources.

Colour-coded stickers to go in medical notes to record date and time of physiotherapy assessment.

Use of initial joint assessment form - see Helpful Resources.

References


Driver: First Seven Days Bundle

Interventions for the First Seven Days Bundle:  
What are we trying to accomplish within first seven days?
- OT assessment commenced
- Full screening and appropriate assessment of residual impairments
- MDT goals set
- Information sharing with patients/carers in appropriate format
- Estimated discharge dates discussed with patients/carers

Evidence
Within 5 days of admission multi-disciplinary baseline assessments must be carried out using a standardised, validated procedure or protocol. Results, goals and evaluation of rehabilitation must be documented in the care plan. (NSFOP p.103)

All patients should be assessed within a few hours of admission for their:
- ability to swallow, using a validated swallow screening test (eg 50-ml water swallow) administered by an appropriately trained person
- immediate needs in relation to positioning, mobilisation, moving and handling
- bladder control
- risk of developing skin pressure ulcers
- capacity to understand and follow instructions
- capacity to communicate their needs and wishes
- nutritional status
- ability to hear, and need for hearing aids
- ability to see, and need for glasses (MPS, 4.18.1 A)

All patients with any impairment at 24 hours should receive a full multidisciplinary assessment using an agreed procedure or protocol within five working days, and this should be documented in the notes. (MPS, 4.18.1 B)

All patients entering a period of active rehabilitation should be screened for common impairments using locally agreed tools and protocols. (MPS, 1.1 A)

Patients should always be informed of realistic prospects of recovery or success and should always have realistic goals set. (MPS, 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. (MPS, 6.1.1 E)

Measures:

For this Bundle, use the following process measures:

- Proportion of patients who have an OT assessment in first 7 days
- Proportion of patients who are screened for all impairments related to stroke within the first 7 days
- Proportion of patients who have goals set and agreed in first 7 days
- Proportion of patients who receive information about their care in an appropriate format in first 7 days
- Proportion of patients who are notified of an estimated date of discharge within 7 days
- Compliance with First Seven Days Bundle

Applying the Model For Improvement

How will we know if a change is an improvement?

By collecting the following data points for every patient:

- Date of occupational therapy assessment
- Date that screening of impairments completed
- Date that MDT goals agreed
- Date that information given to patients and carers
- Date that EDD discussed with patient and carers

What changes can be made to make an improvement?

Introducing:

- Referral processes for, and documentation of, occupational therapy
- Protocols, agreed screening tools, education and awareness programmes and data collection sheets for assessing stroke impairments (see Helpful Resources for a list of impairments, activity and participation limitations commonly associated with stroke in line with WHO classification of dysfunction)
- An agreed constitution for multi-disciplinary team goal planning
A process for sharing information with patients and their families, which is documented and supported by information in a format appropriate for the patients ability to communicate

A process and method for documenting discussions of estimated discharge dates with patients and their carers

What teams have tried:

Introduction of open/paperless referral system for all stroke patients for occupational therapy.

Review multi-disciplinary team meetings and agreement of constitution as in Helpful Resources.

For more ideas on things to try see the End of Year Report for the first year of the Stroke Collaborative. National Leadership and Innovation Agency for Healthcare (2009) All Wales Stroke Services Improvement Collaborative End of Year Report. NLIAH (Available at www.nliah.nhs.uk)

References


Helpful Resources

*Stroke Services Improvement Partnership: Stroke Intranet Site*
www.stroke.wales.nhs.uk

*Institute for Healthcare Improvement*
www.IHI.org

*NHS Evidence - Stroke*
www.library.nhs.uk/stroke/

*NHS Improvement - Stroke*
www.improvement.nhs.uk/stroke/
## Minimum Dataset

<table>
<thead>
<tr>
<th>Segment</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID Number</td>
<td>-</td>
</tr>
<tr>
<td>Date of Onset</td>
<td>-</td>
</tr>
<tr>
<td>Time of Onset</td>
<td>-</td>
</tr>
<tr>
<td>Date of Admission</td>
<td>-</td>
</tr>
<tr>
<td>Time of Admission</td>
<td>-</td>
</tr>
<tr>
<td>First Hours</td>
<td>ROSIER</td>
</tr>
<tr>
<td></td>
<td>Clinical Diagnosis</td>
</tr>
<tr>
<td></td>
<td>Functional Score on Admission</td>
</tr>
<tr>
<td>First Day</td>
<td>CT</td>
</tr>
<tr>
<td></td>
<td>Direct Admission to Stroke Bed</td>
</tr>
<tr>
<td></td>
<td>Swallow Screen</td>
</tr>
<tr>
<td></td>
<td>Regular Aspirin</td>
</tr>
<tr>
<td></td>
<td>Nutritional Screen</td>
</tr>
<tr>
<td>First 3 Days</td>
<td>Manual Handling Assessment</td>
</tr>
<tr>
<td></td>
<td>Specialist Review</td>
</tr>
<tr>
<td></td>
<td>Physiological Monitoring</td>
</tr>
<tr>
<td></td>
<td>Physiotherapy</td>
</tr>
<tr>
<td></td>
<td>Patient</td>
</tr>
<tr>
<td>First 7 Days</td>
<td>OT Assessment</td>
</tr>
<tr>
<td></td>
<td>Patient Information</td>
</tr>
<tr>
<td></td>
<td>Screen of all impairments</td>
</tr>
<tr>
<td></td>
<td>MDT Goals Set</td>
</tr>
<tr>
<td></td>
<td>EDD Agreed</td>
</tr>
<tr>
<td>Discharge Date</td>
<td>-</td>
</tr>
<tr>
<td>Date of Death</td>
<td>-</td>
</tr>
<tr>
<td>Functional Score on Discharge</td>
<td>-</td>
</tr>
<tr>
<td>Readmission Date</td>
<td>-</td>
</tr>
</tbody>
</table>
ACUTE STROKE – FIRST HOURS AND FIRST DAY BUNDLE

Patient Name: ID Number:
Date of admission: Time of admission:

COULD THIS PATIENT HAVE SUFFERED A STROKE OR TIA?

YES

FIRST STEP
Use ROSIER scale to establish provisional diagnosis

STROKE LIKELY

NEXT STEPS
Diagnosis confirmed by an experienced clinician
CT Scan requested
CT scan performed
Swallow assessment
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>

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

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

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

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Exception</th>
<th>Sign</th>
</tr>
</thead>
</table>
ROSIER Scale
Stroke Assessment

The aim of this assessment tool is to enable medical and nursing staff to differentiate patients with stroke and stroke mimics.

Assessment  Date  Time
Symptom onset  Date  Time

GGS E=  M=  V=  BP  'BM

*If BM < 3.5 mmol/l treat urgently and reassess once blood glucose normal

Has there been loss of consciousness or syncope?
Y (-1)  N (0)  

Has there been seizure activity?
Y (-1)  N (0)  

Is there a NEW ACUTE onset (or on awakening from sleep)?

I. Asymmetric facial weakness
Y (+1)  N (0)  

II. Asymmetric arm weakness
Y (+1)  N (0)  

III. Asymmetric leg weakness
Y (+1)  N (0)  

IV. Speech disturbance
Y (+1)  N (0)  

V. Visual field defect
Y (+1)  N (0)  

*Total Score  (-2 to +5)

Provisional diagnosis:  □ Stroke  □ Non-stroke (specify) ____________

* Stroke is likely if total scores are > 0. Scores of ≤ 0 have a low possibility of stroke but not completely excluded.
**Physiological Monitoring Guidelines for AWSSIC developed by project leads**

Summary of Guidance recommendations

<table>
<thead>
<tr>
<th>Physiological Measure</th>
<th>RCP Guidelines</th>
<th>NICE Guideline 68</th>
<th>NSF Older People</th>
<th>Map of Medicine</th>
<th>AOF 2008/9</th>
<th>WHC (2007) 082</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td></td>
<td>p. 102</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulse</td>
<td></td>
<td>p.102</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blood Pressure</td>
<td>4.13.1.E</td>
<td>R 38</td>
<td>p.102</td>
<td>Yes</td>
<td>Continuous</td>
<td>Continuous</td>
</tr>
<tr>
<td>Oxygen Saturation</td>
<td>4.13.1A</td>
<td>R 39</td>
<td>p.102</td>
<td>Yes</td>
<td>Continuous</td>
<td>Continuous</td>
</tr>
<tr>
<td>Blood Sugar</td>
<td>4.13.1 B</td>
<td>R 41 &amp; 42</td>
<td>p.102</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cardiac Rhythm</td>
<td></td>
<td>R 41</td>
<td>p.102</td>
<td>Yes</td>
<td>Continuous</td>
<td>Continuous</td>
</tr>
<tr>
<td>Conscious Level</td>
<td>4.5.1 A</td>
<td>R 41</td>
<td>p.102</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.6.1 K</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.7.1 D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluid Intake 24hr</td>
<td>4.16.1 F</td>
<td>In 2009 Audit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nutrition</td>
<td>4.12.1 B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
All stroke patients should have:

- temperature
- pulse
- blood pressure
- oxygen saturation
- cardiac rhythm
- GCS monitoring

Monitored:

- Every 2-4 hours for first 24 hours
- Then every 6 hours from 24 to 36 hours
- Then every 12 hours from 36 to 72 hours
- Once every 24 hours
  - blood sugar
  - fluid intake
  - nutritional intake as a minimum requirement

If their physiological signs fall outside the normal parameters action should be taken. Oxygen saturation and cardiac rhythm should be monitored continuously and neurological status every hour until they return to normal.
### WHO International Classification of Functioning (WHO-ICF) common problems associated with stroke

<table>
<thead>
<tr>
<th>Impairments</th>
<th>Impairments</th>
<th>Limitations in Participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>Ability to protect airway</td>
<td>Driving</td>
</tr>
<tr>
<td>Aphagia</td>
<td>Ability to maintain oral health and hygiene</td>
<td>Education</td>
</tr>
<tr>
<td>Aphasia</td>
<td>Ability to maintain adequate hydration</td>
<td>Employment</td>
</tr>
<tr>
<td>Ataxia</td>
<td>Ability to maintain adequate nutrition</td>
<td>Financial</td>
</tr>
<tr>
<td>Cardiovascular fitness</td>
<td>Ability to maintain skin integrity</td>
<td>Family Role</td>
</tr>
<tr>
<td>Bowel function</td>
<td>Ability to manage elimination</td>
<td>Home environment</td>
</tr>
<tr>
<td>Cognitive impairment</td>
<td>Ability to communicate effectively</td>
<td>Work environment</td>
</tr>
<tr>
<td>Contractures</td>
<td>Personal activities of daily living</td>
<td>Leisure</td>
</tr>
<tr>
<td>Depression</td>
<td>Extended activities of daily living</td>
<td>Social Role</td>
</tr>
<tr>
<td>Dysarthria</td>
<td>Posture - ability to gain/maintain, seating</td>
<td>Productivity</td>
</tr>
<tr>
<td>Dysphagia</td>
<td>Bed Mobility</td>
<td></td>
</tr>
<tr>
<td>Emotionalism (tearfulness)</td>
<td>Transfers e.g. from bed to chair</td>
<td></td>
</tr>
<tr>
<td>Executive function</td>
<td>Walking/ Gait</td>
<td></td>
</tr>
<tr>
<td>Fatigue</td>
<td>Wheelchair mobility</td>
<td></td>
</tr>
<tr>
<td>Hearing</td>
<td>Ability to self medicate effectively</td>
<td></td>
</tr>
<tr>
<td>Inattention</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malnutrition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mood disturbance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motor control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Muscle weakness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neglect (spatial awareness)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral hygiene</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceptual problems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensory disturbance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shoulder subluxation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sexual function</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spasticity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swelling/ oedema</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tone disturbance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urinary incontinence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visual disturbance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volition</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Joint Initial Assessment Form - devised in Morriston Hospital

Physiotherapy / Occupational Therapy
STROKE INITIAL ASSESSMENT FORM

WARD: ________________________________

DIAGNOSIS: ________________________________

CONSENT TO CONTACT CARER: YES ☐ NO ☐

CONSENT TO ASSESSMENT / INTERVENTION: YES ☐ NO ☐

CONSENT TO SHARE INFORMATION WITH OTHERS: YES ☐ NO ☐

MANUAL HANDLING PLAN CHECKED: YES ☐ NO ☐

Patient Goals: 1. _____________________________________________
  2. _____________________________________________
  3. _____________________________________________
  4. _____________________________________________

<table>
<thead>
<tr>
<th>Date</th>
<th>Functional Aims</th>
<th>Inactive / Achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Patient/Carers Concerns: _____________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________

Name of Therapist: ___________________________ Signature: ___________________________  
Designation: ___________________________  Date: ___________________________
Improving the Reliability of Acute Stroke Care

<table>
<thead>
<tr>
<th>ENVIRONMENT PHYSICAL</th>
<th>COMMENTS</th>
<th>Ax Rqd (tick)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type:</strong></td>
<td>Flat / house / bungalow / other:</td>
<td></td>
</tr>
<tr>
<td><strong>Ownership:</strong></td>
<td>Private / rented</td>
<td></td>
</tr>
<tr>
<td><strong>Heating:</strong></td>
<td>GCH / oil / coal</td>
<td></td>
</tr>
<tr>
<td><strong>Bathroom / toilet:</strong></td>
<td>up / down / in / out</td>
<td></td>
</tr>
<tr>
<td><strong>Stairs / steps:</strong></td>
<td>internal external</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOCIO-CULTURAL</th>
<th>COMMENTS</th>
<th>Ax Rqd (tick)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patient Lives:</strong></td>
<td>Alone / with family / spouse / children / friends / pets</td>
<td></td>
</tr>
<tr>
<td><strong>Social support:</strong></td>
<td>POC/ Family / friend support</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SENSORY MOTOR</th>
<th>COMMENTS</th>
<th>Ax Rqd (tick)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tone:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sensation:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Proprioception:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Co-ordination:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ROM:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Balance:</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COGNITIVE / PERCEPTUAL</th>
<th>COMMENTS</th>
<th>Ax Rqd (tick)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Day:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Month:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Year:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>DOB:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Place:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Home Address:</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MOBILITY</th>
<th>COMMENTS</th>
<th>Ax Rqd (tick)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Walking in / out:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Wheelchair:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Falls:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Stairs:</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ADL</th>
<th>COMMENTS</th>
<th>Ax Rqd (tick)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bed:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Chair:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Toilet:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Washing / Dressing:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Meal prep:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Shopping:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Laundry:</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WORK / LEISURE</th>
<th>COMMENTS</th>
<th>Ax Rqd (tick)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employed / unemployed / retired</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leisure activities:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Goal-Planning Meeting Constitution devised in Royal Gwent Hospital

The aim of this system is to formalise the current goal planning meetings to aid structure, focus and effectiveness as a multi-disciplinary team in identifying stroke patient’s needs and goals as a part of their management plan on the Acute Stroke Unit. This is in accordance with the Royal College of Physicians Guidelines on Stroke management and in concordance with the present NLIAH PDSA cycles and promotion of effective change.

- Meetings will be held every Tuesday at 11:30 prompt with the aim to complete by 12:30.
- A Chairperson will be nominated to lead these goal planning meetings.
- In the absence of the Chairperson the Deputy Chairperson will be identified as the person named to complete the goal-planning form on the allocation sheet.
- An allocation list will be available to ensure each discipline’s participation in the completion of the Barthel Score and goal planning forms.
- Barthel Scores and goal planning forms will be completed on each patient.
- These forms will be secured in the medical notes to access for the following goal planning meetings.
- The Chairperson will structure the meetings using the goal planning forms to discuss with relevant disciplines.
- The next patient will not be discussed until the full completion of the forms and goals are set for the previous patient.
- The allocated discipline identified to complete the goal-planning forms is not responsible for the formation of the goals.
- The Chairperson will conclude each discussion about a patient with the formation of medical, nursing and therapeutic goals.
- Each goal will be documented in the medical notes by the doctor.
- Medical information and management of each patient will be succinct, only stipulating if the patient is medically fit or unfit for discharge or transfer. For patients who remain unfit a brief account of the reasons why will be given.
- All members will ensure that no disruptions occur and respect for each individuals input is maintained to promote an efficient and timely meeting.

Kylie Crook/CNS/RGH/2009
### Appendix A - Measures and Definitions

<table>
<thead>
<tr>
<th>Process Measure</th>
<th>Numerator</th>
<th>Denominator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time from onset of symptoms to admission</td>
<td>Time and date of admission - Time and date of symptom onset</td>
<td>Number of patients admitted with suspected stroke</td>
</tr>
<tr>
<td>Time from admission to screening using validated tool e.g. ROSIER</td>
<td>Time and date screening completed - Time and date of admission</td>
<td>Number of patients admitted with suspected stroke</td>
</tr>
<tr>
<td>Proportion of patients who have diagnosis screened using validated tool e.g. ROSIER*</td>
<td>Number of patients who have diagnosis screened using validated tool e.g. ROSIER x 100</td>
<td>Number of patients admitted with suspected stroke</td>
</tr>
<tr>
<td>Time from onset of symptoms to confirmation of diagnosis by experienced clinician</td>
<td>Time and date diagnosis confirmed by experienced clinician - Time and date of admission</td>
<td>Number of patients admitted with suspected stroke</td>
</tr>
<tr>
<td>Proportion of patients who have diagnosis confirmed by experienced clinician*</td>
<td>Number of patients who have diagnosis confirmed by experienced clinician x 100</td>
<td>Number of patients admitted with suspected stroke</td>
</tr>
<tr>
<td>Proportion of patients whose care complies with the First 3 Hours Bundle</td>
<td>Number of patients who receive all elements of care bundle within First 3 Hours x 100</td>
<td>Number of patients admitted with suspected stroke</td>
</tr>
<tr>
<td>Time from symptom onset to CT scan</td>
<td>Time and date of CT scan  - Time and date of symptom onset</td>
<td>Number of patients with stroke confirmed by clinical examination</td>
</tr>
<tr>
<td>Time from admission to CT scan</td>
<td>Time and date of CT scan - Time and date of admission</td>
<td>Number of patients with stroke confirmed by clinical examination</td>
</tr>
<tr>
<td>Proportion of patients who have CT scan within 24 hours of symptom onset</td>
<td>Number of patients who receive CT scan within 24 hours of symptom onset x 100</td>
<td>Number of patients with stroke confirmed by clinical examination</td>
</tr>
<tr>
<td>Proportion of patients who have CT scan within 24 hours of admission**</td>
<td>Number of patients who receive CT scan within 24 hours of admission x 100</td>
<td>Number of patients with stroke confirmed by clinical examination</td>
</tr>
<tr>
<td>Proportion of patients who have swallow assessment within 24 hours of admission**</td>
<td>Number of patients who have swallow assessment within 24 hours of admission x 100</td>
<td>Number of patients with stroke confirmed by clinical examination</td>
</tr>
<tr>
<td>Metric</td>
<td>Formula</td>
<td>Metric</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Proportion of patients who are screened for nutrition within 24 hours</td>
<td>Number of patients who have nutrition screen within 24 hours of admission x 100</td>
<td>Number of patients with stroke confirmed by clinical examination</td>
</tr>
<tr>
<td>Proportion of eligible patients who start regular aspirin within 24 hours of admission**</td>
<td>Number of patients who start regular aspirin within 24 hours of admission x 100</td>
<td>Number of patients who have had haemorrhage excluded by CT scan</td>
</tr>
<tr>
<td>Time from admission to admission to a specialist stroke ward</td>
<td>Time and date of admission to a specialist stroke ward Time and date of admission</td>
<td>Number of patients with stroke confirmed by clinical examination</td>
</tr>
<tr>
<td>Proportion of patients whose care complies with the First Day Bundle</td>
<td>Number of patients who receive all elements of care bundle within First 24 Hours x 100</td>
<td>Number of patients with stroke confirmed by clinical examination</td>
</tr>
<tr>
<td>Proportion of patients who have their physiological signs monitored and recorded for first 72 hours***</td>
<td>Number of patients who have their physiological signs monitored and recorded for first 72 hours x 100</td>
<td>Number of patients with stroke confirmed by clinical examination</td>
</tr>
<tr>
<td>Proportion of patients who have a manual handling assessment in first 72 hours***</td>
<td>Number of patients who have a manual handling assessment in first 72 hours x 100</td>
<td>No of patients with stroke confirmed by clinical examination</td>
</tr>
<tr>
<td>Proportion of patients who have a specialist medical review within 48 hours</td>
<td>Number of patients who have a specialist medical review within 48 hours x 100</td>
<td>Number of patients with stroke confirmed by clinical examination</td>
</tr>
<tr>
<td>Proportion of patients who have the time of their physiotherapy assessment recorded in the MDT notes in first 72 hours***</td>
<td>Number of patients who have the time of their physiotherapy assessment recorded in the MDT notes in first 72 hours x 100</td>
<td>Number of patients with stroke confirmed by clinical examination</td>
</tr>
<tr>
<td>Proportion of patients who have the time they were sat out of bed or mobilised recorded in the MDT notes in first 72 hours***</td>
<td>No of patients who have the time they were sat out of bed or mobilised recorded in the MDT notes in first 72 hours x 100</td>
<td>Number of patients with stroke confirmed by clinical examination</td>
</tr>
<tr>
<td>Proportion of patients whose care complies with the First Three Days Bundle</td>
<td>Number of patients who receive all elements of the First 3 Days Bundle x 100</td>
<td>Number of patients with stroke confirmed by clinical examination</td>
</tr>
<tr>
<td>Proportion of patients who have an OT assessment in first 7 days****</td>
<td>Number of patients who have an OT assessment in first 7 days x 100</td>
<td>Number of patients with stroke confirmed by clinical examination</td>
</tr>
</tbody>
</table>
Improving the Reliability of Acute Stroke Care

<table>
<thead>
<tr>
<th>Outcome Measure</th>
<th>Formula</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion of patients who are screened for all impairments related to stroke within the first 7 days</td>
<td>Number of patients who are screened for all impairments related to stroke within the first 7 days x 100</td>
<td>Number of patients with stroke confirmed by clinical examination</td>
</tr>
<tr>
<td>Proportion of patients who have goals set and agreed in first 7 days***</td>
<td>Number of patients who have goals set and agreed in first 7 days x 100</td>
<td>Number of patients with stroke confirmed by clinical examination</td>
</tr>
<tr>
<td>Proportion of patients who receive information about their care in an appropriate format in first 7 days****</td>
<td>Number of patients who receive information about their care in an appropriate format in first 7 days x 100</td>
<td>Number of patients with stroke confirmed by clinical examination</td>
</tr>
<tr>
<td>Proportion of patients who are notified of an estimated date of discharge within 7 days****</td>
<td>Number of patients who are notified of an estimated date of discharge within 7 days x 100</td>
<td>Number of patients with stroke confirmed by clinical examination</td>
</tr>
<tr>
<td>Proportion of patients whose care complies with the First Seven Days Bundle</td>
<td>Number of patients who receive all elements of the First Seven Days Bundle x 100</td>
<td>Number of patients with stroke confirmed by clinical examination</td>
</tr>
</tbody>
</table>

*incorporate in First Hours Bundle
** incorporate in First Day Bundle - Emergency Treatment
***incorporate in First Three Days Bundle
****Incorporate in First Seven Days Bundle

Outcome Measures

These three outcome measures will be based on data extracted from PEDW for patients who are admitted with ICD10 codes I61 and I63.

- Mortality rate
- Percentage of people who return to their usual place of residence
- Re-admission rate at 28 days post discharge

Further work is under way to develop clearer definitions for these outcome measures.

The dataset collected by the multi-disciplinary clinical teams will provide the data for the following outcome measure. The data collection tool will display this outcome measure as a run chart:

- Change in average functional outcome (Barthel) score on discharge
Appendix B - Setting up your team

Achieving improvements that reduce harm, waste and variation at a whole-organisation level needs a team approach: one person working alone, or groups of individuals working in an unco-ordinated way will not achieve it and this applies equally at all organisational levels.

Whether your improvement priorities relate to 1000 Lives Plus content areas, national intelligent targets or other local priorities, you need to consider three different dimensions in putting your team together:

■ Organisation level leadership.
■ Clinical or technical expertise.
■ Frontline leadership.

There may be one or more individuals on the team working in each dimension, and one individual may fill more than one role, but each component should be represented in order to achieve sustainable improvement.

**Organisation level leadership**

An Executive, or equivalent level Director, should always be given delegated accountability from the Chief Executive for a specific content area; and all staff working on the changes should know who this is. This individual needs sufficient influence and authority to allocate the time and resources necessary for the work to be undertaken. It is likely that accountability will be further delegated to Divisions, Clinical Programme Groups or Directorates and this can help to build ownership and engagement at a more local level. However, it is essential that the leader has full authority over the areas involved in achieving the improvement aim. As changes spread more widely, crossing organisational boundaries, appropriate levels of delegation will need to be reviewed.

When working with frontline teams, it is essential for organisational level leaders to have an understanding of the improvement methodology and to base conversations around the interpretation of improvement data. Reporting of progress to higher organisational levels should also use a consistent data format so that the Executive level leader can report to the Board on progress.

**Clinical/Technical Expertise**

A clinical or technical expert is someone who has a full professional understanding of the processes in the content area. It is critical to have at least one such champion on the team who is intimately familiar with the roles, functions, and operations of the content area. This person should have a good working relationship with colleagues and with the frontline leaders, and be interested in driving change in the system. It is important to look for clinicians or technical professionals who are opinion leaders in the organisation (individuals sought out for advice who are not afraid to try changes).
Patients can provide expert advice to the improvement team, based on their experience of the system and the needs and wishes of patients. A patient with an interest in the improvement of the system can be a useful member of the team. Additional technical expertise may be provided by an expert on improvement methodology, who can help the team to determine what to measure, assist in the design of simple, effective measurement tools, and provide guidance on the design of tests.

**Frontline leadership**

Frontline leaders will be the critical driving component of the team, ensuring that changes are tested and overseeing data collection. It is important that this person understands not only the details of the system, but also the various effects of making changes in the system. They should have skills in improvement methods. This individual must also work effectively with the technical experts and system leader. They will be seen as a bridge between the organisation leadership and the day-to-day work.

Frontline leaders are likely to devote a significant amount of their time to the improvement work, ensuring accurate and timely data collection for process and outcome measures related to the frontline team.

**Characteristics of a good team member**

In selecting team members, you should always consider those who want to work on the project rather than trying to convince those that do not. Some useful questions to consider are the following:

- Is the person respected for their judgment by a range of staff?
- Do they enjoy a reputation as a team player?
- What is the person’s area of skill or technical proficiency?
- Are they an excellent listener?
- Is this person a good verbal communicator within, and in front of, groups?
- Is this person a problem-solver?
- Is this person disappointed with the current system and processes and do they passionately want to improve things?
- Is this person creative, innovative, and enthusiastic?
- Are they excited about change and new technology?
Appendix C - The Model for Improvement

Successful improvement initiatives don’t just happen - they need careful planning and execution. There are many things to consider and techniques to employ, which are captured in the driver diagram on page 38. The rest of this section explains the primary drivers and where to get more help in using them.

In any improvement initiative you need to succeed in three areas. You need to generate the Will to pursue the changes, despite difficulties and competing demands on time and resources. You need the good Ideas that will transform your service. Finally you need to Execute those ideas effectively to get the change required.

Will

The interventions you need to build Will are explained in the ‘Leading the Way to Safety and Quality Improvement’ and ‘How to Improve’ guides. They concentrate on raising the commitment levels for change and then providing the project structure to underpin improvement approaches. Spreading changes to achieve transformative change across the whole health system requires strong leadership. We need to create an environment where there is an unstoppable will for improvement and a commitment to challenge and support teams to remove any obstacles to progress.

Ideas

The interventions in this guide describe ideas which evidence shows to be effective for achieving changes that result in improvements. It gives examples from organisations that have achieved them and also advice based on their experience. Methods and techniques for generating new ideas or innovative ways to implement the evidence can be found in the ‘How to Improve’ guide and other improvement literature.

Execution

However, to bring these ideas into routine practice in your organisation, it is essential that you test the interventions and ensure that you have achieved a reliable change in your processes before attempting to spread the change more widely.

1000 Lives Plus uses the Model for Improvement (MFI) which is a proven methodology as the basis for all its improvement programmes. It requires you to address three key questions and then use Plan-Do-Study-Act (PDSA) cycles to test a change idea. By doing repeated small-scale tests, you will be able to adapt change ideas until they result in the reliable process improvement you require. Only then are you ready to implement and spread the change more widely.
Improving the Reliability of Acute Stroke Care

Model for Improvement

Driver Diagram

**Aim**

To deliver patient safety and quality initiatives for Health Boards and Trusts

**Primary drivers**

Create an organisational culture and environment for improvement

**Secondary drivers**

Use the relevant content area ‘How to Guide’ to assess the latest evidence of best practice

**Interventions**

- Engage senior leadership
- Make links to organisation goals
- Form teams
- Build skills
- Raise awareness
- Appoint clinical champions
- Consult Faculty members to agree standards to be achieved
- Use critical sub sets of key content areas to improve the outcome

**Execution**

Improvement Methodology (The how to)

- Establish reliable process

**Will**

- Will

**Ideas**

Evidence Base (The what to)

- Ideas

**The Model for Improvement**

- What are you trying to accomplish?
- How will you know that a change is an improvement?
- What change can you make that will result in improvement?

PDSA cycles:

- Test - implement - spread - sustain

Set SMART aims

- Communicate aims
- Use project charter to provide structure
- Understand what to measure
- Use 7 step measurement process
- Map the process
- Use creative thinking

Use reliability model
Improving the Reliability of Acute Stroke Care

**Model for Improvement-PDSA Cycle**

1. What are we trying to accomplish?
2. How will we know that a change is an improvement?
3. What change can we make that will result in improvement?

**Seven Steps to Measurement**

1. Decide aim
2. Choose measures
3. Define measures
4. Collect data
5. Analyse & present
6. Review measures
7. Repeat steps 4-6
One area that bears extra attention is measurement because we have found that this is often the Achilles heel of improvement projects. When measuring your progress, follow the Seven Steps to Measurement shown on page 39 and covered in more detail in the ‘How to Improve’ Guide.

The key is to go round the Collect-Analyse-Review cycle frequently:

- **Collect** your data
- **Analyse** - turn it into something useful like a run chart
- **Review** - meet to decide what your data is telling you and then take action

Successful improvement projects all have clear aims, robust measurement and well-tested ideas. Use the ‘How to Improve’ guide to ensure your projects have all three.

**What are we trying to accomplish?**

You will need to set an aim that is Specific, Measurable, Achievable, Realistic and Time-bound (SMART). Everyone involved in the change needs to understand what this is and be able to communicate it to others.

**How will we know that change is an improvement?**

It is essential to identify what data you need to answer this question and how to interpret what the data is telling you. The improvement methodology ‘How to Guide’ provides detailed information on the tools, tips and information you need to achieve this, and includes the following advice:

- **Plot data over time** - Tracking a few key measures over time is the single most powerful tool a team can use.
- **Seek usefulness, not perfection.** Remember, measurement is not the goal; improvement is the goal. In order to move forward to the next step, a team needs just enough data to know whether changes are leading to improvement.
- **Use sampling.** Sampling is a simple, efficient way to help a team understand how a system is performing.
- **Integrate measurement into the daily routine.** Useful data is often easy to obtain without relying on information systems.
- **Use qualitative and quantitative data.** In addition to collecting quantitative data, be sure to collect qualitative data, which is often easier to access and highly informative.
- **Understand the variation that lives within your data.** Don’t overreact to a special cause and don’t think that random movement of your data up and down is a signal of improvement.
What change can we make that will result in improvement?

The interventions in this guide describe a range of change ideas that are known to be effective. However, you need to think about your current local systems and processes and use the guide as a starting point to think creatively about ideas to test. The improvement methodology guide gives more advice to support you in generating ideas.

Spreading changes to achieve transformative change across the whole health system requires strong leadership. We need to create an environment where there is an unstoppable will for improvement and a commitment to challenge and support teams to remove any obstacles to progress. The guide on ‘Leading the Way to Safety and Quality Improvement’ gives detailed information on interventions that will support this. However, the Model for Improvement, PDSA cycles and process measurement lie at the heart of the transformative change we seek.
Improving care, delivering quality

If we can improve care for one person, then we can do it for ten.

If we can do it for ten, then we can do it for a 100.

If we can do it for a 100, we can do it for a 1000.

And if we can do it for a 1000, we can do it for everyone in Wales.

www.1000livesplus.wales.nhs.uk