How to Guide

1000 Lives
Improving care, delivering quality

Improving Acute Coronary Syndromes Care

www.1000livesplus.wales.nhs.uk
Acknowledgements

This guide has been produced by Dr Phillip Thomas and Marc Thomas in collaboration with the Cardiac Networks of Wales.

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1000 Lives Plus is run as a collaborative, involving the National Leadership and Innovation Agency for Healthcare, Public Health Wales and the Welsh Government.

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Date of publication

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

The 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 in relation to Acute Coronary Syndromes (ACS).

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>8</td>
</tr>
<tr>
<td>Getting Started</td>
<td>9</td>
</tr>
<tr>
<td>Drivers and Interventions</td>
<td>10</td>
</tr>
<tr>
<td>Helpful Resources</td>
<td>18</td>
</tr>
<tr>
<td><strong>Appendices</strong></td>
<td></td>
</tr>
<tr>
<td>Measures</td>
<td>26</td>
</tr>
<tr>
<td>Setting up your team</td>
<td>28</td>
</tr>
<tr>
<td>The Model for Improvement</td>
<td>30</td>
</tr>
<tr>
<td>Glossary</td>
<td>35</td>
</tr>
</tbody>
</table>
What are Acute Coronary Syndromes?

For the purposes of this programme area, the term Acute Coronary Syndromes (ACS) is taken to cover all myocardial infarctions (STEMI and NSTEMI) including unstable angina (UA).

Coronary Heart Disease can manifest as a spectrum of presentations, from those patients with stable coronary disease usually presenting with angina, where there are obstructive coronary stenoses or narrowings, to those with more acute symptoms often occurring at rest, where the underlying condition is usually one of arterial plaque rupture and thrombosis.

These latter syndromes can present without any evidence of myocardial cell death or troponin rise (unstable angina(UA)); with evidence of minor cell death, small troponin rises and no ST elevation on the ECG (non-ST elevation myocardial infarction (NSTEMI)), or with larger areas of cell necrosis, higher troponin rises and ST elevation on the ECG (ST elevation myocardial infarction (STEMI)).

Patient history alone is often insufficient to make a diagnosis of ACS. The clinical dilemma of distinguishing between cardiac and non-cardiac chest pain requires a combination of:

- Patient history
- Electrocardiogram (ECG)
- Biomarkers such as troponin

Standard 3 of ‘Cardiac Disease National Service Framework’ (NSF) outlines the care and management of patients with ACS. Patients with ACS have improved outcomes from the introduction of early and appropriate therapy within the appropriate environment at the appropriate time, and therefore stand to gain much from a well-organised responsive health service.

The Cardiac Disease NSF is supported by Cardiac Quality Requirements (QRs) designed to support the implementation of the NSF. The QRs focus on the processes needed to implement the NSF. This guide should be read in conjunction with both the Cardiac Disease NSF and the Cardiac QRs.

The Practice Gap

There is a large practice gap between optimal and actual patterns of care for patients with ACS in hospitals around the world. STEMI is a highly treatable condition for which many advances in treatment have occurred over the past several decades including intravenously administered thrombolysis and more recently primary percutaneous coronary intervention (PPCI), formerly called primary angioplasty.

ACS represent a major cause of morbidity and mortality for patients with cardiovascular disease, but evidence-based therapies shown to improve outcomes for ACS are often underused in clinically eligible patients. Systematic reviews
Improving Acute Coronary Syndromes Care

of quality-improvement studies have shown that multifaceted approaches using targeted educational interventions, creation of quality standards, and regular performance feedback are needed to ensure sustained improvements in care.

Approaches to quality improvement are thus being redirected within this 1000 Lives Plus programme to focus on multidisciplinary collaborations designed to improve the entire process of care for patients with ACS.

Peterson et al⁴, suggest that there is a significant association between care process and outcomes, supporting the use of broad guideline-based performance metrics as a means of assessing and helping improve care delivered.

The Myocardial Ischaemia National Audit Project (MINAP) began to collect data in October 2000 and has continued to do so, producing the largest repository of data of ACS cases in the world. Since it started it has amassed cumulative data on more than 700,000 admissions in England and Wales.

MINAP data suggest that an increased survival from MI has occurred firstly as a result of faster thrombolytic treatment in hospital, then on the introduction of pre-hospital thrombolysis and finally the increased use of PPCI. During 2009 for the UK as a whole, the use of PPCI exceeded that of thrombolysis, though in Wales thrombolysis remains the most common form of reperfusion therapy, despite PPCI producing superior benefit for the patient.⁵

MINAP also reports that the use of secondary prevention therapies (including aspirin, statin, beta blockers and ACE inhibitors) continues to exceed National standards in Wales and in England.

ACS Intervention

Overlapping clinical entities in the ACS spectrum of disease allows for similar treatment strategies. The ACS spectrum concept (European Oxford Heart Journals) is a useful framework for developing therapeutic strategies.
Antithrombin therapy (usually heparin or fondaparinux) and antiplatelet therapy (usually aspirin and clopidogrel) should be administered to all patients with ACS regardless of the presence or absence of ST-segment elevation.

Patients presenting with persistent ST-segment elevation (STEMI) are candidates for reperfusion therapy (either pharmacological or catheter based) to restore flow promptly in the occluded coronary artery. “Time is myocardium” is the dictum in management of STEMI as survival has been shown to correlate with time to reperfusion in these patients: for every minute lost to reperfusion, survival is estimated to be reduced by 11 days.

Patients presenting without ST-segment elevation may not be candidates for immediate pharmacological reperfusion but should receive anti-ischaemic therapy (for example beta blockers, calcium channel blockers and/or nitrates) and following risk stratification, should be considered for early angiography and revascularisation as appropriate if in a high-risk group.

For patients presenting with STEMI, there are national standards for time to reperfusion. Such standards include the following measures of quality of care provided:

- For Thrombolysis: Call-to-Needle time of less than 60 minutes and Door-to-Needle time of less than 30 minutes
- For PPCI: Call-to-Balloon (or intervention) time of less than 150 minutes and Door-to-Balloon (or intervention) time of less than 90 minutes

Hospitals should have a protocol in place to ensure that each patient receives the optimum reperfusion therapy available with the minimum delay according to the clinical scenario.

Ideally all patients should be considered for PPCI but where facilities are unavailable or transit times would be associated with an inherent delay, pre-hospital thrombolysis should be instituted. Only in rare cases should thrombolysis administration be delayed until hospital admission. Patients having PPCI are transported immediately to a regional centre. Patients receiving thrombolysis should be considered for early transfer to an invasive centre undertaking angiography and revascularisation.

References

2 Cardiac Networks Coordinating Group, (2009) Wales Quality Requirements in support of The National Service Framework for Cardiac Disease, Cardiff
Improving Acute Coronary Syndromes care

Driver Diagram

Content Area

Drivers

Interventions

**All ACS**
- Cardiopulmonary Resuscitation, including defibrillation, within 8 minutes, where indicated.
- Undertake Initial Assessment, including 12 lead ECG, in ambulance.
- Start aspirin, in addition to oxygen and analgesics, in ambulance.

**STEMI**
- Pre-alert receiving hospital (+ telemetry) and transport for primary PCI or give thrombolysis within 60 minutes call-to-needle time.

**NSTE MI/UA**
- Transport to hospital cardiac assessment area for monitoring and risk stratification according to Network guidelines.

**All ACS**
- Risk factor assessment and begin cardiac rehabilitation during inpatient period.

**STEMI**
- Undertake angiography ± revascularisation within 24 hours if in higher risk or intermediate risk groups, by transfer where appropriate.

**NSTE MI/UA**
- Undertake angiography ± revascularisation within 96 hours if in higher risk or intermediate risk groups, by transfer where appropriate.

**ALL ACS**
- Discharge on (a) aspirin (b) statin (c) beta blocker.

ACS includes:
- STEMI: ST elevation myocardial infarction.
- NSTEMI: non-ST elevation myocardial infarction.
- UA: unstable angina.

Timely management and treatment of acute chest pain to reduce patient morbidity and mortality.

Rapid Assessment Bundle

Continuing Inpatient Monitoring Bundle

www.1000livesplus.wales.nhs.uk
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 D for further information.

Do you know how you will measure outcomes?

For this programme area, you should use the following outcome measures:

- Reduction in length of stay from STEMI, NSTEMI or UA
- Reduction in 30-day readmission rates with STEMI, NSTEMI or ACS (UA)
- Compliance with the relevant 1000 Lives Plus ACS driver diagram bundle

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 programme 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.

Work through each intervention in your programme area using the following:

a) Apply MFI (Model for Improvement)
b) Use local examples of successes and provide contact details for the teams
c) Critical success factors / top ten tips
d) How to engage the patient in this intervention
e) FAQs

You may find that c - e are best approached as the whole programme area rather than for individual interventions.

Applying the Model for Improvement

How will we know that a change has been an improvement?

You will only know that change is an improvement if you measure. Rather than setting traditional targets the methodology of 1000 Lives Plus is to support teams in improving and making more reliable processes which will inevitably result in improved outcomes. The most common process measure in the ‘Improving Acute Coronary Syndromes Care’ programme is compliance with the care bundles and it can be seen by achieving a high compliance with the bundle the team is demonstrating that it is performing the elements of the bundle reliably.

The percentage compliance is best represented on a run chart which is automatically generated by the 1000 Lives Plus ACS data collection/analysis tool. Run charts are an excellent way of communicating progress visually to the team and should be displayed somewhere prominent where everyone can see it.

The key to successful data collection is to try and make it as easy as possible and this is generally best done by integrating data collection into the normal practice in the clinical area. This does not mean that run charts will be retrospectively audited! The purpose of this work is to make the systems already in place even more efficient and effective.

To measure the percentage compliance, the total number of patients needs to be known to divide the interventions by. For example:

- Risk factor assessment - again, the total number of ACS patients admitted will be known and could be kept on a tally chart. When the patient is risk
assessed the assessment should be recorded as completed, enabling the
percentage compliance for this intervention to be established.

- Begin cardiac rehabilitation during inpatient period - the total number of
ACS patients admitted will be known and could be kept on a tally chart.
The nurse that begins cardiac rehabilitation during the inpatient phase
(known as phase I cardiac rehabilitation) could also keep a tally of the
number of patients s/he has seen. The percentage compliance with this
intervention can then be established.

- For patients with ST-segment elevation MI undertake angiography with/
without revascularisation (if appropriate) within 24 hours if received
thrombolysis, by transfer where appropriate - the total number of
patients with diagnosed STEMI will be known and recorded and the
number that meet the 24 hour target should also be recorded. The
percentage compliance with this intervention can then also
be established.

An exemplar run chart may look like this:
Driver: Rapid Assessment Bundle

Generally, patients transported with chest pain should initially be managed under the assumption that the pain is ischaemic in origin. Pre-hospital interventions should be guided by the nature of the presentation, individual risk factors, and associated symptoms (e.g. cardiopulmonary arrest, breathing difficulty, and other haemodynamic or rhythm instability). Airway, breathing, and circulation should be rapidly assessed with institution of CPR, including defibrillation, or other measures as indicated for the unstable patient.

- Obtain intravenous access
- Administer supplemental oxygen
- Give aspirin (300 mg) at the site
- Administer sublingual GTN if chest pain is ongoing and is believed to be cardiac in origin
- Perform 12 lead ECG and fill out questionnaire.

For STEMI:

- Pre-alert receiving hospital ± telemetry
- Transport for PPCI according to agreed local protocols or administer pre-hospital thrombolysis if patient presentation fits criteria and if PPCI not available.

Measures:

For this intervention, use the following process measures in regions where applicable:

- Percentage of patients suitable for Primary PCI transported to the Regional Cardiac Centre.
- Percentage of patients with STEMI receiving primary percutaneous coronary intervention with a call to balloon time of less than 150 minutes.
- Percentage of patients suitable for thrombolysis receiving it within 60 minutes call-to-needle time.

These measures reflect the combined performance of the Ambulance Service, GPs (where applicable) and the Hospital and are the most relevant overall indicators of care for STEMI patients (MINAP, 2009).
**For NSTEMI/ACS:**

- Transport to hospital cardiac assessment area for monitoring and risk stratification according to Cardiac Network guidelines.

**Measures:**

For this intervention, use the following process measure:

- Percentage of NSTEMI/ACS patients receiving monitoring and risk stratification according to NICE Guidelines.

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**Tips on Improving Call-to Needle Times**

Over recent years the Cardiac Networks have worked with individual organisations to improve the Call-to-Needle times for patients receiving thrombolysis. This has taken the form of support in collaborative audit, individual case review, monitoring and working with MINAP. During 2008/09 the CNCG undertook visits to selected trusts, sometimes with the Delivery and Support Unit (DSU) and produced individual Trust reports as well as a ‘Top Tips’ document: “Improving Performance in the Delivery of Call to Needle Times (CTN) Good Practice Top Tips”. See helpful resources number 5.

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**In Hospital Processes and Outcomes of Care**

The goals of emergency care of ACS patients are:

- Rapid identification of patients with STEMI who have not received pre-hospital thrombolysis. Brief focused assessment with initiation of appropriate reperfusion therapy without further delay.

- In general, obtain intravenous access, administer supplemental oxygen, undertake a 12-lead ECG and provide telemetry monitoring if these procedures have not already been accomplished in the pre-hospital phase.

- For NSTEMI and UA patients, ie those without ST-segment elevation on the ECG, complete a history and physical examination, and risk stratify.

- Perform frequent reassessment of vital signs and symptoms in response to administered therapies.

- Serial ECGs and continuous ST-segment monitoring should be undertaken.

- Patients should undergo cardiac monitoring in an appropriately staffed and equipped area.

- Medical therapy, including antithrombins and antiplatelet agents, should be commenced.
Intervention: Risk Assessment

Patients with NSTEMI or UA are a very heterogeneous population, with varying risks of early and long-term adverse events. Early risk stratification at admission is essential for appropriate early management.

Once the diagnosis of ACS is made the risk of future cardiovascular events should be made using an established risk scoring system that predicts mortality such as the GRACE Risk Score (NICE). The GRACE risk score is recommended as the preferred classification to apply on admission and at discharge in daily clinical routine practice. Further information can be found in helpful resources number 4.

**Measures:**

For this intervention, use the following process measure:

- The percentage of patients with documented assessment of risk in the medical record.

**References**


Driver: Continuing Inpatient Monitoring Bundle

All ACS Intervention
Patients should have risk factor assessment and begin cardiac rehabilitation during the inpatient period.

Measures:
For this intervention, use the following process measure:
- Percentage of patients having risk factor assessment
- Percentage of patients having early cardiac rehabilitation while in hospital.

STEMI Intervention
Angiography ± revascularisation within 24 hours if received thrombolysis (by transfer where appropriate).

Measures:
For this intervention, use the following process measure:
- Percentage of patients with STEMI receiving angiography ± revascularisation within 24 hours where thrombolysis has been received.

NSTEMI/ACS Intervention
Angiography ± revascularisation within 96 hours if intermediate or higher risk groups (by transfer where appropriate).

Measures:
For this intervention, use the following process measure:
- Percentage of patients with diagnosis of NSTEACS who are stratified as intermediate or high risk who receive angiography ± revascularisation within 96 hours.

Overall Measure:
- Percentage compliance with continuing inpatient monitoring bundle.
The Role of Primary Care

MINAP produced a comparison report, at the request of the Welsh Government, examining delays in thrombolysis in Wales, using 2005/06 data. The data showed that the longer delays to treatment sometimes involved patients who had called their GP. Since 2008, the former Mid & South West Wales Cardiac Network has worked with the British Heart Foundation (BHF) as part of their Chest Pain Programme and recently completed implementing a project to reduce delays in patient treatment when attempts were made to access the primary care system. The project focused on:

- Training primary care staff to correctly redirect patients to the emergency services utilising pathways developed by the Cardiac Network in conjunction with the BHF
- Educating the general public with widely-distributed posters and leaflets

Health boards may wish to use the resources to facilitate optimal management of patients presenting with chest pain in primary care to limit delays in patients receiving evidence based interventions. Resources are available through the South Wales Cardiac Network - swcn@wales.nhs.uk. See helpful resources 1 and 2.

Primary and secondary prevention aimed at reducing risk factors (blood pressure, smoking, cholesterol, etc) lead to clinically and statistically significant reductions in morbidity and mortality.

Antiplatelet Therapy

- The benefits of long-term aspirin in all patients with acute coronary syndrome (ACS) are well established. Following a bolus dose low dose daily aspirin (75mg) should be taken indefinitely by all patients unless contra-indicated.
- Dual antiplatelet therapy with aspirin and clopidogrel has a robust evidence base. Clopidogrel should be given as a bolus dose and then at 75mg daily in the majority of patients. The All Wales Medicines Strategy Group (AWMSG) has provided guidance on combination therapy as well as duration of treatment in differing clinical circumstances.

**Measures:**

For this intervention, use the following process measure:

- Percentage of patients with diagnosis of ACS, including STEMI, prescribed aspirin where not contraindicated.

Beta-blocker therapy

Long-term therapy is recommended in patients with ACS, including STEMI.

**Measures:**

For this intervention, use the following process measure:

- Percentage of patients with diagnosis of ACS, including STEMI, prescribed a betablocker where not contraindicated.
**Statin Therapy**

Statin therapy is recommended for adults with clinical evidence of CHD. Treatment for the secondary prevention of CHD should be initiated with simvastatin 40 mg. If there are potential drug interactions, or simvastatin 40 mg is contraindicated, a lower dose or alternative preparation such as pravastatin may be chosen.

In people taking statins for secondary prevention, consider increasing to simvastatin 80 mg or a drug of similar efficacy and acquisition cost if a total cholesterol of less than 4 mmol/litre or an LDL cholesterol of less than 2 mmol/litre is not attained. Any decision to offer a higher intensity statin should take into account informed preference, comorbidities, multiple drug therapy, and the benefit and risks of treatment.

**Measures:**

For this intervention, use the following process measure:

- Percentage of patients with ACS, including STEMI, receiving statin therapy (where not contraindicated).

Measurement of compliance with outcome and process measures and improvements made within the GP Practice Setting may be determined by interrogation of Practice IT systems.

It is recognised that ACE inhibitors and clopidogrel are also essential therapies in ACS patients and future extensions of this programme area may enable these to be included.

**References**

Helpful resources

1. Pathway to assist primary care clinical staff in their management of patients with suspected ACS emphasising an expeditious transfer to hospital by ambulance

Acute Chest Pain Management (Clinical)

**History**
- Patient complains of acute chest pain

**Patient may complain of associated symptoms**

**Associated Symptoms**
- Shortness of breath
- Nausea/vomiting
- Sweating
- Feeling light-headed
- Pallor

**Ask Patient:**
- Character/severity/position/radiation of pain
- Time of onset
- Is pain continuous?
- Factors relieving pain
- Past history of similar pain
- Risk Factors
- Related to activity or exercise?
- Is pain related to trauma/injury?

**Further History**
- Call emergency services and upgrade call to 999

**Examination**
- General appearance - pale/palpitations/cyanosed
- Vital signs - Pulse/BP/Respirations/O2 Saturation/JVP
- Auscultate chest
- Abdominal examination - for suspected aeurysm
- ECG

**Examination should not delay transport of patient to secondary care**

**Diagnosis of acute coronary event**

**Treatment**
- Aspirin 100mg
- Oxygen
- GTN spray
- Opiate analgesia/antiemetic
- If IV already called, call ambulance.

**Emergency Support Equipment** (where available):
- Defibrillator
- Oxygen
- Suction
- Airway
- Bag Valve Mask

Remember:
For every minute delay in thrombolytic treatment 11 days survival is lost
Improving Acute Coronary Syndromes Care

Rheolaeth Poen y Frest Llym –
Cychwyniad Cyflym (Clinigol)

Hanes
Maer claf yn cwyno o boen y frest llym

Efallai bydd y claf yn cwyno o symptomau cysylltiol

Symptomau Cysylltiol
- Diffyg Anadl
- Gyfoga a Chwydu
- Chwylydd
- Pendra
- Gwrafedd

Symptomau Cysylltiol

Gofynnwch i’r Claf:
- Nodweddiau Llynocfenedig
- Reolaid olygfa o boen
- Amser cychwyn
- Y byd lewir yn paenau?
- Ffactorsau y byd cerfiodwy o boen
- Ffactorsau y boen ddebyg
- Ffactorsau Risi
- Y byd lewir yn berthnasol i’w diwydiennod
- Gweithgareithiau ar un ffurf

Factorsau Risi
- Ymygu
- Cofrestru Lliwiau
- Prifiogwn Gwaed
- Gerddi
- Gerddi
- Triniaeth
- Cymorth Argyfwng

Archwiliad
- Gorchfyngeddir – gwerthwyd y cefn y croen
- Arnyddol bynydd – curod y Twf
- Gwerthfynod
- Gwerthfynod
- Gweithgareithiau
- Gweithgareithiau

Triniaeth
- Aspirin 300mg
- Ocigen
- Chwilio G3H
- Analgesia cysgan gyda chwylydd
- Os nad yw'r amblydd weddol o ddiwedd y ffrwyth

Cofiwch:
Am bob munud o oediyn rhiniaeth thrombolytic, mae 11 diurmod o croesiad yn cael eu colli

Rhwydwaith y Galon Canolbarth a De-Ortlinewy Cymru
Mid and South West Wales Cardiac Network

www.1000livesplus.wales.nhs.uk
2. Pathway to assist primary care non-clinical staff in their management of patients with suspected ACS emphasising an expeditious transfer to hospital by ambulance

Acute Chest Pain Patient Management

Patient complains of chest pain or discomfort and/or has collapsed

**Telephone**

- If patient is alone
  - Ask for brief details (name, DOB, address)
  - Note date/time
  - Transfer the call to a doctor or nurse immediately

- Dial 999 and ask for ambulance for chest pain to attend at patient’s address

**In practice**

- Somebody is with the patient
  - Ask for brief details of patient (name, DOB, address)
  - Ask caller to redial 999

- Call 999 then alert doctor or nurse immediately

  - Sit patient down
  - Reassure help is on the way
  - Stay with patient until help arrives

Remember:
For every minute delay in thrombolytic treatment 11 days survival is lost
Poen y Frest Llyn – Cychwyniad Cyflym Rheolaeth y Claf

Mae'r claf yn cwyno o boen y frest neu anghysur a/neu wedi ymollwng

Ffôn

Yn y Feddygfa

Os yw'r claf ar ben ei hunan

Mae rhywun gyda'r claf

• Gofynnwch am fanylion (Erw, Dyddiad Geni, Cysylltiad)
• Nodwch dyddiad ac amser
• Trosglwyddwch yr aildwed i feddyg neu nyrs ar unwaith

• Ffoniwch 999
• Gofynnwch unghywan i chwilio am feddyg neu nyrs ar unwaith

Ffoniwch 999 a gofynnwch am ambeliâns i boen y frest i fynd i gyfeiriad y claf

• Eisteddch y claf i lawr
• Dywedwch wrth y claf fod help ar y ffonid
• Arhoswch gyda'r claf tan fydd y help yn cyrraedd

Dyweddwr y meddyg am yr aildwad

Cofiuch:
Am bob munud o eidi thrombolytic, mae 11 diwrnod o oresiad dd i coel eu colli
3. Clinical Pathway for the Out-of-Hospital Management of Acute Cardiac Chest Pain by the Welsh Ambulance Services NHS Trust

4. Risk Stratification

South East Wales Cardiac Network

Clinical Pathway for the Out-of-Hospital Management of Acute Cardiac Chest Pain

CHD NSF Key Action 18

Welsh Ambulance Services NHS Trust Guideline to Facilitate Early Thrombolysis (CP3)

On arrival at scene, Paramedics will assess and treat the patient as per WAST protocol for management of Cardiac Chest Pain.

- Oxygen, Aspirin, GTN, IV analgesia
- 12 lead ECG

Transfer patient to Ambulance and pre-alert receiving hospital

A.S.H.I.C.E*

En-route to hospital, determine if patient meets criteria for Pre-hospital thrombolysis (18 CRITERIA)

YES

Gain consent as per WAST protocol

Thrombolysis Patient

- Ensure patent IV
- Monoparin 4000 units
- 5ml 0.9% saline flush
- Tenecteplase to WAST protocol

On arrival at Hospital handover to receiving staff to include copies of the patients 12 lead ECG, PCR and 18 question criteria.

NO

Continue transport to receiving hospital

*A.S.H.I.C.E is an acronym for the WAST standard pre-alert message for Age, Sex, History, Injury, Condition, E.T.A.
4. Risk Stratification

NICE specifies key priorities for implementation for the early management of unstable angina and non-ST-segment-elevation myocardial infarction, one of which states “As soon as the diagnosis of unstable angina or NSTEMI is made, and aspirin and Antithrombin therapy have been offered, formally assess individual risk of future adverse cardiovascular events using an established risk scoring system that predicts 6-month mortality (for example, Global Registry of Acute Cardiac Events [GRACE]).”

The GRACE risk scores are based upon a large, unselected population of an international registry of the full spectrum of ACS patients. The risk factors were derived with independent predictive power for in-hospital deaths and post-discharge deaths at 6 months.

The risk factors at admission (in-hospital/to 6 months) include:
- Age (years)
- Heart Rate (bpm)
- Systolic Blood Pressure (mmHg)
- Serum Creatinine level (mg/dL)
- Killip Classification (Class I-IV)
- Cardiac arrest at admission
- ST-segment deviation
- Elevated cardiac enzymes/markers

The risk factors at discharge (to 6 months) include:
- Age (years)
- Heart Rate (bpm)
- Systolic Blood Pressure (mmHg)
- Serum Creatinine level (mg/dL)
- Congestive Heart Failure
- In-hospital PCI
- In-hospital CABG
- Past history of MI
- ST-segment depression
- Elevated cardiac enzymes/markers

The GRACE calculator can be found online at http://www.outcomes.org/grace.
References


2 European Society of Cardiology, (2007) The Task Force for the Diagnosis and Treatment of Non-ST-Segment Elevation Acute Coronary Syndromes


5. Good Practice Top Tips

Improving Performance in the Delivery of Call to Needle Times (CTN) Good Practice Top Tips (Welsh Government, 2008)

1. The Ambulance Service should respond to Category A calls where the chief complaint is chest pain with an ambulance crew comprising at least one paramedic (Paramedics can obtain a 12-lead ECG which is the mainstay of diagnosis in STEMI, and also undertake pre-hospital thrombolysis (PHT) to appropriate patients).

2. Patients should receive timely reperfusion therapy. At present the majority will receive PHT, but Primary PCI is the therapy of choice, pathways should be developed and disseminated to show where this service is available. PHT is given by paramedics under agreed protocols; the earlier PHT is given the better the outcome.

3. The Ambulance Service should pre-alert the agreed receiving unit according to protocol.

4. There should be one receiving unit and one ACS Care pathway for the whole hospital. The receiving unit should facilitate the immediate administration of thrombolysis.

5. Dedicated experienced staff should be made available 24/7 to make decisions regarding in-hospital thrombolysis to prevent delays in management.

6. To reduce delay there should be clear, unambiguous and readily available guidelines to staff which is visible within the receiving unit and to hospital and ambulance staff.

7. If the ambulance ECG is sufficient the decision to thrombolise should not be delayed by repeating an in-hospital 12-Lead ECG.

8. In emergency departments there should be clear guidelines on the recognition and management of patients self-presenting with chest pain.

9. Patients with chest pain should ring emergency telephone numbers directly rather than contact their primary care provider.

10. A patient clinical record (PCR) should be completed by ambulance crew and incorporated into the hospital clinical record. (This will enable data to be entered into MINAP and provide evidence of performance against the AOF).

11. There should be regular reviews of data received from MINAP undertaken by the whole team managing STEMI patients (including emergency department/CCU and general medical staff as appropriate); of particular relevance those failing to meet targets. This process may lead to key learning points for future care improvement.

12. Cardiac networks should arrange regular meetings between hospital staff and the Ambulance service to ensure swift implementation of actions arising from audit meetings.

13. There should be a rolling program of training for staff involved in the thrombolysis pathway which should also include 12-Lead ECG.
Appendices

Appendix A - Measures and Definitions

<table>
<thead>
<tr>
<th>Measure</th>
<th>Definition and Guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction in mortality from CHD by health board area.</td>
<td>All mortality from CHD by health board area, further divided into local authority areas.</td>
</tr>
<tr>
<td>Reduction in mortality from CHD by hospital.</td>
<td>All mortality from CHD within acute hospitals by health board area.</td>
</tr>
<tr>
<td>Reduction in 30 day readmission rates with STEMI, NSTEMI or UA.</td>
<td>All 30 day readmission rates with ACS following a previous admission with ACS to any hospital.</td>
</tr>
<tr>
<td>Percentage of patients suitable for Primary PCI transported to the Regional Cardiac Centre.</td>
<td>Patients who receive primary PCI at Regional Cardiac Centre as a percentage of the total number of STEMI patients diagnosed in the region annually.</td>
</tr>
<tr>
<td>Percentage of patients with STEMI receiving primary percutaneous coronary intervention with a call to balloon time of less than 150 minutes.</td>
<td>Call to balloon times entered into BCIS national registry (CCAD).</td>
</tr>
<tr>
<td>Percentage of patients suitable for thrombolysis receiving it within 60 minutes call-to-needle time.</td>
<td>Call to needle time entered into MINAP national registry (CCAD).</td>
</tr>
<tr>
<td>Percentage compliance with continuing inpatient monitoring bundle.</td>
<td>1. Determine the numerator: the number of patients, identified as compliant with the continuing in one day.</td>
</tr>
<tr>
<td></td>
<td>2. Determine the denominator: all patients, identified as requiring the inpatient monitoring bundle in that day.</td>
</tr>
<tr>
<td></td>
<td>3. Calculate the bundle compliance as a percentage by dividing the numerator by the denominator and multiplying by 100.</td>
</tr>
<tr>
<td>Percentage of patients with diagnosis of NSTEACS who are stratified as intermediate or high risk who receive angiography ± revascularisation within 96 hours.</td>
<td>Stratification should be based on NICE guidance.</td>
</tr>
<tr>
<td>Percentage of patients with STEMI receiving angiography ± revascularisation within 24 hours where thrombolysis has been received.</td>
<td>Data entered into Wales’ angiography database.</td>
</tr>
<tr>
<td>Measure</td>
<td>Definition and Guidance</td>
</tr>
<tr>
<td>---------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Percentage of patients having risk factor assessment and early cardiac rehabilitation while in hospital.</td>
<td>Data entered into NACR national registry.</td>
</tr>
<tr>
<td>The percentage of patients with documented assessment of risk in the medical record.</td>
<td>Data from hospital medical record.</td>
</tr>
<tr>
<td>Transport to hospital cardiac assessment area for monitoring and risk stratification according to Cardiac Network guidelines.</td>
<td>Stratification should be based on NICE guidance.</td>
</tr>
<tr>
<td>Percentage of patients with ACS placed on prophylactic aspirin initiated prior to discharge for whom this treatment is appropriate.</td>
<td>Data entered into MINAP national registry (CCAD).</td>
</tr>
<tr>
<td>Percentage of patients with ACS receiving beta-blockers within 24 hours of arrival and prior to discharge for whom this treatment is appropriate.</td>
<td>Data entered into MINAP national registry (CCAD).</td>
</tr>
<tr>
<td>Percentage of patients with ACS receiving statin agent within 24 hours of arrival and prior to discharge for whom this treatment is appropriate.</td>
<td>Data entered into MINAP national registry (CCAD).</td>
</tr>
<tr>
<td>Percentage of patients with diagnosis of ACS, including STEMI, prescribed aspirin where not contraindicated.</td>
<td>Data entered into MINAP national registry (CCAD).</td>
</tr>
<tr>
<td>Percentage of patients with diagnosis of ACS, including STEMI, prescribed a beta blocker where not contraindicated.</td>
<td>Data entered into MINAP national registry (CCAD).</td>
</tr>
<tr>
<td>Percentage of patients with ACS, including STEMI, receiving statin therapy (where not contraindicated).</td>
<td>Data entered into MINAP national registry (CCAD).</td>
</tr>
</tbody>
</table>
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 uncoordinated 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, assuring 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 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 42. 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.
To deliver patient safety and quality initiatives for Health Boards and Trusts

**Aim**

**Primary drivers**

- **Will**
  - To deliver patient safety and quality initiatives for Health Boards and Trusts

**Secondary drivers**

- **Ideas**
  - Evidence Base (The what to)

**Interventions**

- **Execution Improvement Methodology (The how to)**
  - 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
  - PDSA cycles: Test - implement - spread - sustain

**Establish reliable process**

**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?
**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

For more guidance on using the Model for Improvement, see the ‘How to Improve’ guide.
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 43 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:

<table>
<thead>
<tr>
<th>Plot data over time</th>
<th>- Tracking a few key measures over time is the single most powerful tool a team can use.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seek usefulness, not perfection</td>
<td>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.</td>
</tr>
<tr>
<td>Use sampling</td>
<td>Sampling is a simple, efficient way to help a team understand how a system is performing.</td>
</tr>
<tr>
<td>Integrate measurement into the daily routine</td>
<td>Useful data is often easy to obtain without relying on information systems.</td>
</tr>
<tr>
<td>Use qualitative and quantitative data</td>
<td>In addition to collecting quantitative data, be sure to collect qualitative data, which is often easier to access and highly informative.</td>
</tr>
<tr>
<td>Understand the variation that lives within your data</td>
<td>Don’t over-react to a special cause and don’t think that random movement of your data up and down is a signal of improvement.</td>
</tr>
</tbody>
</table>
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.
## Appendix D - Glossary

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>ACE-I</td>
<td>Angiotensin-Converting Enzyme Inhibitors</td>
</tr>
<tr>
<td>ACS</td>
<td>Acute Coronary Syndrome</td>
</tr>
<tr>
<td>BCIS</td>
<td>British Cardiovascular Intervention Society</td>
</tr>
<tr>
<td>CABG</td>
<td>Coronary Artery Bypass Graft</td>
</tr>
<tr>
<td>CCAD</td>
<td>Central Cardiac Audit Database</td>
</tr>
<tr>
<td>CHD</td>
<td>Coronary Heart Disease</td>
</tr>
<tr>
<td>CNCG</td>
<td>Cardiac Networks Coordinating Group</td>
</tr>
<tr>
<td>CPR</td>
<td>Cardiopulmonary Resuscitation</td>
</tr>
<tr>
<td>ECG</td>
<td>Electrocardiogram</td>
</tr>
<tr>
<td>GRACE</td>
<td>Global Registry of Acute Coronary Events</td>
</tr>
<tr>
<td>GTN</td>
<td>Glyceryl Trinitrate</td>
</tr>
<tr>
<td>MINAP</td>
<td>Myocardial Ischaemia National Audit Project</td>
</tr>
<tr>
<td>NACR</td>
<td>National Audit of Cardiac Rehabilitation</td>
</tr>
<tr>
<td>NSF</td>
<td>National Service Framework</td>
</tr>
<tr>
<td>NSTEACS</td>
<td>Non-ST-segment Elevation Acute Coronary Syndromes</td>
</tr>
<tr>
<td>NSTEMI</td>
<td>Non-ST-segment Elevation Myocardial Infarction</td>
</tr>
<tr>
<td>PCI</td>
<td>Percutaneous Coronary Intervention</td>
</tr>
<tr>
<td>PHT</td>
<td>Pre-hospital Thrombolysis</td>
</tr>
<tr>
<td>PPCI</td>
<td>Primary Percutaneous Coronary Intervention</td>
</tr>
<tr>
<td>QRs</td>
<td>Quality Requirements</td>
</tr>
<tr>
<td>STEMI</td>
<td>ST-segment Elevation Myocardial Infarction</td>
</tr>
<tr>
<td>UA</td>
<td>Unstable Angina</td>
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</tbody>
</table>
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