Chest Pain Evaluation (NSW Chest Pain Pathway)

Document Number PD2011_037
Publication date 09-Jun-2011
Functional Sub group Clinical/ Patient Services - Governance and Service Delivery
Clinical/ Patient Services - Medical Treatment
Summary The Policy outlines the minimum standards for the management of patients presenting with Chest Pain or other symptoms of myocardial ischaemia.

NOTE: This Policy also applies to Local Health Networks until Local Health Districts commence on 1 July 2011.

Author Branch Agency for Clinical Innovation
Branch contact Agency for Clinical Innovation
Audience All staff involved in the management and risk stratification of patients who present with chest pain
Distributed to Public Health System, Divisions of General Practice, Government Medical Officers, Health Associations Unions, NSW Ambulance Service, Ministry of Health, Tertiary Education Institutes
Review date 09-Jun-2016
Policy Manual Patient Matters
File No.
Status Active

Director-General
This Policy Directive may be varied, withdrawn or replaced at any time. Compliance with this directive is mandatory for NSW Health and is a condition of subsidy for public health organisations.
IMPLEMENTATION OF MINIMUM STANDARDS FOR CHEST PAIN EVALUATION (NSW CHEST PAIN PATHWAY)

PURPOSE

The policy mandates the implementation of minimum standards for chest pain evaluation, by all hospitals in the NSW Health system for patients presenting to Emergency Departments with chest pain. Compliance with these minimum standards for chest pain evaluation will improve the management of patients by guiding clinicians through risk stratification and outlining the best practice management. Facilities may continue to use existing local Pathways provided that they meet all of the minimum standards and are in active use in emergency departments.

Facilities who do not use an existing Chest Pain Pathway that meets the minimum standards must implement the standard NSW Chest Pain Pathway. The NSW Chest Pain Pathway aligns with the National Heart Foundation/Cardiac Society of Australia and New Zealand Guidelines for the management of acute coronary syndromes.

MANDATORY REQUIREMENTS

1. All facilities with Emergency Departments must have and use a pathway that meets the following minimum standards for chest pain patients:
   - Assigns triage category 2
   - Includes risk stratification
   - ECGs are taken and reviewed
   - Troponin levels are taken and reviewed
   - Vital signs are taken and documented
   - Critical times are documented (symptom onset, presentation)
   - Aspirin is given, unless contraindicated
   - A Senior Medical Officer is assigned to provide advice and support on chest pain assessment and initial management, 24/7
   - A nominated Cardiologist is assigned to provide advice on further management 24/7
   - The pathway gives instruction regarding atypical chest pain presentations
   - High risk alternate diagnosis listed for consideration e.g. Aortic Dissection, Pulmonary Embolism & Pericarditis.
   - Sites that do not have 24/7 PCI capability must have Thrombolysis as the default STEMI management strategy unless there is an existing documented system for transfer.

2. All facilities who do not use an existing Chest Pain Pathway that meets the minimum standards must implement the standard NSW Chest Pain Pathway that matches their facility (i.e. only sites that can provide 24/7 Primary PCI are able to use the Primary PCI site Pathway) as the minimum standard.
IMPLEMENTATION

ROLES AND RESPONSIBILITIES

NSW Department of Health:
- Review the minimum standards of a Chest Pain Pathway in line with relevant national guidelines and best practice evidence.
- Develop and make accessible implementation support tools.
- Evaluate Chest Pain Pathway implementation and performance against the minimum standards across the NSW Health system.

LHN Chief Executives:
- Ensure effective implementation of the minimum standards for chest pain evaluation in all LHN Emergency Departments
- Report minimum standards for chest pain evaluation implementation to the LHN Governing Council
- Report Chest Pain Pathway implementation and performance against the minimum standards to NSW Department of Health as requested

LHN Directors of Clinical Governance:
- Direct a LHN gap analysis against the chest pain evaluation minimum standards
- Develop and lead implementation strategy
- Coordinate appropriate educational resources for clinicians
- Evaluate LHN Chest Pain Pathway implementation and performance against the minimum standards
- Investigate RCA incidents relating to the minimum standards for chest pain evaluation

Facility General Managers and Heads of Cardiology and Emergency Departments:
- Direct a local gap analysis against the chest pain evaluation minimum standards
- Implement the chest pain evaluation minimum standards locally
- Evaluate and monitor local implementation and performance against the chest pain evaluation minimum standards
- Coordinate local education requirements for clinicians
- Coordinate local rostering to ensure that a senior clinician is available to assist 24/7 as per the chest pain evaluation minimum standards or utilise documented referral network

Clinicians:
- Comply with the minimum standards of chest pain evaluation
- Escalate management of deteriorating patients as per Between the Flags (PD2010_026)
- In Emergency Departments that do not have a medical officer accessible 24/7, it will be necessary to implement processes where the nurse in charge of the ED signs the Chest Pain Pathway form in place of the medical officer.
REVISION HISTORY

<table>
<thead>
<tr>
<th>Version</th>
<th>Approved by</th>
<th>Amendment notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 2011 (PD2011_037)</td>
<td>Dr Tim Smyth, Deputy Director-General, HSQPID</td>
<td>New Policy</td>
</tr>
</tbody>
</table>

ATTACHMENTS

1. NSW Chest Pain Pathway: Primary PCI Site
2. NSW Chest Pain Pathway: Non Primary PCI Site
### CHEST PAIN PATHWAY

**PRIMARY PCI SITE**

**CHEST PAIN or OTHER SYMPTOMS of MYOCARDIAL ISCHAEMIA**

- Acute Coronary Syndrome
- First Medical Contact
- Electrocardiogram
- Senior Medical Officer
- Percutaneous Coronary Intervention
- Left Ventricular Hypertrophy

**ECG & Vital Signs, expert interpretation within 10 minutes**

**ST ELEVATION or (presumed new) LBBB**

- Consider Aortic Dissection
- Consider Pulmonary Embolism

**Diagnose NON ST ELEVATION ACUTE CORONARY SYNDROME (ACS)**

- Go immediately to STEMI MANAGEMENT (page 3)

**STRATIFY ACS RISK**

**HIGH RISK**
- Any of the following and no high risk features
  - ACS symptoms which occurred at rest, or were repetitive or prolonged (but currently resolved)
  - Previous PCI/CABG > 6 months
  - Known coronary heart disease
  - Two or more risk factors of: Hypertension, family history, active smoking or hyperlipidaemia
  - Chronic renal failure (especially if known GFR < 60 ml/min)
  - Diabetes + atypical ACS symptoms
  - Age > 65 years

**INTERMEDIATE RISK**
- Any of the following and no high or intermediate risk features
  - Persistent or dynamic ECG changes of: ST depression ≥ 0.5 mm or new T wave inversion ≥ 2 mm or transient ST elevation (≥ 0.5 mm) in more than two contiguous leads or sustained VT
  - ECG is not normal and has changed from previous pain free ECG but does not contain high risk changes.

**LOW RISK**
- Presentation with clinical features consistent with ACS without intermediate-risk or high-risk features.

All cases to be discussed with Senior Medical Officer

This tool is intended as a guideline for clinicians to provide quality patient care. It is not intended, nor should it replace, individual clinical judgement. Some patients with comorbidities or patients not suitable for invasive investigations may be appropriately managed medically.

---

**Contraindications and cautions for thrombolysis use in STEMI**

**Absolute contraindications:**
- Active bleeding or bleeding diathesis (excluding menorrhagia)
- Significant closed head or facial trauma within 3 months
- Suspected aortic dissection (including new neurological symptoms)

**Risk of intracranial haemorrhage**
- Any prior intracranial haemorrhage
- Ischaemic stroke within 3 months
- Known structural cerebral vascular lesion (eg, arteriovenous malformation)
- Known malignant intracranial neoplasm (primary or metastatic)

**Relative contraindications:**
- Current use of anticoagulants: the higher the international normalised ratio (INR), the higher the risk of bleeding
- Non-compressible vascular punctures
- Recent major surgery (< 3 weeks)
- Traumatic or prolonged (> 10 minutes) cardiopulmonary resuscitation
- Active peptic ulcer

**Risk of intracranial haemorrhage**
- History of chronic, severe, poorly controlled hypertension
- Severe uncontrolled hypertension on presentation (> 180 mmHg systolic or > 110 mmHg diastolic)
- Ischaemic stroke more than 3 months ago, dementia, or known intracranial abnormality not covered in contraindications

**Other**
- Pregnancy

*Adapted from NHF/CSANZ Guidelines for the management of acute coronary syndromes 2006*
### CHEST PAIN PATHWAY

**PRIMARY PCI SITE**

**CHEST PAIN PATHWAY**

**PRIMARY PCI SITE**

**CHEST PAIN PATHWAY**

**PRIMARY PCI SITE**

### STEMI MANAGEMENT

1. **CONFIRM INDICATIONS for REPERFUSION**
   - [ ] Chest pain > 30 min and < 12 hrs
   - [ ] Persistent ST segment elevation of ≥ 1 mm in two or more contiguous limb leads or ST segment elevation of ≥ 2 mm in two contiguous chest leads or presumed new LBBB pattern
   - [ ] Myocardial infarct likely from history
   - [ ] Time of diagnostic ECG

2. **GENERAL MANAGEMENT**
   - [ ] Cardiac monitoring
   - [ ] ECG
   - [ ] Oxygen
   - [ ] IV Cannula X 2
   - [ ] Nitrates-Sublingual or IV
   - [ ] CXR
   - [ ] Analgesia – Morphine
   - [ ] Beta Blockers
   - [ ] Refer to local protocols &/or Therapeutic Guidelines

3. **ADMINISTER ANTITHROMBOTIC THERAPY**
   - [ ] Aspirin: 300 mg (soluble)
   - [ ] Clopidogrel: 300 - 600 mg (or prasugrel &/or ticlopidine)
   - [ ] Enoxaparin: 30 mg IV then bd (or IV heparin or bivalirudin) 1 mg/kg subcut (Max 100 mg)
   - [ ] Refer to drug protocols &/or Therapeutic Guidelines

4. **CHOOSE REPERFUSION METHOD**
   - [ ] PRIMARY PCI UNLESS
     - [ ] Significant delay to availability of Cath Lab or interventional team
     - [ ] Patient does not consent to primary PCI
     - [ ] History, contrast allergy
     - [ ] Vascular access problems
     - [ ] Discuss with Interventional cardiologist:
       - [ ] Time
     - [ ] Decision regarding reperfusion method:
       - [ ] Time

5. **TRANSFER TO CATH LAB**
   - [ ] OR
     - [ ] THROMBOLYSE if appropriate
       - [ ] No contraindications (see page 4)
       - [ ] Tenecteplase / Reteplose
       - [ ] Body Weight kg Dose ________
     - [ ] Time administered
     - [ ] Repeat ECG at 60 mins post thrombolytic
     - [ ] Discuss further mx with cardiologist
     - [ ] Failure to reperfuse (less than 50% reduction in ST elevation)
     - [ ] Consider Rescue Angioplasty

- [ ] Cath Lab arrival time please use 24 hr Clock
- [ ] On table time
- [ ] First device use time

### MEDICAL OFFICER

- [ ] This tool is intended as a guideline for clinicians to provide quality patient care. It is not intended, nor should it replace, individual clinical judgement. Some patients with co-morbidities or patients not suitable for invasive investigations may be appropriately managed medically.

---

**ANTITHROMBOTIC THERAPY**

- [ ] Antiplatelet therapy
  - [ ] Yes
  - [ ] No

- [ ] Betablocker
  - [ ] Yes
  - [ ] No

- [ ] Anticoagulant
  - [ ] Yes
  - [ ] No

- [ ] Symptomatic treatment of ongoing pain/hypertension
  - [ ] IV GTN (titrate against pain & BP)
  - [ ] IV Morphine

- [ ] Refer to nominated cardiologist for further management

**REPERFUSION**

- [ ] ADMIT or TRANSFER
  - [ ] Continuous cardiac monitoring & frequent vital signs
  - [ ] Repeat ECG immediately if symptoms recur
  - [ ] Repeat ECG 8 hrs post onset of symptoms
  - [ ] Repeat Troponin at 8 hrs if 1st sample negative
  - [ ] ECG/Troponin review by medical officer

- [ ] Discuss Exercise Stress Test ** if :
  - [ ] No further chest pain/symptoms
  - [ ] 2 negative Troponin tests
  - [ ] No new ECG changes
  - [ ] No contraindications to stress test (page 4)

- [ ] Restrify to High Risk if:
  - [ ] Recurrent ischaemic chest pain or
  - [ ] Positive Troponin or
  - [ ] New ECG changes
  - [ ] New ECG test

- [ ] Restrify to Low Risk & Discharge if:
  - [ ] Negative stress test or
  - [ ] Stress test available within 72 hrs** and
  - [ ] No further chest pain/symptoms
  - [ ] Repeat ECG & vital signs, if stable discharge

**NB: ** If stress test is not available within 72 hrs of discharge, treatment plan should be guided by nominated SMO/Cardiologist

**Pharmacological stress test or CT coronary angiography may be indicated**

---

**Recommended Further Management**

Refer to drug protocols &/or Therapeutic Guidelines

---

**Medical Officer:** Print name & sign ____________________ Date ____________

**Medical Officer Designation:** ____________________

This tool is intended as a guideline for clinicians to provide quality patient care. It is not intended, nor should it replace, individual clinical judgement. Some patients with co-morbidities or patients not suitable for invasive investigations may be appropriately managed medically.
**CHEST PAIN PATHWAY**

**NON PRIMARY PCI SITE**

### Date of Presentation

**ECG & Vital Signs, expert interpretation within 10 minutes**

**ST ELEVATION or (presumed new) LBBB**

**Consider Aortic Dissection**

- Back pain, hypertension, absent pulse, BP difference

**Consider Pulmonary Embolism**

- Severe dyspnoea, respiratory distress, low subcutaneous saturation

**Diagnose NON ST ELEVATION ACUTE CORONARY SYNDROME (ACS)**

**STRATIFY ACS RISK**

#### HIGH RISK

- ACS symptoms are repetitive or prolonged (> 10 min) & still present.
- Syncope
- History of chronic left ventricular systolic dysfunction (especially if known LVEF < 40%) or current clinical evidence of LVF.
- Previous PCI/CABG > 6 months
- Diabetes + typical ACS symptoms
- Chronic renal failure + typical ACS symptoms
- Haemodynamic compromise (sustained SBP < 90 mmHg & / or new onset mitral regurgitation)
- Elevated Troponin (consider haemolytic, renal failure)

#### INTERMEDIATE RISK

- ACS symptoms within 48 hrs that occurred at rest, or were repetitive or prolonged (but currently resolved)
- Previous PCI/CABG > 6 months
- Known coronary heart disease: Esp if prior AMI or known coronary lesion > 50% stenosis
- Two or more risk factors of: Hypertension, family history, active smoking or hyperlipidaemia
- Chronic renal failure (especially if known GFR < 60 mL/min) + atypical ACS symptoms
- Diabetes + atypical ACS symptoms
- Age > 65 years

#### LOW RISK

- Presentation with clinical features consistent with ACS without intermediate- risk or high-risk features.

**Go immediately to STEMI MANAGEMENT (page 3)**

### General Management

- Oxygen
- IV Access
- Pain Relief
- Pathology incl Troponin
- Chest X-ray

**Consider Pericarditis**

- Sharp chest pain, respiratory or positional component

**Consider Aortic Dissection**

- Back pain, hypertension, absent pulse, BP difference

### Facility:

- Senior Medical officer
- SMR080.071
- Chest pain pathway
- Location / Ward

### Contraindications and Cautions for Thrombolysis Use in STEMI

#### Absolute contraindications:

- Risk of bleeding
  - Active bleeding or bleeding diathesis (excluding menses)
  - Significant closed head or facial trauma within 3 months
  - Suspected aortic dissection (including new neurological symptoms)

- Risk of intracranial haemorrhage
  - Any prior intracranial haemorrhage
  - Iaemic stroke within 3 months
  - Known structural cerebral vascular lesion (eg, arteriovenous malformation)
  - Known malignant intracranial neoplasm (primary or metastatic)

#### Relative contraindications:

- Risk of bleeding
  - Current use of antiplatelets: the higher the international normalised ratio (INR), the higher the risk of bleeding
  - Non-compressible vascular punctures
  - Recent major surgery (< 3 weeks)
  - Traumatic or prolonged (> 15 minutes) cardiopulmonary resuscitation
  - Recent (within 4 weeks) internal bleeding (eg, gastrointestinal or urinary tract haemorrhage)
  - Active peptic ulcer

- Risk of intracranial haemorrhage
  - History of chronic, severe, poorly controlled hypertension
  - Uncontrolled symptomatic heart failure
  - Uncontrolled cardiac arrhythmias causing symptoms or haemodynamic compromise
  - Ischaemic stroke more than 3 months ago, dementia, or known intracranial abnormality not covered in contraindications

### Other

- Adapted from NHF/CSANZ Guidelines for the Management of Acute Coronary Syndromes 2006

### Contraindications to Exercise Testing (ACC/AHA Guidelines)

#### Absolute

- Recurrent chest pain
- Acute myocardial infarction, within 2 days
- High-risk unstable angina
- Uncontrolled cardiac arrhythmias causing symptoms or haemodynamic compromise
- Symptomatic severe aortic stenosis
- Uncontrolled symptomatic heart failure
- Acute pulmonary embolus or pulmonary infarction
- Acute myocarditis or pericarditis
- Acute aortic dissection

#### Relative

- Critical left main coronary stenosis
- Moderate stenotic valvular heart disease
- Electrolyte abnormalities
- Systolic hypertension > 200 mmHg
- Diastolic hypertension > 100 mmHg
- Tachyarrhythmias or bradyarrhythmias
- New onset atrial fibrillation
- Hypertrophic cardiomyopathy and other forms of outflow obstruction
- Mental or physical impairment leading to the inability to exercise adequately
- High-degree atrioventricular block
- Resting ECG which will make EST interpretation difficult (eg LBBB, LVH with strain, Ventricular pacing, Ventricular preexcitation.)

#### Abbreviations:

- ACS – Acute Coronary Syndrome
- CABG – Coronary Artery Bypass Graft
- ECG – Electrocardiogram
- FMC – First Medical Contact
- GTN – Glyceryl trinitrate
- LBBB – Left Bundle Branch Block
- LVH – Left Ventricular Hypertrophy
- PCI – Percutaneous Coronary Intervention
- SMO – Senior Medical officer
- STEMI – ST Elevation Myocardial Infarction

---

This tool is intended as a guideline for clinicians to provide quality patient care. It is not intended, nor should it replace, individual clinical judgement. Some patients with co-morbidities or patients not suitable for invasive investigations may be appropriately managed medically.
CHEST PAIN PATHWAY

NON PRIMARY PCI SITE

Recommended Further Management

Refer to drug protocols &/or Therapeutic Guidelines

INTERMEDIATE RISK

- Continue monitoring & frequent vital signs
- Repeat ECG immediately if symptoms recur
- Repeat ECG 8 hrs post onset of symptoms
- Repeat Troponin at 8 hrs if 1st sample negative
- ECG/Troponin review by medical officer

- Refer for Exercise Stress Test ** if:
  - No further chest pain/symptoms
  - 2 negative Troponin tests
  - No new ECG changes

- Restrarry to Low Risk & Discharge if:
  - Negative stress test
  - Stress test available within 72 hrs
  - No further chest pain/symptoms

- Regular vital signs
- Repeat ECG immediately if symptoms recur
- Repeat ECG 8 hrs post onset of symptoms
- Repeat Troponin at 8 hrs if 1st sample negative
- ECG/Troponin review by medical officer

- Restrarry Risk if:
  - Recurrent ischaemic chest pain or
  - Positive Troponin or
  - New ECG changes

- If low Risk ACS
  - Discharge
  - Follow up GP/LMO within 3-5 days of D/C
  - Consider Specialist follow up
  - Consider discharge on Aspirin (discuss with SMO)
  - Vital signs prior to discharge

- Symptomatic treatment of ongoing pain/hypertension
- IV GTN (titrate against pain & BP)
- IV Morphine
- Refer to nominated cardiologist for further management

- Pharmacological stress test or CT coronary angiography may be indicated

- NB: ** If stress test is not available within 72 hrs of discharge, treatment plan should be guided by nominated SMo/Cardiologist

- Consider alternative diagnosis

- Exit Pathway

- Consult with cardiologist

- Time administered

- OR

- Transfer to PRIMARY PCI SITE if appropriate

- (As per table below)

Maximum Acceptable Delay from First Medical Contact (FMC):

- Time since symptom onset
- Acceptable delay from FMC to percutaneous intervention
  - <1hr
  - 1-3hrs
  - >3hrs

- Transfer to PCI-capable hospital (as per locally agreed protocol)
- Repeat ECG at 60 mins post thrombolytic

- Discuss further management immediately with nominated cardiologist
- Prioritise urgency of transfer with nominated cardiologist
- Organise transfer to PCI-capable hospital
- Repeat ECG at 60 mins post thrombolytic

- Medical Officer: Print name & sign
- Date

- Medical Officer Designation

- This tool is intended as a guideline for clinicians to provide quality patient care. It is not intended, nor should it replace, individual clinical judgement. Some patients with co-morbidities or patients not suitable for invasive investigations may be appropriately managed medically.