Chest Pain Evaluation (NSW Chest Pain Pathway)

**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.

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**Functional group** Clinical/Patient Services - Governance and Service Delivery, Medical Treatment


**Distributed to** Public Health System, Divisions of General Practice, Government Medical Officers, Health Associations Unions, NSW Ambulance Service, Ministry of Health, Tertiary Education Institutes

**Audience** All staff involved in the management and risk stratification of patients who present with chest pain

Secretary, NSW Health

This Policy Directive may be varied, withdrawn or replaced at any time.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>
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<tr>
<td>June 2011</td>
<td>Dr Tim Smyth, Deputy Director-General, HSQPID</td>
<td>New Policy</td>
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<td>(PD2011_037)</td>
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ATTACHMENTS

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

**PRIMARY PCI SITE**

**Date of Presentation**

**Time**

**Time of Symptom Onset**

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**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 subcutis O2 saturation)

**Diagnose**

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

**STRATIFY ACS RISK**

**HIGH RISK**

- Any of the following and no high risk features
  - ACS symptoms are repetitive or prolonged (> 10 min) & still present.
  - Syncope
  - History of chronic left ventricular systolic dysfunction (especially if known LVF < 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 and / or new onset mitral regurgitation)
  - Elevated Troponin (consider haemolysis, renal failure)

**INTERMEDIATE RISK**

- Any of the following and no low or intermediate risk features
  - 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**

- Any of the following and no high or intermediate risk features
  - Presentation with clinical features consistent with ACS without intermediate- risk or high-risk features.
  - ECG Normal or unchanged from previous pain free ECG

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**General Management**

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

**Consider Pericarditis** (sharp chest pain, respiratory or positional component)

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

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

**Absolute contraindications:**

- 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
  - 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)
- Recent (within 4 weeks) internal bleeding (eg, gastrointestinal or urinary tract haemorrhage)
- Active peptic ulcer

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**Recommended Management on page 2**

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**RECOMMENDED FURTHER MANAGEMENT**

Refer to drug protocols &/or Therapeutic Guidelines

**HIGH RISK**

- 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

**INTERMEDIATE RISK**

- 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

**LOW RISK**

- 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

**ANTIPLATELET THERAPY**

- Yes
- No

If no reason

Discuss with cardiologist (SMO)

**BETABLOCKER**

- Yes
- No

If no reason

**ANTICOAGULANT**

- Yes
- No

If no reason

**SYMPTOMATIC TREATMENT OF ONGOING PAIN/HYPERTENSION**

- IV GTN (titrate against pain & BP)
- IV Morphine
- Refer to nominated cardiologist for further management

**IF A HIGH SENSITIVITY TROPOGIN ASSAY IS USED, THE TESTING INTERVAL MAY BE REDUCED TO 3 HOURS, PROVIDED THE SECOND SAMPLE IS TAKEN AT LEAST 6 HOURS AFTER SYMPTOM ONSET.**

**SmM* 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.

If no reason

**Confirm administration or give:**

- Aspirin (discuss with SMO)
- Enoxaparin 30 mg IV then bd (or IV heparin or bivalirudin) 1 mg/kg subcut (Max 100 mg)

**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:

**CHOOSE REPERFUSION METHOD**

Discuss with Interventional cardiologist:

- Time of diagnostic ECG

**Transfer to Cath Lab**

Discuss with Interventional cardiologist:

- Tenecteplase / Reteplase
- Body weight kg

**Thrombolyste if appropriate**

- 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

**Time to Revascularisation (TIMI 3 flow)**

- Yes / No

**First device use time**

- Time to Cath Lab

Medical Officer: Print name & sign Date

Medical Officer Designation

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CHEST PAIN PATHWAY
NON PRIMARY PCI SITE

Date of Presentation: Time: Time of Symptom Onset:

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 saturations)
Consider: Pericarditis (sharp chest pain, respiratory or positional component)

Diagnose: NON ST ELEVATION ACUTE CORONARY SYNDROME (ACS)

Go immediately to STEMI MANAGEMENT (page 3)

HIGH RISK
Any of the following
- 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 and/or new onset mitral regurgitation)
- Elevated Troponin (consider haemolysis, renal failure)

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

LOW RISK
Any of the following and no high or intermediate risk features
- Presentation with clinical features consistent with ACS without intermediate- risk or high-risk features.

Contraindications and precautions for thrombolysis use in STEMI

Contraindications and precautions 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
- Ischemic stroke within 3 months
- Known structural cerebral vascular lesion (e.g., arteriovenous malformation)
- Known malignant intracranial neoplasm (primary or metastatic)

**Relative contraindications:**
- Risk of bleeding
  - 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
  - Recent (within 4 weeks) internal bleeding (e.g., gastrointestinal or urinary tract haemorrhage)
  - 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)
  - Ischemic 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 atroventricular block
- Resting ECG which will make EST interpretation difficult (e.g. LBBB, LVH with strain, Ventricular pacing, Ventricular preexcitation.)

Abbreviations:

- ACS – Acute Coronary Syndrome
- CABG – Coronary Artery Bypass Graft
- ECG – Electrocardiogram
- FMC – First Medical Contact
- GFR – Glomerular filtration rate
- GTN – Glyceryl trinitrate
- LBBB – Left Bundle Branch Block
- LVF – Left Ventricular Failure
- LVH – Left Ventricular Hypertrophy
- PCI – Percutaneous Coronary Intervention
- STEMI – ST Elevation Myocardial Infarction

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CHEST PAIN PATHWAY

NON PRIMARY PCI SITE

Recommended Further Management

Refer to drug protocols &/or Therapeutic Guidelines

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

2. **GENERAL MANAGEMENT**

- Cardiac monitoring
- Oxygen
- IV Cannula X 2
- Analgesia – Morphine
- Beta Blockers
- Refer to local protocols &/or Therapeutic Guidelines

3. **ADMINISTER ANTITHROMBOTIC THERAPY**

- Aspirin 300 mg (soluble)
- Enoxaparin 30 mg IV then bd (or IV heparin or bivalirudin)
- 1 mg/kg subcut (Max 100 mg)

4. **CHOOSE REPERFUSION METHOD**

- Transfer to PRIMARY PCI SITE if
  - Absolute or unacceptable relative contraindications (see page 4)
  - Patient does not consent to thrombolysis
  - Documented system for transfer to PRIMARY PCI SITE in place
  - Discussed with cardiologist: Time

5. **THROMBOLYSE UNLESS**

- Consider alternative diagnosis

Medical Officer: Print name & sign ________________________________ Date ____________________

Medical Officer Designation __________________________________________

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STEMI MANAGEMENT

Recommendations for STEMI Management

1. **CONFIRM INDICATIONS for REPERFUSION**

- Chest pain > 30 min and < 12 hrs
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