Acute coronary syndromes treatment algorithm

Updated September 2011

Reperfusion therapy for ST segment elevation myocardial infarction (STEMI)

Symptoms consistent with ACS

- Start ECG monitoring
- Insert cannula
- Pain relief
- Blood tests
- Give aspirin 150–300 mg unless already given or contraindicated

Immediate 12-lead ECG

Doctor to see patient within 10 minutes of arrival
(national triage category 2)

Does patient meet indications for reperfusion therapy?
- Persistent ST elevation ≥ 1 mm in 2 contiguous limb leads **or**
- ST elevation ≥ 2 mm in 2 contiguous chest leads **or**
- New left bundle branch block pattern

NO →

Monitor
- Chest pain
- ECG
- Cardiac biomarkers
- Pain relief

Note: the routine use of supplemental oxygen is not recommended. Oxygen therapy is indicated for patients with hypoxia (oxygen saturation < 93%) and where there is evidence of shock.[1]

YES ↓

Symptom onset

< 1 hour ago	1–3 hours ago	3–12 hours ago
PCI available within 1 hour?	PCI available within 90 minutes?	PCI available within 90 minutes (onsite) or 2 hours (offsite, including transport time)?
YES → PCI	YES → PCI	YES → PCI
NO → Fibrinolysis (unless contraindicated*)	NO → Fibrinolysis (unless contraindicated*)	NO → Fibrinolysis (unless contraindicated*)

Patients in whom fibrinolysis is contraindicated, or with ongoing symptoms or instability after fibrinolysis, should be transferred for PCI.

Note
Reperfusion not routinely recommended after 12 hours from symptom onset if the patient is asymptomatic and haemodynamically stable.

* Contraindications for fibrinolysis

Absolute
- Active bleeding or bleeding diathesis (excluding menses)
- Significant closed head or facial trauma within 3 months
- Suspected aortic dissection
- Any prior intracranial haemorrhage
- Ischaemic stroke within 3 months
- Known structural cerebral vascular lesion
- Known malignant intracranial neoplasm

Relative
- Current use of anticoagulants
- Noncompressible vascular punctures
- Recent major surgery (< 3 weeks)
- Traumatic or prolonged (> 10 min) CPR
- Recent internal bleeding (within 4 weeks)
- Active peptic ulcer
- History of chronic, severe, poorly controlled hypertension
- Severe uncontrolled hypertension on presentation (systolic ≥ 180 mmHg or diastolic ≥ 110 mmHg)
- Ischaemic stroke > 3 months ago, dementia or known intracranial abnormality (not covered in 'absolute contraindications')
- Pregnancy

Evolving risk stratification: clinical assessment, troponin assessment and time

Careful clinical history, examination, ECG, chest X-ray and investigations to diagnose other causes of chest pain and evaluate clinical likelihood of evolving ACS*

High-sensitivity troponin test all patients

At presentation	Negative (< 99th percentile)	Positive (≥ 99th percentile)†
3 hours after presentation and at least 6 hours after the onset of symptoms	Repeat troponin	
	Negative	Positive‡ ≥ 99th percentile or ≥ 50% increase
6 hours after presentation		Repeat troponin to evaluate cause of troponin elevation
		Significant change in troponin level§
		No change in troponin level
	Myocardial infarction (MI) unlikely: proceed to early 'rule-out' CAD testing	MI likely: seek cardiac consultation and further investigation
		Not early MI: consider late MI or other causes of chronic troponin elevation

High-risk NSTEACS

Presentation with clinical features consistent with ACS and any of:
- repetitive or prolonged (> 10 minutes) ongoing chest pain/ discomfort
- elevation of at least 1 cardiac biomarker (troponin or CK-MB)
- persistent or dynamic ST depression ≥ 0.5 mm or new T wave inversion ≥ 2 mm
- transient ST segment elevation (≥ 0.5 mm) in more than 2 contiguous leads
- haemodynamic compromise: systolic blood pressure < 90 mmHg, cool peripheries, diaphoresis, Killip class > 1 and/or new onset mitral regurgitation
- sustained ventricular tachycardia
- syncope
- LV systolic dysfunction (LVEF < 40%)
- prior PCI within 6 months or prior CABG surgery
- presence of known diabetes (with typical symptoms of ACS)
- chronic kidney disease – estimated GFR < 60 mL/min (with typical symptoms of ACS).

Intermediate-risk NSTEACS

Presentation with clinical features consistent with ACS and any of:
- chest pain or discomfort within past 48 hours that occurred at rest, or was repetitive or prolonged (but currently resolved)
- age > 65 years
- known CHD: prior MI with LVEF ≥ 40% or known coronary lesion > 50% stenosed
- no high-risk ECG changes (see above)
- two or more of: known hypertension, family history, active smoking or hyperlipidaemia
- presence of known diabetes (with atypical symptoms of ACS)
- chronic kidney disease – estimated GFR < 60 mL/min (with atypical symptoms of ACS)
- prior aspirin use.

And not meeting the criteria for high-risk NSTEACS.

Low-risk NSTEACS

Presentation with clinical features consistent with ACS **without** intermediate- or high-risk features, for example **one** of the following:
- onset of anginal symptoms within the last month
- worsening in severity or frequency of angina
- lowering in anginal threshold.

Admit to coronary care unit or other high-dependency unit.
- Estimate ischaemic risk (risk score)
- Estimate bleeding risk (bleeding score)
- Choose augmented anti-thrombotic therapy

YES ↑

Recurrent ischaemia or elevated troponin

NO → **Stress test (e.g. exercise ECG)**

Refer for angiography → **PCI or CABG** / **Medical therapy**

+ive ↑

−ive ↓

Appropriate period of observation → **Discharge with urgent cardiac follow-up (on upgraded medical therapy)**

* This algorithm applies to patients with suspected ACS, in the absence of other plausible causes of troponin elevation (e.g. sepsis, pulmonary embolus). Where other diagnoses are evident, management should be directed at these conditions.

† Substantial early elevations in troponin may indicate evolving MI or other diagnoses associated with increased risk – immediate evaluation is required. Management decisions should not be delayed for repeat troponin testing at six hours.

§ Significant change: the Universal Definition of MI has recommended a change of 20% (3 SD) from baseline be considered significant with contemporary assays.

‡ Due to the increased sensitivity, a change of 50% or more may be required to make the diagnosis of evolving MI using the newer assays, but the clinical significance of changes from very low baseline levels is uncertain. Research, currently ongoing, will clarify this recommendation.

Note: This algorithm is based upon high-sensitivity troponin tests.[1] If high-sensitivity troponin testing is unavailable, assessment should be based on 4- and 8-hour time points.

Note
All patients with ACS should be given a written chest pain action plan and referred to comprehensive ongoing prevention and cardiac rehabilitation services.

1. Based on expert opinion

Based on the '2011 Addendum to the National Heart Foundation of Australia/Cardiac Society of Australia and New Zealand Guidelines for the Management of Acute Coronary Syndromes (ACS), 2006', published in *Heart, Lung and Circulation*, 2011;20:487–502. For more information, refer to this article or call our Health Information Service on 1300 36 27 87.

ISBN: 978-1-921748-69-1

POS-035 IPM 9/11