LRI Emergency Department

NSTEMI - diagnosis & early management

Use in all patients aged > 24 years with chest pain suggestive of ACS (see box 1) unless:

- **No chest pain since > 72h**
- **Clearly stable angina only**
- **Clearly due to other causes (e.g. trauma or shingles)**
- **STEMI / new LBBB on ECG**
- **Suspected oesophageal rupture**
- **Pain pleuritic**
- **Recent cocaine use**
- **Clinical frailty score >6 (shared decision with patient / family)**

Disclaimer:
This is a clinical template; clinicians should always use judgment when managing individual patients

Created by Martin Wiese . Version 99

Re-approved by ED Guidelines Committee on 25Sep24
Review due Sep27 . Trust Ref: C70/2016

Patient details

Full name

DoB

Unit number

(use sticker if available)

① Symptoms of possible ACS?

- Chest pain and / or pain in arms, back or jaw lasting at least 1min ☐
- Chest pain radiating to both arms ☐
- Chest pain associated with nausea and vomiting, sweating or DiB ☐
- Chest pain associated with hemodynamic instability (SBP <100, HR <50 or >100) ☐
- Frequently recurrent chest pain (either new onset or abrupt deterioration in previously stable angina) with little or no exertion ☐

② Acute aortic syndrome flags?

☐ **Yes**, as at least one of the below

Risk factors

- Known aortic aneurysm (including repaired) ☐
- Marfan syndrome ☐
- Loeys-Dietz syndrome ☐
- Turner syndrome ☐
- Bicuspid aortic valve ☐
- Ehlers-Danlos Syndromes ☐
- Aortic valve disease ☐
- Aortic procedure within last 6 weeks (e.g. cardiac surgery, PCI, diagnostic coronary angiography, TAVI or TEVAR) ☐
- Family history of AAS (i.e. aortic dissection, intramural haematoma or ulcer with leak) ☐

High-risk pain features

- Severe or worst ever ☐
- Thunderclap or abrupt ☐
- Tearing or ripping ☐
- Migrating or radiating ☐

High-risk exam findings

- Pulse deficit including limb ischaemia (check for decrease or absence of radial, carotid, subclavian and femoral pulses) ☐
- New neurological deficit:
  - Stroke or TIA (RIGHT most common) ☐
  - Paraplegia ☐
  - Limb pain/paraesthesia/motor deficit ☐
  - Hypoxic encephalopathy (confusion) ☐
  - Horner syndrome ☐
- Aortic insufficiency / regurgitation ☐
- Hypotension ☐

☐ **No**, as none of the above

③ Enoxaparin cautions required?

☐ **YES**, as at least one of the below

- Hb <100 unless known to be chronic and stable ☐
- Any active bleeding ☐
- Platelet count <75.000 ☐
- Hypersensitivity to any heparin product ☐
- History of heparin-induced thrombocytopenia ☐
- Currently on oral anticoagulant or heparin ☐
- Prolonged PT or APTT (INR or APTR >1.2) ☐
- Inherited bleeding disorder (e.g. haemophilia or von Willebrand disease) ☐
- Acquired bleeding disorder (e.g. chronic liver disease or acquired Haemophilia A) ☐
- Gastrointestinal bleed <2/52 ago ☐
- Surgical procedure <2/52 ago ☐
- Cerebral neoplasm that has bled previously ☐
- Non haemorrhagic stroke <1/52 ago ☐
- Haemorrhagic stroke <2/52 ago ☐
- Spontaneous intracerebral bleed <2/52 ago ☐
- Sub- or extradural haematoma <10/7 ago ☐
- Traumatic SAH <10/7 ago ☐
- Cerebral haemorrhagic contusion <10/7 ago ☐
- Neurosurgical procedure <48 hours ago ☐
- LP/epidural/spinal anaesthesia <4 hours ago ☐
- Eye surgery/retinal lasering <48 hours ago ☐
- On treatment for bacterial endocarditis ☐
- Haemorrhagic pericardial effusion ☐
- Haemorrhagic pleural effusion ☐
- On dialysis ☐
- Systolic BP >180 or diastolic >110 despite treatment (e.g. with opiate analgesia, IV beta blocker or GTN infusion) ☐

☐ **NO**, as none of the above

④ Is NSTEMI (very) high-risk?

☐ **Yes**, at least one of the below

- Haemodynamic instability or cardiogenic shock ☐
- Recurrent or ongoing chest pain despite medical treatment ☐
- Acute heart failure presumed to be due by ongoing myocardial ischaemia ☐
- Life-threatening arrhythmias ☐
- Mechanical complications ☐
- Recurrent dynamic ischaemic ECG changes ☐
- GRACE risk score >140 ☐
- Transient ST-segment elevation ☐
- T-wave changes ☐

☐ **No**, none of the above

HH:MM
Time (latest) chest pain episode started

Acute aortic syndrome (AAS) flags (see box 2)? Y → **Time out!** Work through AAS management proforma with an ED senior clinician.

N

- 12-lead ECG **NOW**
- Give aspirin 300mg PO
- Establish IV access
- Oxygen only if hypoxic
- Obtain CXR
- Obtain FBC, VBG, U&E, troponin * and total cholesterol (any other bloods only as needed)
- Provide good **analgesia**

* UHL's high-sensitivity troponin assay is the Siemens HS Troponin-I, on Atellica IM analysers

Analgesia may include

- GTN 800 micrograms SL **once**
- Paracetamol 1g PO
- Dihydrocodeine 30mg PO
- Morphine 2-10mg IV if pain severe (score 7-10)
- Metoclopramide 10mg IV **ONLY** if nausea present (**NB**: **Avoid cyclizine**)
- GTN infusion only if NSTEMI diagnosed **AND** pain recurs after an initial dose of morphine

ECG features of NSTEMI **AND** typical clinical picture? Y

Regional deep T-wave inversion or ST-depression

N

Initial troponin
ng/L
Time obtained
HH:MM

Troponin ≥100ng/L, or dynamic ischaemic ECG changes while troponin awaited? Y

N

Troponin <5ng/L **AND** sample taken >2h after onset of chest pain? Y → **ACS excluded**

N

Repeat troponin 2 hours after initial sample

Repeat-troponin
ng/L
Time obtained
HH:MM

Repeat-troponin ≥100ng/L, or dynamic ischaemic ECG changes while repeat-troponin awaited? Y

N

Did troponin value change by 3ng/L or more? Y

N

Manage as NSTEMI

- Complete boxes 3 and 4
- Manage pt as per box 5 *

* Please note:

- **DO NOT** diagnose NSTEMI on the basis of raised troponin alone. If no typical ischaemic symptoms, also consider Type II MI (oxygen delivery/demand imbalance; e.g. due to shock, respiratory failure or sustained tachyarrhythmia) or acute non-ischaemic myocardial injury (e.g. due to sepsis, acute heart failure or myocarditis). If in doubt, apply the Acute Cardiology Decision Aid and discuss with ED senior.
- Admission *may* not be in the best interest of **very frail people** but decisions to discharge such pts instead can be ethically complex and are thus best limited to be made by consultants only

Discharge (unless there are other concerns or reasons to admit) after completing the ED proforma 'CAD likelihood assessment'

① Assessment by ② Senior sign-off by (consultant if present, ST3 or above after hours)

①

②

Print name | Signature | Position | Date | Time

⑤ NSTEMI management

- Ensure analgesia and antiemetic needs are met
- Unless any cautions are identified (see box 3), give enoxaparin (in NC Meds, go to Emergency Medicine (ED) > Anticoagulation (ED) > Enoxaparin (ED ONLY) > ACS; select dose as per pt's creatinine clearance and weight)
- Calculate GRACE 2.0 risk and score (see box 8 below; **NB**: **NOT** required if diagnosis based on ECG changes)
- Add clinical photograph of all ECG(s) to Nervecentre
- **NB**: NSTEMIs will occasionally progress to STEMI. Repeat ECG as guided by clinical changes.

- Create 'Cardiology' e-referral (select 'Advice' as reason); ensure referral includes all details described in box 6
- Bleep cardiology 'registrar' on ***88-2584-[1extn]** (try CCU **13719** or **13774** if no answer) to discuss if
  - Any '(very) high-risk criteria' (see box 4) are present
  - Failure to respond to the e-referral within 30min

- Record received cardiology referral outcomes in box 7

⑥ Cardiology e-referral details

Include all of the information below…

- Nature, onset time and duration of chest pain
- Any radiation and associated symptoms
- Any history of CAD and other heart disease
- GRACE risk score (see box 6 below)
- Any regular antiplatelets or anticoagulants
- Any required enoxaparin cautions (see box 3)
- Clinical frailty score (CFS)
- Any of the '(very) high-risk criteria' (see box 4)

…and request advice regarding the following (copy & paste the below into your referral)

- Suggested disposition (CDU, CCU or AFU)?
- Suggested STAT antiplatelets in addition to aspirin 300mg PO?
- If CCU admission is required: Urgency of transfer?
- if AFU admission is recommended: Antiplatelet strategy?
- (Only if enoxaparin cautions required:) Alternative anticoagulation strategy?

⑦ Cardiology referral outcomes

Disposition

☐ CCU ☐ CDU ☐ AFU (conservative management)

Antiplatelets

☐ Aspirin only ☐ Add ticagrelor ☐ Add clopidogrel

Glenfield transfer modus (if applicable)

☐ ED inter-site transfer ambulance (any crew)
☐ ED inter-site transfer ambulance (paramedic crew only)
☐ ED transfer (paramedic crew only) with lights and sirens or **999** Emergency Ambulance; 'Inter-Facility Transfer Level 2 (IFT2)'

⑧ GRACE 2.0 score

Go to MDcalc or use QR code; record required variables in calculator screenshot below

GRACE ACS Risk and Mortality Calculator

Estimates admission-6 month mortality for patients with acute coronary syndrome.

When to Use ⌄ | Pearls/Pitfalls ⌄ | Why Use ⌄

Age		years
Heart rate/pulse		beats/min
Systolic BP		mm Hg
Creatinine		µmol/L ⇋
Cardiac arrest at admission	No ☐	Yes ☐
ST segment deviation on EKG?	No ☐	Yes ☐
Abnormal cardiac enzymes (troponin >99th percentile) — Men >54ng/L, Women >34ng/L	No ☐	Yes ☐
Killip class (signs/symptoms)	No CHF ☐	
	Rales and/or JVD ☐	
	Pulmonary edema ☐	
	Cardiogenic shock ☐	

This is the relevant value for box 4 (high-risk if >140)

%	points
Probability of death from admission to 6 months	GRACE Score