Angina & Acute Coronary Syndrome

- Acute coronary syndrome (ACS) includes unstable angina, STEMI, and NSTEMI

- STEMI is a common medical emergency; prompt appropriate treatment saves lives.

- The difference between UA and NSTEMI is that, in the latter, there is occluding thrombus, which leads to myocardial necrosis and a rise in serum troponins or creatine kinase-MB (CK-MB).

- Myocardial infarction (MI) occurs when cardiac myocytes die due to myocardial ischaemia.

- It can be diagnosed on the basis of appropriate clinical history, 12-lead ECG and elevated biochemical markers: troponin I and T, and CK-MB.

Clinical features

- Patients with an ACS may complain of a new onset of ***chest pain***, chest pain at rest or a deterioration of pre-existing angina.

- However, some present with atypical features, including indigestion, pleuritic chest pain or dyspnoea.

- Physical examination can detect alternative diagnoses, such as aortic dissection, pulmonary embolism or peptic ulceration. In addition, it can also identify adverse clinical signs, such as hypotension, basal crackles, fourth heart sounds and cardiac murmurs.

Acute STEMI

Attach ECG monitor & record a 12 lead ECG

IV access
Bloods for FBC, electrolytes, glucose, lipids & troponin.

Brief assessment: complete history & examination- pulse, BP (both arms), JVP, murmurs, signs of congestive cardiac failure

Aspirin 300mg
Clopidogrel 150 mg
Morphine 5mg with an antiemetic

STEMI on ECG and PCI available within 120 minutes?

If yes- Primary PCI
If no- fibrinolysis

Transfer to primary PCI centre for either rescue PCI
if fibrinolysis unsuccessful
or for angiography.

Reperfusion therapy

- Early coronary reperfusion saves lives; decisions must be taken quickly so seek senior advice early. Look for typical clinical symptoms of MI plus ECG criteria:
  - ST elevation >1mm in ≥2 adjacent limb leads or >2mm in ≥2 adjacent chest leads.
  - LBBB (unless known to have LBBB previously).
  - Posterior changes: deep ST depression and tall R waves in leads V1 to V3.

Reperfusion therapy

- Therapy may be percutaneous intervention (PCI—with angiographic identification of the culprit blockage(s) and revascularization via deployment of an expandable metal stent) or thrombolysis (with systemically administered clot-dissolving enzymes)

Reperfusion therapy

- ***Primary PCI:*** Should be offered to all patients presenting within 12h of symptom onset with a STEMI who either are at or can be transferred to a primary PCI centre within 120min of first medical contact.

- If this is not possible, patients should receive thrombolysis and be transferred to a primary PCI centre after the infusion for either rescue PCI (if residual ST elevation) or angiography (if successful).

Reperfusion therapy

- ***Thrombolysis:*** Benefit reduces steadily from onset of pain, target time is <30min from admission; use >12h from symptom onset requires specialist advice.

- Do not thrombolyse ST depression alone, T-wave inversion alone, or normal ECG.
- Thrombolysis is best achieved with tissue plasminogen activators (eg tenecteplase as a single IV bolus). *CI:* •Previous intracranial haemorrhage. •Ischaemic
- stroke <6months. •Cerebral malignancy or AVM. •Recent major trauma/surgery/
- head injury (<3wks). •GI bleeding (<1 month). •Known bleeding disorder. •Aortic
- dissection. •Non-compressible punctures <24h, eg liver biopsy, lumbar puncture.
- *Relative CI:* •TIA <6 months. •Anticoagulant therapy. •Pregnancy/<1wk post par
- tum. •Refractory hypertension (>180mmHg/110mmHg). •Advanced liver disease.
- •Infective endocarditis. •Active peptic ulcer. •Prolonged/traumatic resuscitation.

Reperfusion therapy

- *Contraindications for thrombolysis*
- Previous intracranial haemorrhage.
- Ischaemic stroke <6months
- Cerebral malignancy or AVM
- Recent major trauma/surgery/ head injury (<3wks)
- GI bleeding (<1 month)
- Known bleeding disorder
- Aortic dissection.
- Non-compressible punctures <24h, eg liver biopsy, lumbar puncture.

Reperfusion therapy

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- TIA <6 months
- Anticoagulant therapy
- Pregnancy/<1wk post partum
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- Prolonged/traumatic resuscitation.

Acute coronary syndrome—without ST-elevation

- First stabilize with medical therapy; early risk stratification will identify those in need of further treatment and prompt angiography (involve cardiologists).

- **Assessment**
- *Brief history:* Previous angina, relief with rest/nitrates, history of cardiovascular disease, risk factors for IHD.
- *Examination:* (See p38.) Pulse, BP, JVP, cardiac murmurs, signs of heart failure, peripheral pulses, scars from previous cardiac surgery.

Acute coronary syndrome—without ST-elevation

- **Investigations** ECG: ST depression; flat or inverted T-waves; or normal; FBC, U&E, troponin, glucose, random cholesterol; CXR.

Acute management of cardiac chest pain

Monitor closely; record ECG while in pain

If SaO2 <90% or breathless, low-flow O2

Analgesia: Eg morphine 5–10mg IV + metoclopramide 10mg IV

Nitrates: GTN spray or sublingual tablets as required

Aspirin: 300mg PO. Consider need for second antiplatelet agent

Measure troponin and clinical parameters to risk assess, eg GRACE score

Acute management of cardiac chest pain

Invasive strategy (high-risk pt):

- *Rise in troponin **OR:***
- *Dynamic ST or T–wave changes*
- *Secondary criteria—diabetes, CKD, LVEF <40%, early angina post MI, recent PCI, prior CABG, intermediate to high-risk GRACE score.*

Given fondaparinux, ticagrelor or prasugrel, nitrates & oral beta blocker

Then a prompt cardiology review is done.

Acute management of cardiac chest pain

Conservative strategy (low-risk pt):

- *No recurrence of chest pain*
- *No signs of heart failure*
- *Normal ECG*
- *—ve baseline (± repeat) troponin*

- May be discharged (check troponin interval required with your laboratory and retest after delay if necessary).
- Arrange further outpatient investigation, eg stress test.