CAUSES AND PREVENTION OF CARDIORESPIRATORY ARREST

Objectives

To understand:

- The causes of cardiorespiratory arrest in adults
- How to identify patients at risk
- The role of a Medical Emergency Team
- The initial management of patients at risk of a cardiorespiratory arrest

Causes of cardiorespiratory arrest
1. Airway obstruction

- CNS depression
- Blood, vomit, foreign body
- Trauma
- Infection, inflammation
- Laryngospasm
- Bronchospasm

Causes of cardiorespiratory arrest
2. Breathing inadequacy

- Decreased respiratory drive
  - CNS depression
- Decreased respiratory effort
  - neurological lesion
  - muscle weakness
  - restrictive chest defect
- Pulmonary disorders
  - pneumothorax, lung pathology

Causes of cardiorespiratory arrest
3. Cardiac abnormalities

Primary

- Ischaemia
- Myocardial infarction
- Hypertensive heart disease
- Valve disease
- Drugs
- Electrolyte abnormalities

Secondary

- Asphyxia
- Hypoxaemia
- Blood loss
- Septic shock

Recognition of patients at risk

- History, examination, investigations
- Clinical indicators of deterioration before in-hospital cardiac arrest in 80%
  - tachypnoea
  - tachycardia
  - hypotension
  - reduced conscious level

Medical Emergency Team (MET) Calling Criteria

- Airway -threatened
- Breathing
  - Respiratory arrest
  - RR < 5 or RR >36
- Circulation
  - cardiac arrest
  - PR < 40 or PR >140
  - Systolic BP < 90
- Neurology
  - sudden fall in GCS > 2
- Any other worries

RR = respiratory rate

PR = pulse rate

Airway obstruction

Symptoms and signs

- Difficulty breathing, distressed, choking
- Shortness of breath
- Stridor, wheeze, gurgling
- See-saw respiratory pattern

Actions

- Suction, positioning
- BLS manoeuvres
- Advanced airway intervention

Breathing inadequacy

Symptoms and signs

- Short of breath, anxious, irritable
- Decrease in conscious level
- Tachypnoea
- Cyanosis

Action

- Oxygen
- Ventilatory support
- Treat underlying cause where possible

Cardiac abnormalities: Acute Coronary Syndromes

Clinical syndromes form spectrum of the same disease process:

Unstable angina

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Non-Q wave myocardial infarction

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Q wave myocardial infarction

Stable angina

- Pain from myocardial ischaemia
  - tightness/ache across chest
  - radiating to throat/arms/back/epigastrium
  - provoked by exercise
  - settles when exercise ceases
- NOT an acute coronary syndrome

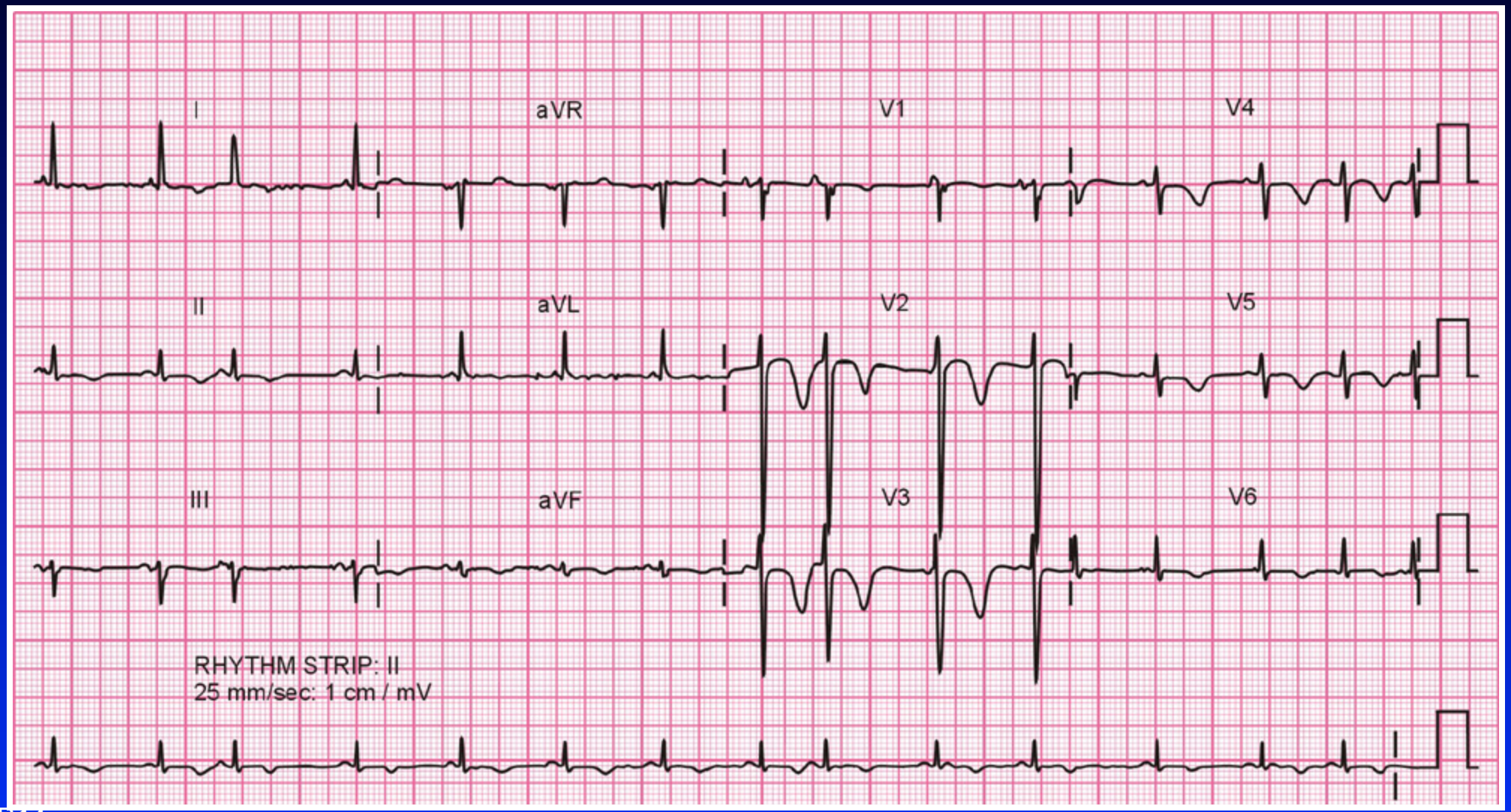
Unstable angina

- Angina of effort with increasing frequency and provoked by less exertion
- Angina occurring recurrently and unpredictably - not specific to exercise
- Unprovoked and prolonged episode of chest pain - no ECG or laboratory evidence of MI

Non-Q wave myocardial infarction

- Symptoms suggesting MI
- Non-specific ECG abnormalities
  - –ST segment depression
  - –T wave inversion
- Elevated cardiac enzymes
- Unstable coronary artery disease
  - –unstable angina
  - –non-Q wave MI

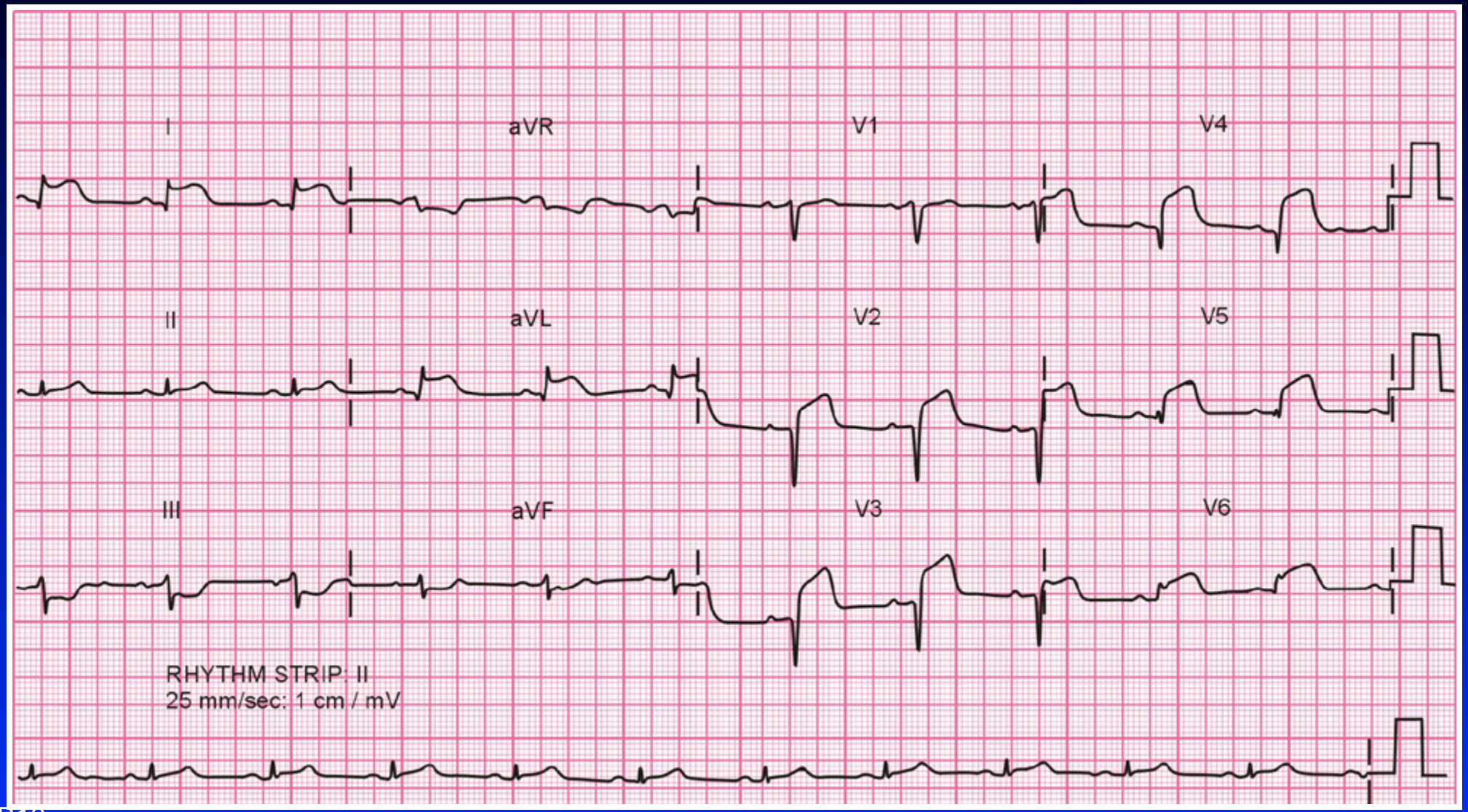
Non-Q wave myocardial infarction



Q wave myocardial infarction

- Prolonged chest pain
- Acute ST segment elevation
- Q waves
- Elevated cardiac enzymes
  - creatine kinase
  - troponins

Anterolateral myocardial infarction



Immediate treatment in all acute coronary syndromes

- "MONA"
  - Morphine (or diamorphine)
  - Oxygen
  - Nitroglycerine (GTN spray or tablet)
  - Aspirin 300 mg orally (crushed/chewed)

Patients with ST segment elevation MI or MI with LBBB

Early coronary reperfusion therapy:

- Thrombolytic therapy
  - streptokinase
  - alteplase
- Percutaneous transluminal coronary angioplasty (PTCA)
- Coronary artery bypass surgery (CABG)

Indications for thrombolytic therapy for MI

Presentation < 12 h of typical chest pain, and:

- ST segment elevation:
  - > 0.2 mV in 2 adjacent chest leads, or
  - > 0.1 mV in 2 or more limb leads
- New onset left bundle branch block
- Dominant R waves and ST depression in V1-V3
- Presentation 12-24 h after onset of pain with continuing pain +/- evolving MI on ECG

Absolute contraindications to thrombolytic therapy

- Previous haemorrhagic stroke
- Other stroke or CVA within 6 months
- Active internal bleeding
- Aortic dissection

Unstable angina and non-Q wave MI

- "MONA"
- Heparin
  - –continuous infusion unfractionated, or
  - –subcutaneous low molecular weight
- Intravenous nitrate
- If "high risk" - glycoprotein IIb/IIIa inhibitor
- Consider beta-blockers

Any Questions?

Summary

- Airway, breathing or cardiac problems can cause cardiorespiratory arrest
- Patients often have warning symptoms and signs
- Early recognition may allow arrest prevention
- In acute coronary syndromes consider “MONA” and start reperfusion therapy early, if indicated