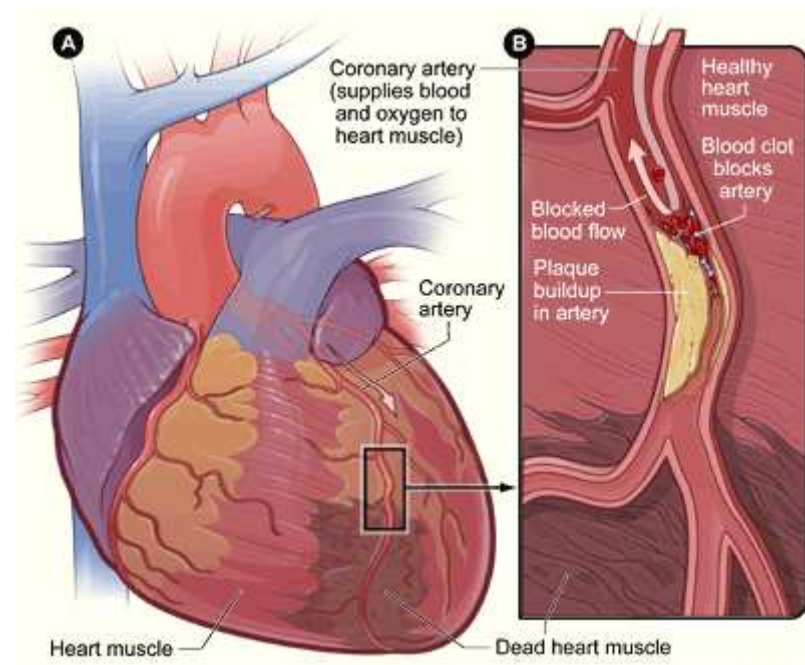


Diagnosis and Management of Acute Myocardial Infarction

- Acute MI occurs as a result of prolonged myocardial ischemia
- The pain associated with MI usually lasts longer than 30 minutes
- Atherosclerosis leads to endothelial rupture or erosion that leads to platelet aggregation at the site
- A thrombus forms and vasoconstrictors are released
-



Pathological Evolution of Myocardial Infarction

- Ischemic Insult
- Coagulation Necrosis (lack of oxygen causes cell death)
- Healing
- Scarring

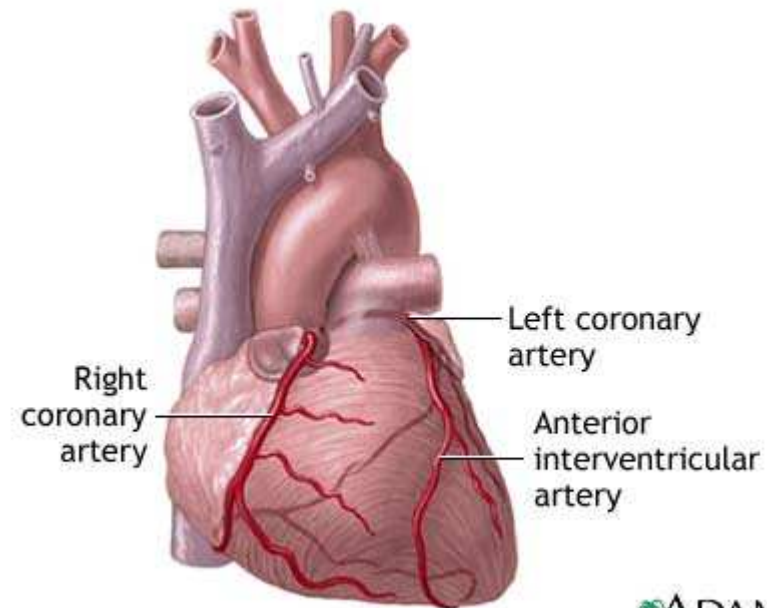
- Ischemic insult phase lasts 4 hours and within this period the tissue in the infarct maybe saved form necrosis if reperfusion occurs
- At 6 hours after occlusion the myocytes start to change
- The phase of coagulation necrosis lasts fomr 4 to 48 hours after infarction

- Healing begins after 48 hours after the occlusive event and lasts 7 days.
- The scarring phase begins in approximately one week after the infarction
- The scarring phase depends on the infarct size and may last from 2 weeks to months (Cunnigham 2000)

The endocardium increases in thickness

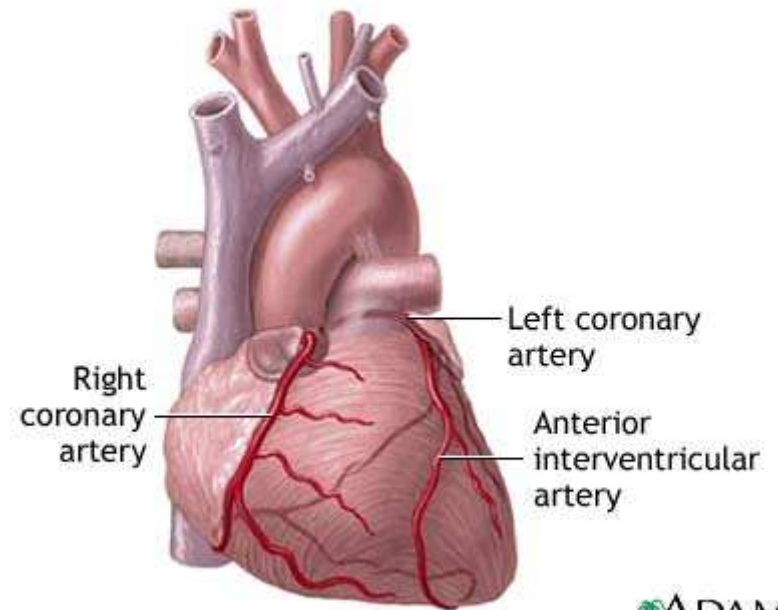
Classification of MI's

- Based on the location of the infarction and the layers of the heart involved
- Anterior MI's occur with the occlusion of the left anterior descending artery (LAD) a major supplier of the anterior wall of the left ventricle
- Complications: Severe LV dysfunction and cardiogenic shock.
- Changes in heart rhythm – tachycardia and AV block (the LAD supplies most of the intraventricular septum with blood)



Inferior/Posterior infarction

- Result from the occlusion of the right coronary artery which supplies 80% to 90% of the patients
- In the remaining 10% to 20% these MI result from the occlusion of the circumflex artery.
- Complications include vary heart block.



Diagnosis

- Based on history- chest discomfort which is severe and prolonged and may be described as crushing, constricting or oppressive. Pain may radiate to the neck, jaw and left arm
- Serial ECGs
- Serum enzyme change – indicative of cardiac muscle necrosis

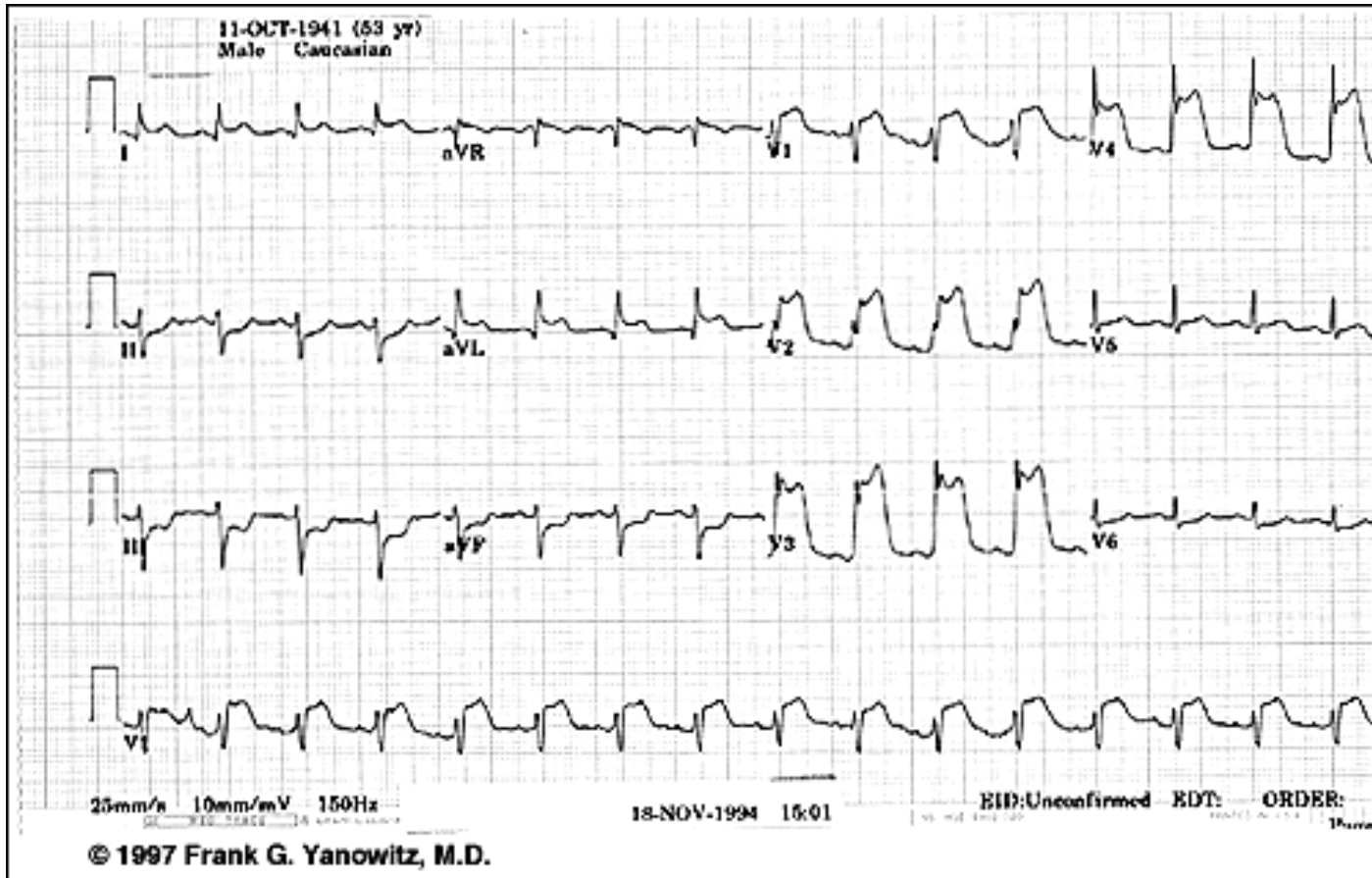
Common Physical Presentation

- General
 - Alert, anxious and often fatigued
- Skin
 - Cool, clammy diaphoretic
- Lungs
 - Dyspnoea +/- crackles
- Gastrointestinal
 - Nausea and vomiting

ECG

- The twelve lead ECG is central to diagnosis of MI because patient with ST segment elevation or new bundle branch block should receive immediate therapy.
- Diagnosis becomes difficult when there are pre-existing ECG abnormalities

Anterior AMI



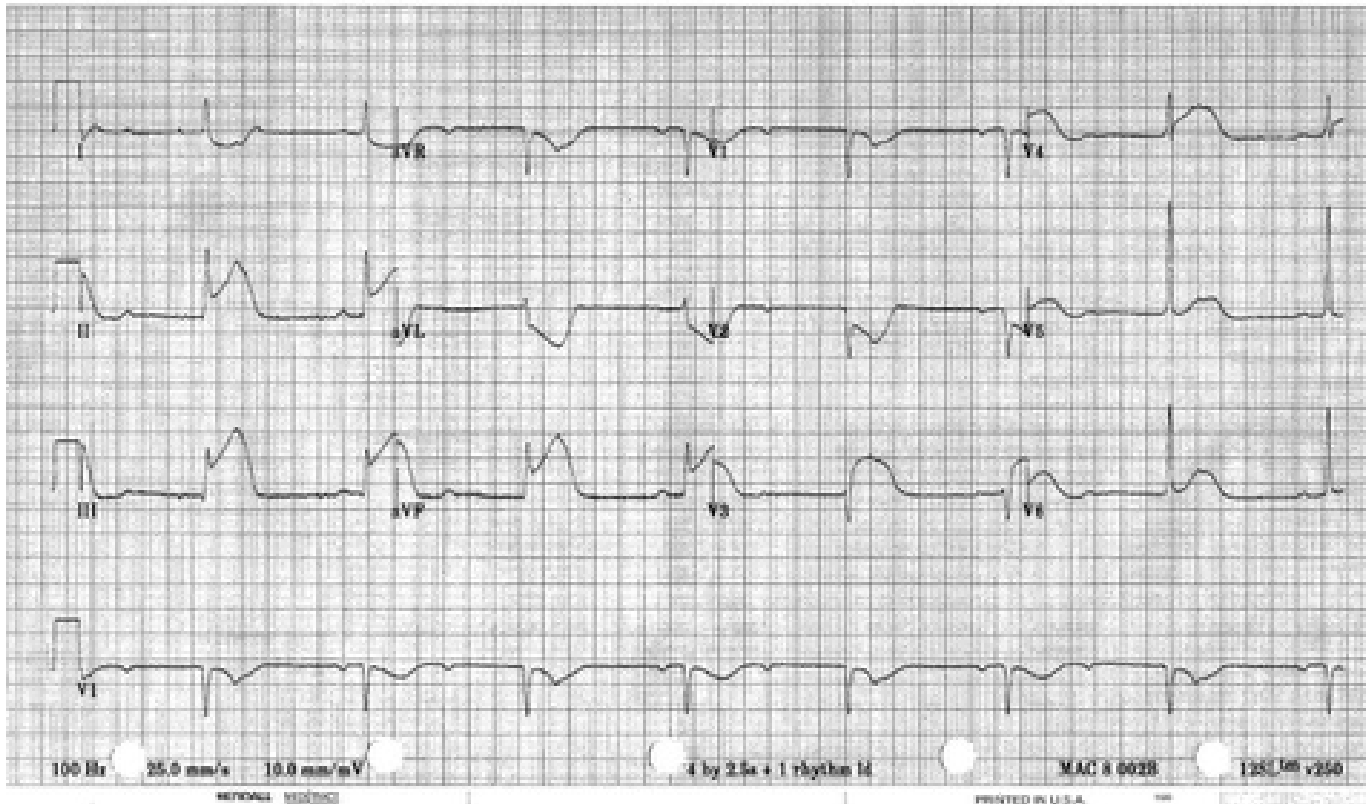
Acute Inferior AMI

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Male	Caucasian	Heart rate	47 bpm
		PR interval	* ms
		QRS duration	84 ms
Room:		QT/QTc	478/423 ms
		P-R-T axes	* 65 97

Technician:
Test ind:

Referred by: Unconfirmed



Intervention

- Thrombolytic therapy – recommended in patients without contraindications to restore coronary blood flow
- Primary coronary angioplasty – if performed in a timely manner by experienced cardiologists

Limitation of infarct size

- Early reperfusion with thrombolytics or primary PTCA
- Restoration of blood flow to the myocardium prevents the extension of infarction or re-infarction

Thrombolytic Therapy

- Fall in two categories:
- Fibrin selective agents – rt-PA (recombinant tissue plasminogen activator)
- Non-selective agents - Streptokinase

Streptokinase

- A product of haemolytic streptococci
- SK combines with circulating plasminogen and this creates a systemic lytic state with dissolution of recent thrombi
- Given in a dose of 1.5 million units infused over 30-60 minutes IV
- SK may trigger an antigenic response because of its foreign protein origin
- SK should not be used with patients with a known recent streptococcal infection and who received SK within the last 5 days to 6 months

rt-PA

- Produced by vascular endothelial cells
- Given in intermittent doses over an hour and a half
- Has a short half life therefore systemic anticoagulation with continuous intravenous heparin is given

Contraindications

- Previous haemorrhagic or stroke
- Active internal bleeding (this does not include menses)
- Suspected aortic dissection
- Severe uncontrolled hypertension
- Recent trauma (within 2-4 weeks)
- Recent internal bleeding
- Pregnancy
- Active peptic ulcer

Nursing

- Monitor for signs of reperfusion arrhythmias
- Common arrhythmias : Ventricular tachycardia, premature ventricular ectopics, heart blocks and sinus bradycardia
- Chest discomfort – always order ECG, read then act accordingly
- Monitor BP as a drop in BP can occur
- Bleeding
- Allergic Reactions

Immediate Nursing care

- Improve oxygenation – oxygen therapy and monitoring
- Pain Control – IVI morphine + maxalon for nausea
- Cardiac monitoring
- BP half hourly (in the initial stages this may be more frequent)
- Urine output
- During thrombolysis watch out for hypotension and bleeding plus allergic reactions (especially with SK)



Nursing care

Daily ECG s for the first three days – this will show the evolution of the infarct

Cardiac markers

Troponins are protein complexes found in cardiac and skeletal muscles. Consist of three subunits—troponin C, troponin I, and troponin T

Troponin I is actually found exclusively in the myocardium and is 100% sensitive to MI - It is elevated in MI

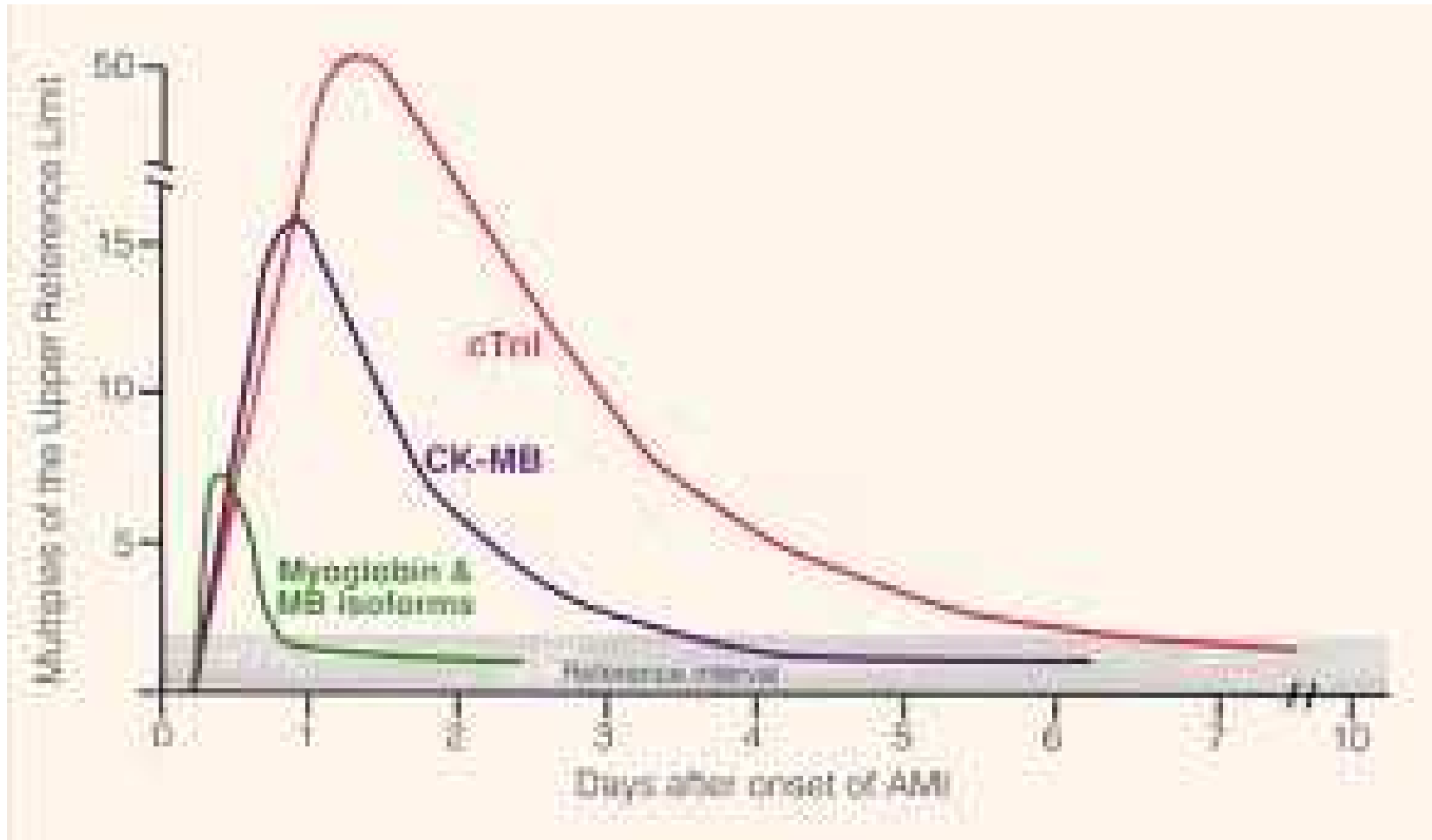
Myoglobin

- Found in myocardium and skeletal muscles
- Releases in into the circulation after damage to the heart or skeletal muscle
- High myoglobin levels are seen in skeletal muscle injury, severe burns and renal failure when this is not excreted

CKMB

- In acute MI inadequate oxygen delivery to the myocardium causes cell injury. CK diffused out from the cell into the blood
-
- CK MB is released from the damaged myocardial tissue

Cardiac Enzymes



- Respond to Pain – analgesia and ECG
- Observations – vital signs
- O₂ therapy
- Colour and respirations
- 4 hourly temperature
- Fluid intake and output
- Bed rest – 24 hours , bed to chair 48 hours then gentle mobilization

- Reassure about condition
- Allow visits as necessary
- Explain procedures and equipment
- Keep next of kin informed

Patient management post MI

- Pharmacological management – medications prescribed. Aspirin, nitrates, calcium channel blockers , ACE inhibitors and lipid lowering drugs
- Lifestyle modifications
- Follow up care

- Address risk factors: diet, smoking, weight
- Explain medications and their function – Aspirin, beta blockers, ACE inhibitors, nitrates, statins
- Gradually increase level of activity
- Discuss with cardiologist return to work – advice of cardiologist usually 2 months after infarct
- Driving – can be resumed usually after first out patient visit
- Sexual activity best avoided 1 month post MI
- Travel abroad discouraged for first 2 months

Post Myocardial Infarction Rehabilitation programme

- Usually starts 3 weeks after discharge and is of 12 weeks duration
- Ask patient to bring a relative with them
- On their first visit assess:
 - BP HR and symptoms of angina and breathlessness
 - Emphasis drug compliance and identify side effects
 - Try to define their psychological status eg. depression or anxiety
 - Establish smoking status ie stopped or considering stopping or re-started smoking
 - Weigh if necessary

Multidisciplinary education programme

- Diet and heart disease – dietician
- Cholesterol and heart disease – clinical biochemist
- Exercise and the heart – physiotherapist
- Drugs for the heart – pharmacist
- Blood pressure – cardiologist or physician
- Stress – rehabilitation nurse/ hospital psychologist
- Risk factors – rehabilitation nurse