



SNS COLLEGE OF ALLIED HEALTH SCIENCES
SNS Kalvi Nagar, Coimbatore - 35
Affiliated to Dr MGR Medical University, Chennai



DEPARTMENT OF CARDIO PULMONARY PERFUSION CARE
TECHNOLOGY

COURSE NAME : PRINCIPLES OF PERFUSION TECHNOLOGY

II YEAR

PATHOLOGY OF HEART

TOPIC : ANGINA AND ITS TYPES & MANAGEMENT



Angina Pectoris

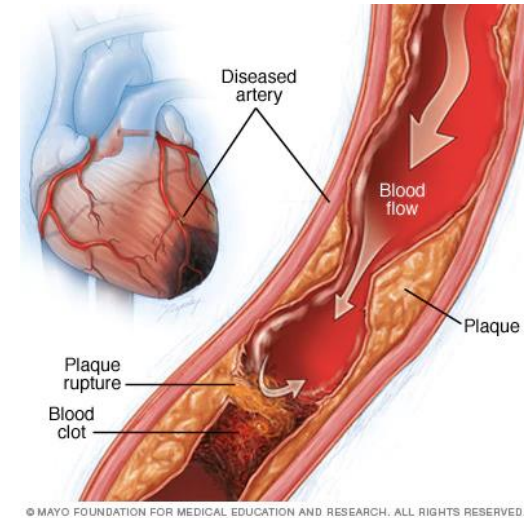


- Type of **chest pain**
- Not a disease, its a symptom of an underlying heart problem specially IHD
- Described as '**heavy**', '**tight**' or '**gripping**'.
- Mild ache to most severe that provokes **sweating and fear.**
- Associated **breathlessness**



Angina Pectoris

- Angina pectoris is a clinical syndrome of IHD resulting from **transient myocardial ischemia**.
- It is characterised by paroxysmal pain in the **sub-sternal or precordial region** of the chest which is aggravated by an increase in the demand of the heart



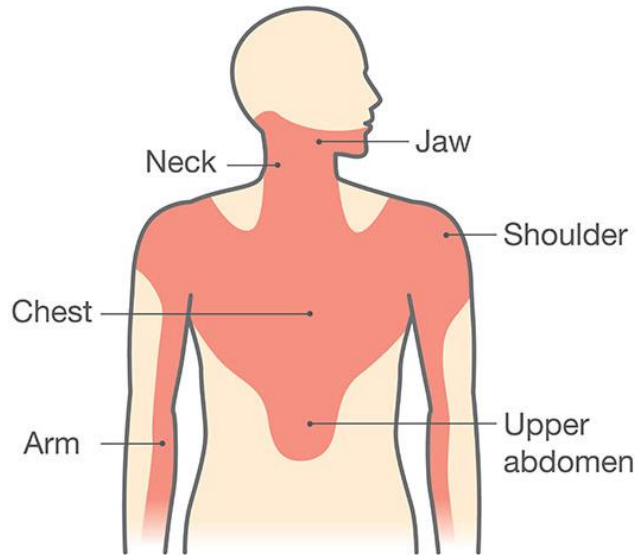
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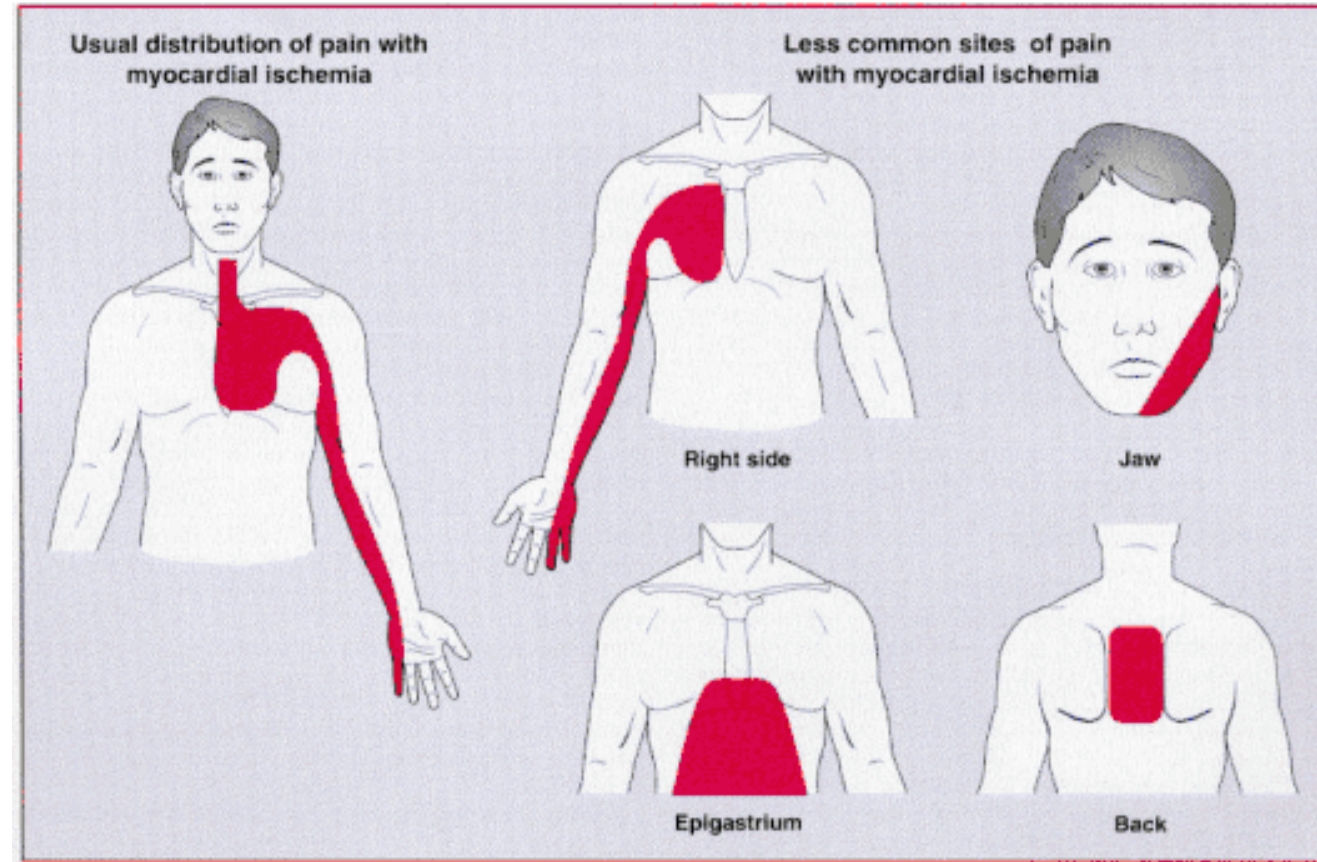
Radiation of Pain

The pain radiates to the,

- Left arm
- Neck
- Jaw
- Right arm.



It is more common in men past 5th decade of life.



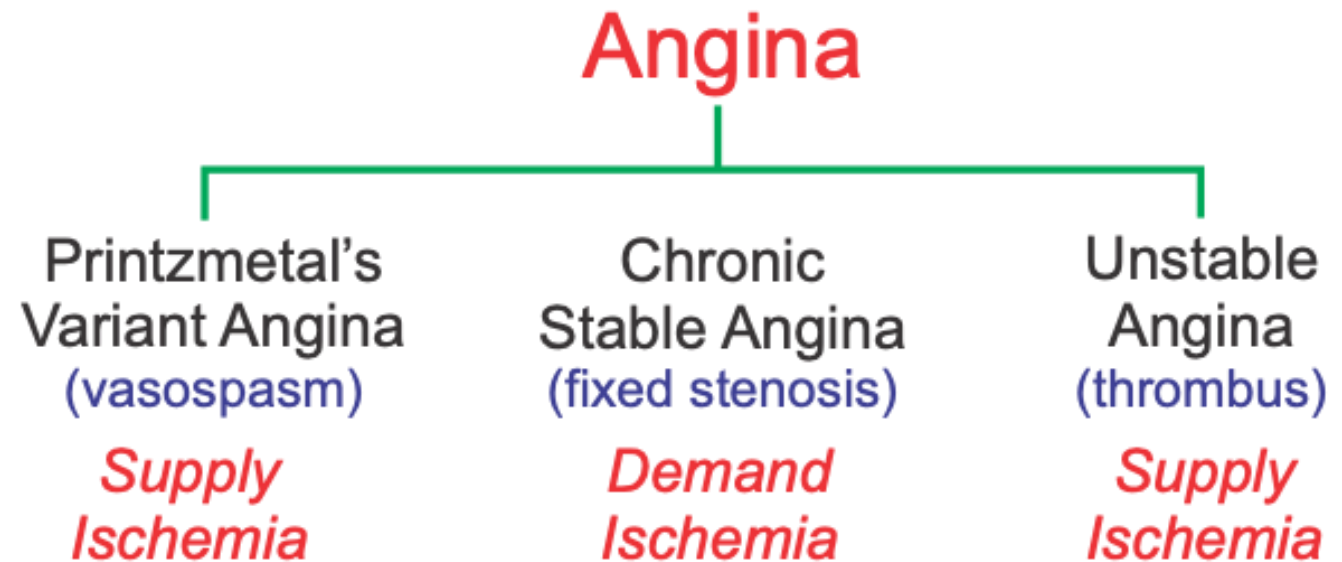


Patterns of Angina



There are 3 overlapping clinical patterns of angina pectoris with some differences in their pathogenesis:

- **Stable or typical angina**
- **Prinzmetal's variant angina**
- **Unstable or crescendo angina**





Stable or typical angina



- This is the most common pattern.
- Stable or typical angina is characterised by attacks of **pain following physical exertion** or emotional excitement and is relieved by rest.



Pathogenesis

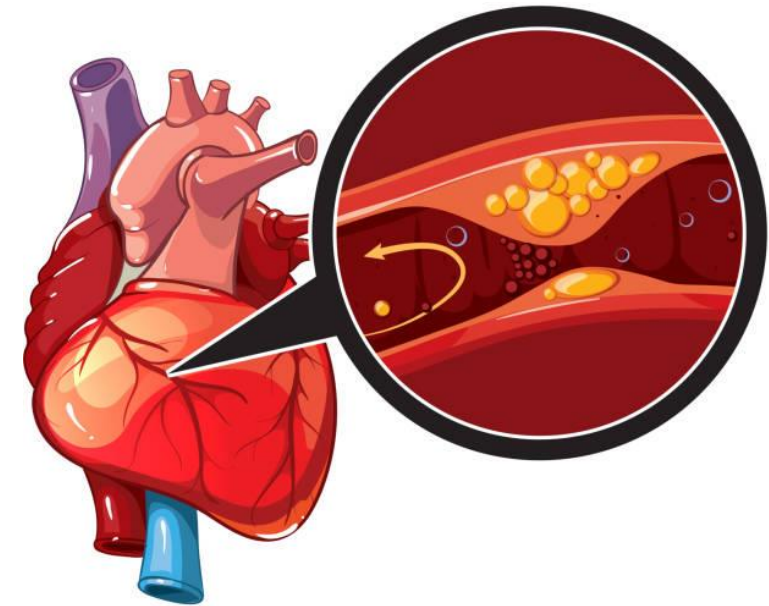
Chronic stenosing coronary atherosclerosis



Workload of the heart increases



Hypo-perfusion
of myocardium

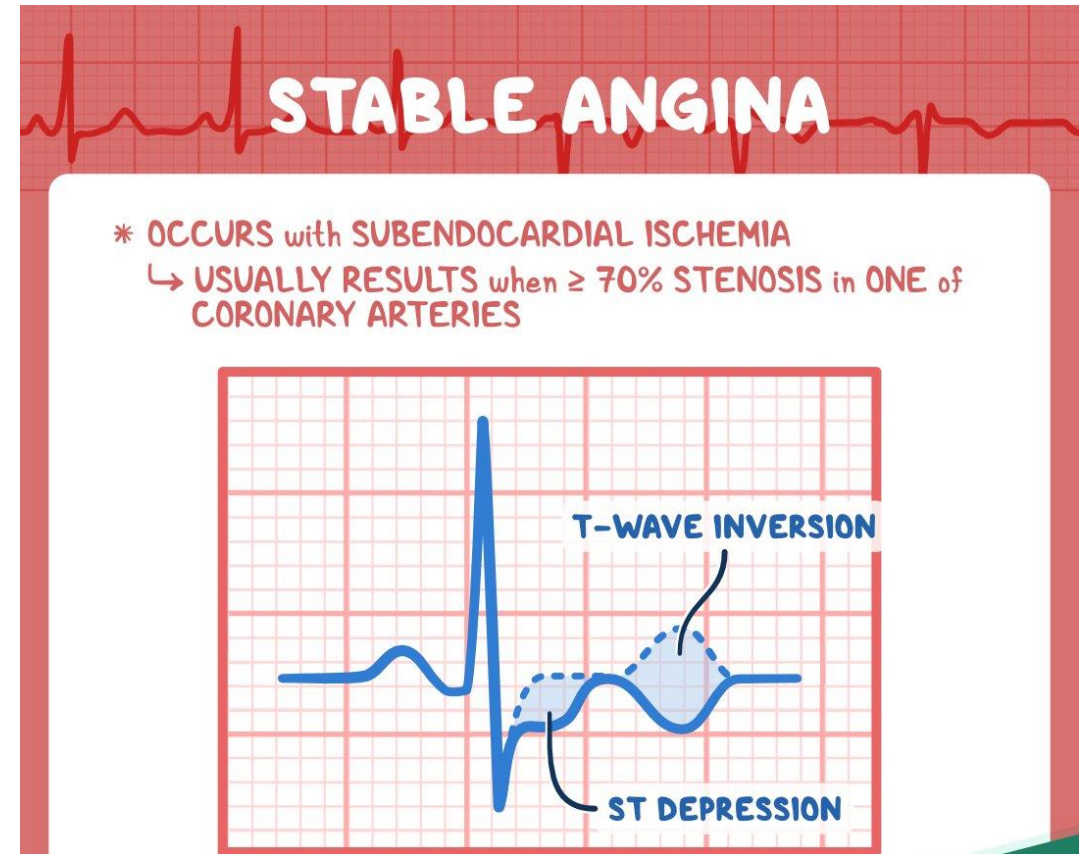




Identification



- There is **depression of ST segment** in the ECG due to poor perfusion of the sub-endocardial region of the left ventricle
- But there is **no elevation of enzymes** in the blood as there is no irreversible myocardial injury.

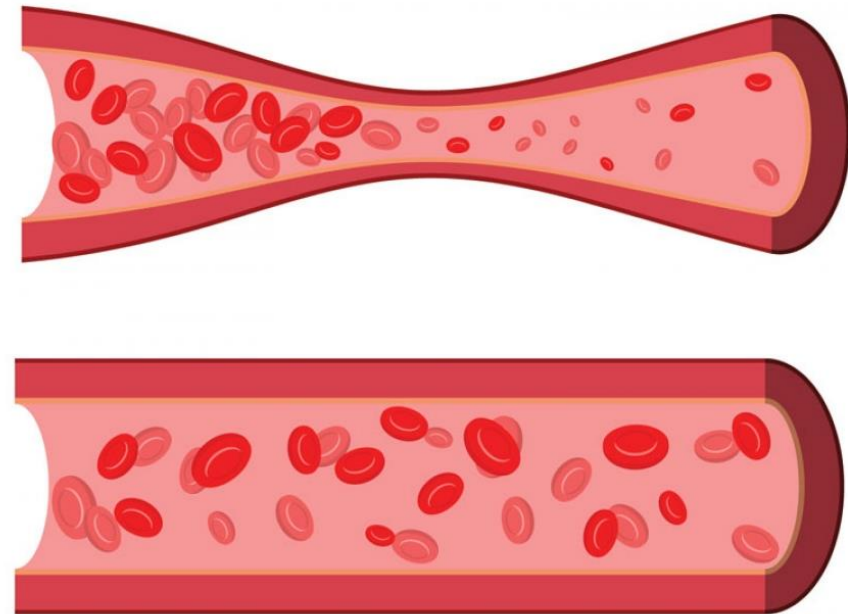




Prinzmetal's variant angina



This pattern of angina is characterised by **pain at rest** and has no relationship with physical activity.





Pathogenesis



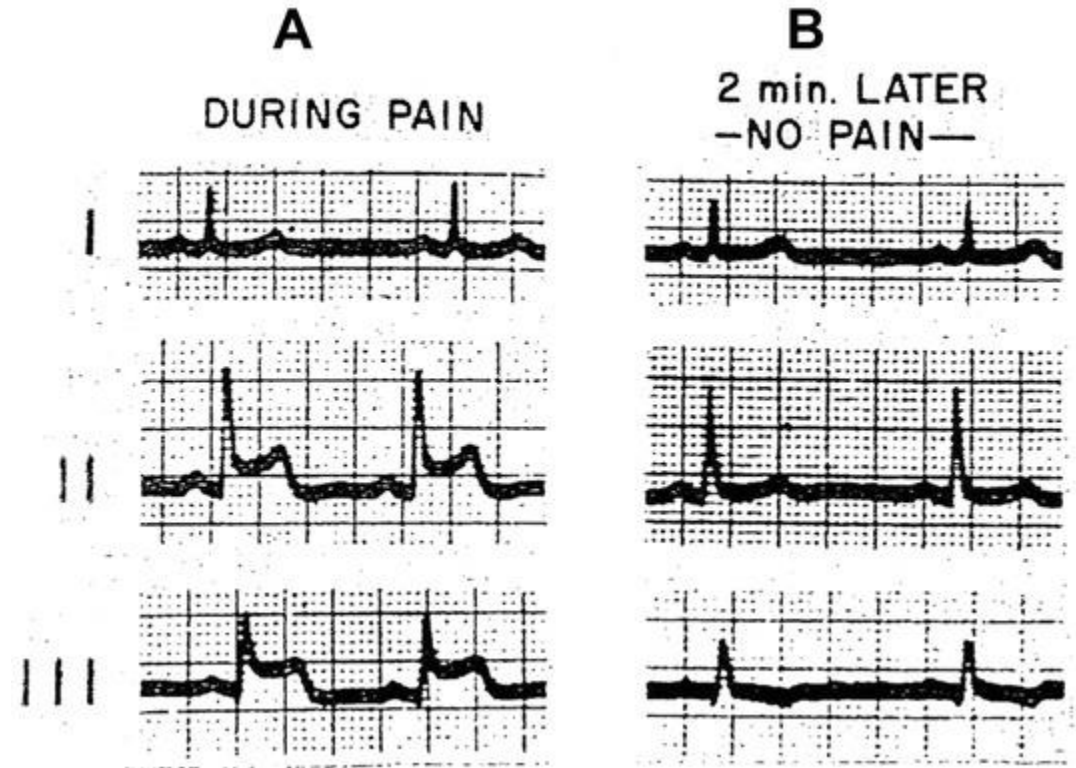
- The exact pathogenesis of Prinzmetal's angina is not known.
 - Coronary atherosclerosis & or may be due to release of hormonal vasoconstrictors by mast cells in the coronary adventitia
- ↓
- ***Sudden vasospasm*** of a coronary trunk
 - Vascular smooth muscle and hyperactivity of coronary arteries
 - Imbalance between vagus and sympathetic tone will precipitate spasm



Identification



- ECG shows **ST segment elevation** due to transmural ischemia.
- These patients respond well to vasodilators like nitroglycerin.

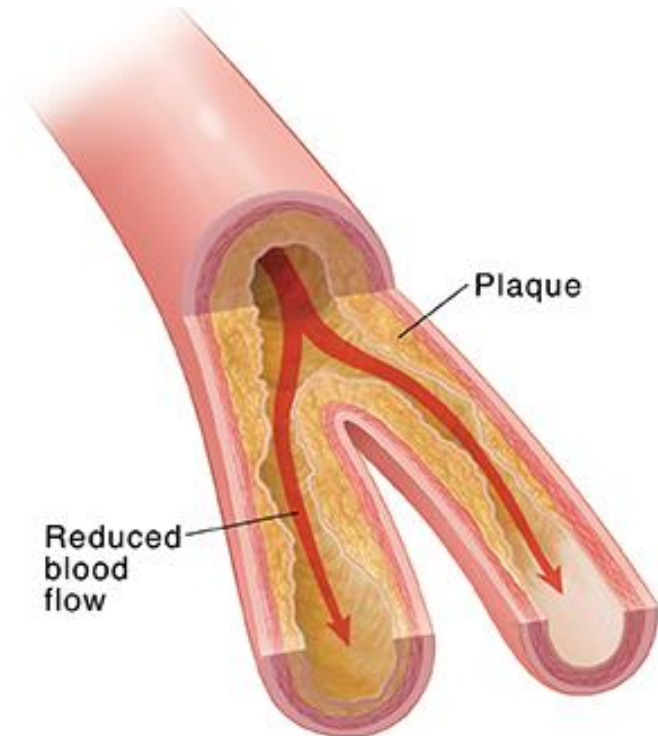




Unstable or crescendo angina



- Also referred to as '**pre-infarction angina**' or '**acute coronary insufficiency**', this is the most serious pattern of angina.
- It is characterised by more frequent onset of pain of prolonged duration and **occurring often at rest**.
- It is thus indicative of an impending acute myocardial infarction.





Pathogenesis



Multiple factors are involved in the pathogenesis of unstable angina

- Stenosis of coronary atherosclerosis
- Complicated coronary plaques (e.g. superimposed thrombosis, haemorrhage, rupture, ulceration etc.,)
- Platelet thrombi over atherosclerotic plaques
- Vasospasm of coronary arteries.



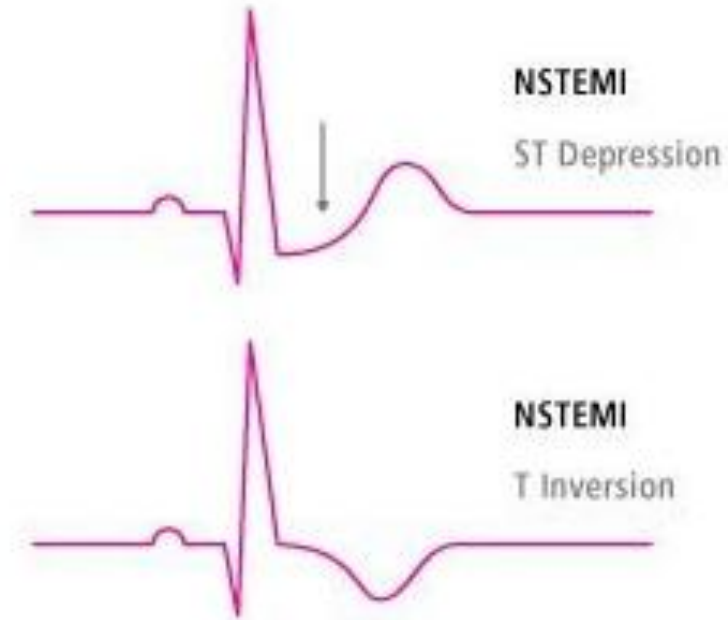
Identification



Acute MI characterised by ST segment elevation while unstable angina may have **non-ST segment elevation MI**.

Resting ECG

The most convincing evidence of myocardial ischemia - reversible ST segment depression or elevation, with or without T-wave inversion, at the time the patient is experiencing symptoms





Investigation



Exercise ECG

- Exercise tolerance test (ETT) - standard treadmill or bicycle while monitoring the patient's ECG, BP and general condition.
- **Planar or down-sloping** ST segment depression of $\geq 1\text{mm}$ is indicative of ischemia
- **Up-sloping** ST depression is less specific and often occurs in normal individuals



Investigation

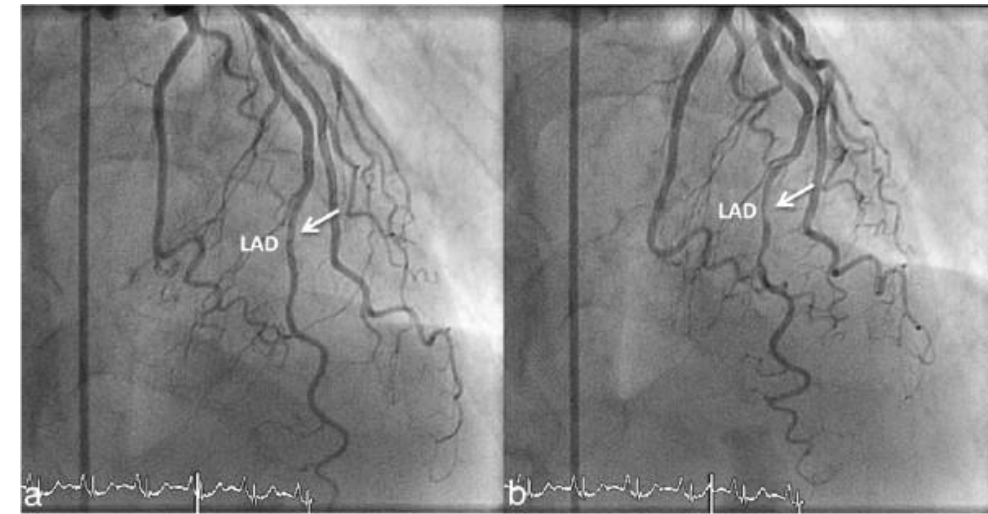


Other forms of stress testing

- ***Myocardial perfusion scanning***
- ***Stress echocardiography***

Coronary arteriography

- Detailed anatomical information about the extent and nature of coronary artery disease
- Indicated when non-invasive tests have failed to establish the cause of atypical chest pain
- Under local anaesthesia
- Requires specialised radiological equipment, cardiac monitoring and an experienced operating team





Medical management



Antiplatelet therapy

- Low-dose (75 mg) aspirin
- Clopidogrel (75 mg daily)

Anti-anginal drug treatment

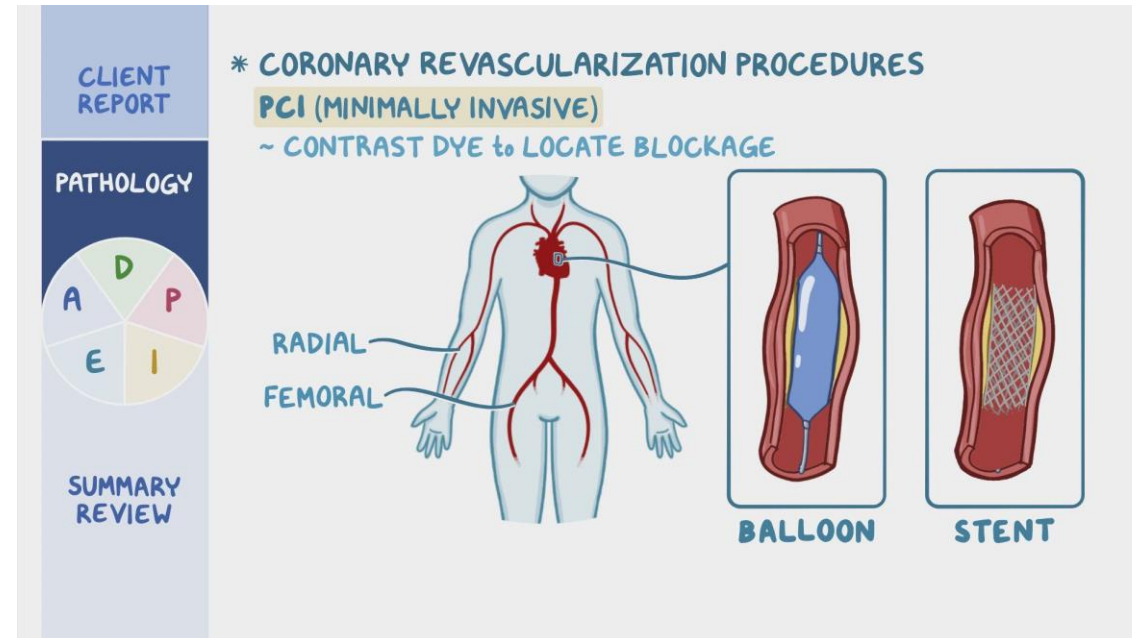
- Nitrates
- β -blockers
- calcium antagonists
- potassium channel activators



Percutaneous Coronary Intervention (PCI)

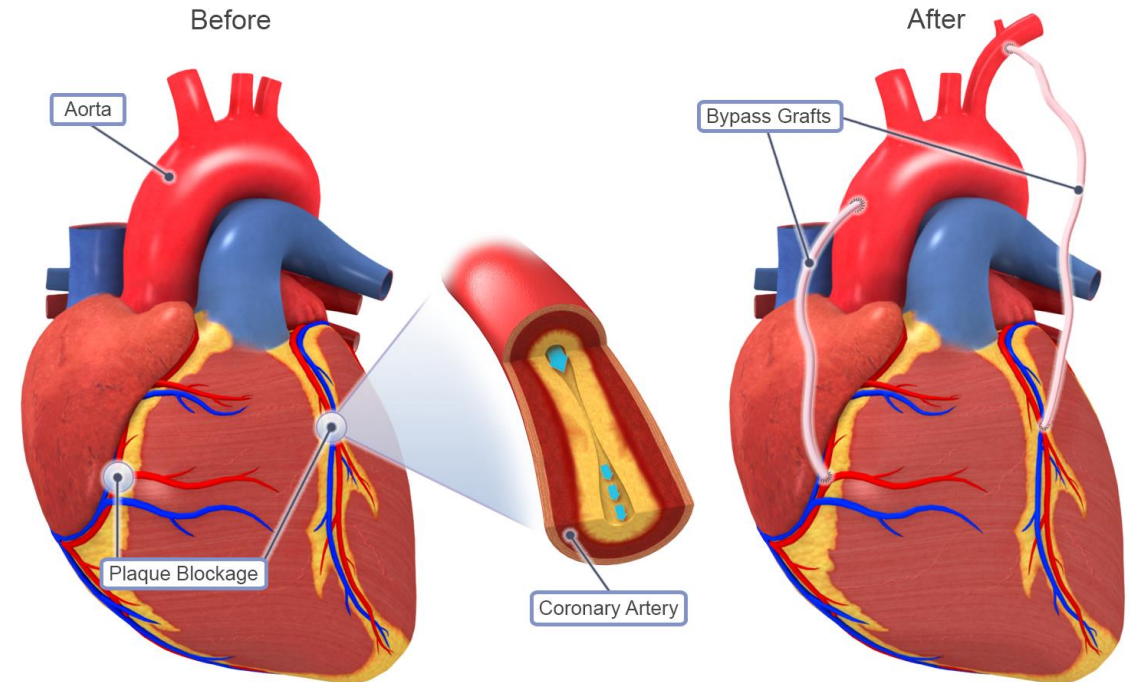


- Passing a fine **guide-wire** across a **coronary stenosis** under radiographic control
- **Balloon** is placed and then inflated to dilate the stenosis
- Then a **coronary stent** is deployed on a balloon
 - maximise and maintain dilatation of a stenosed vessel
 - reduces both acute complications and the incidence of clinically important restenosis
- Mainly used in single or two-vessel disease



CABG (Coronary Artery Bypass Grafting)

- Stenosed artery is by-passed with
 - **internal mammary arteries**
 - **radial arteries**
 - reversed segments of the patient's own **saphenous vein**
- Major surgery under **cardiopulmonary bypass**



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ASSESSMENT



- What is Angina?
- What are the types of Angina?
- What ECG Changes can be seen in Myocardial Infarction?



THANK YOU



Reference:

Text book of Pathology, Harsh Mohan