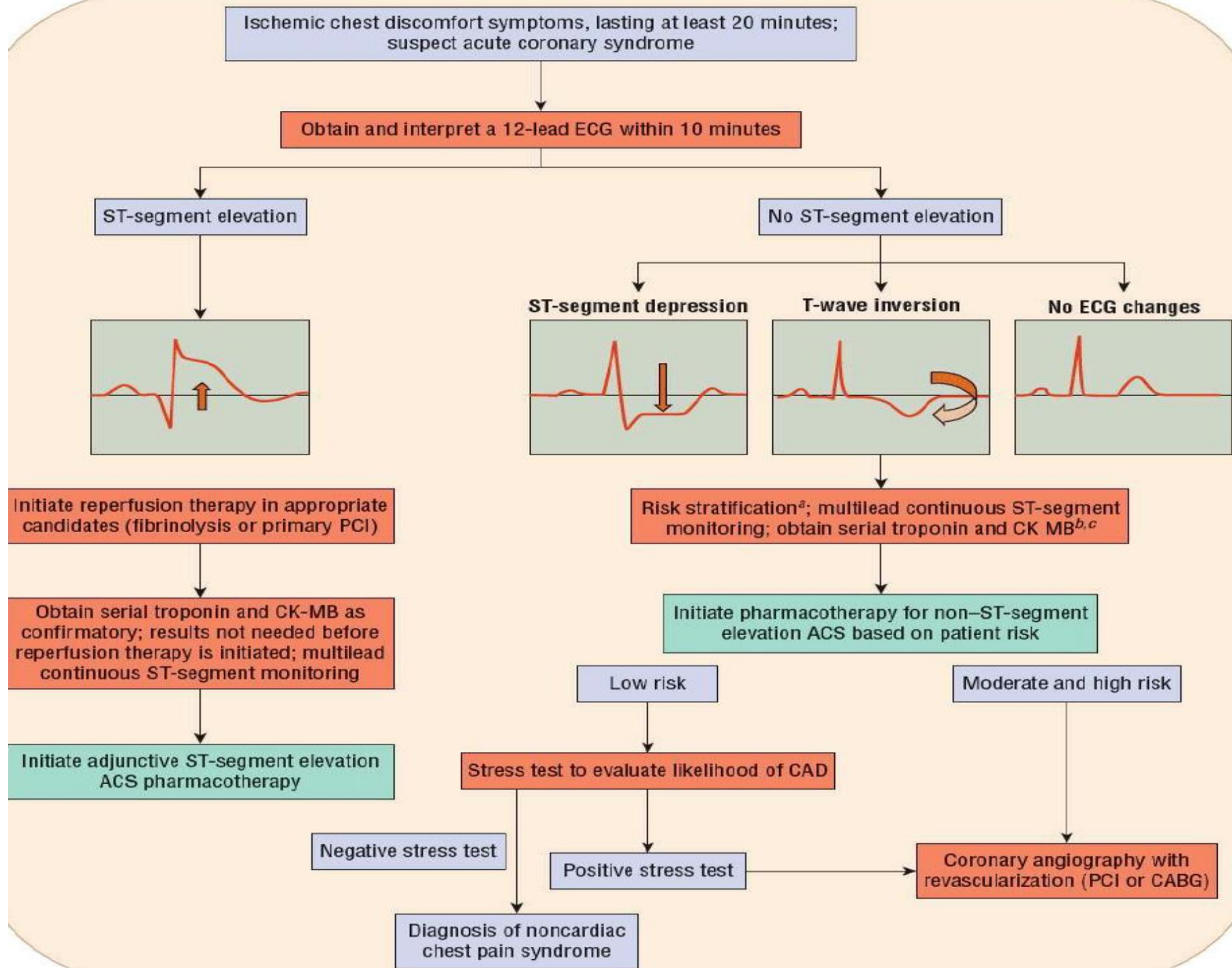


Acute Coronary syndrome

Dr Swathi Swaroopa B

- ACSs are classified according to electrocardiographic (ECG) changes into
- (1) ST-segment-elevation (STE) myocardial infarction (MI) (New STE with subsequent release of biomarkers (troponins T or I,) & creatine kinase (CK)–myocardial band (MB).
- Pathologic Q waves are frequently seen on the ECG, indicating transmural MI
- (2) Non–ST-segment elevation (NSTEMI) ACS,
 - ❑ NSTEMI (Non–Q-wave or nontransmural MI, limited to the subendocardial myocardium)
 - ❑ Unstable angina (UA).

- NSTEMI differs from UA in that ischemia is severe enough to produce myocardial necrosis resulting in the release of a detectable amount of biomarkers, mainly troponins T or I, but also CK MB, from the necrotic myocytes in the bloodstream



PATHOPHYSIOLOGY

- ☐ Rupture, fissuring, or erosion of an unstable atheromatous plaque
- ☐ Clot forms on top of the ruptured plaque
- ☐ Exposure of collagen and tissue factor
- ☐ Platelet adhesion and activation
- ☐ Promote release of adenosine diphosphate (ADP) and thromboxane A2 from platelets
- ☐ Vasoconstriction and platelet activation
- ☐ Change in the conformation of the glycoprotein (GP) IIb/IIIa surface receptors on platelets
- ☐ Cross-links platelets to each other through fibrinogen bridges (white appearance)
- ☐ Exposure of blood to the thrombogenic lipid core (rich in tissue factor) and endothelium which is rich in tissue factor
- ☐ Activation of the extrinsic coagulation cascade

PATHOPHYSIOLOGY

- ❑ Leads to the production of thrombin (factor IIa), which converts fibrinogen to fibrin through enzymatic activity
- ❑ Fibrin stabilizes the clot and traps red blood cells (red appearance of clot)
- ❑ The clot is composed of cross-linked platelets and fibrin strands
- ❑ Ventricular remodeling is a process that occurs following an MI characterized by left ventricular dilation and reduced pumping function of the left ventricle, leading to cardiac failure
- ❑ ACE inhibitors, ARBs, β -blockers, and mineralocorticoid receptor antagonists (MRAs) are all agents that slow down or reverse ventricular remodeling through inhibition of the renin–angiotensin–aldosterone system and/or through improvement in hemodynamics (decreasing preload or afterload).

❑ Formation of a fibrin clot composed of fibrin strands, cross-linked platelets, and trapped red blood cells.

Complications of MI

- Cardiogenic shock,
- heart failure (HF),
- valvular dysfunction,
- arrhythmias,
- pericarditis,
- stroke secondary to left ventricular (LV) thrombus embolization,
- venous thromboembolism, and LV free-wall rupture.

Clinical presentation

- Midline anterior chest discomfort (usually at rest),
- Severe new-onset angina, or
- Increasing angina that lasts at least 20 minutes.
- Discomfort may radiate to the shoulder, down the left arm, to the back, or to the jaw.
- Nausea, vomiting, diaphoresis, and shortness of breath
- Signs-
- STE, ST-segment depression, and T-wave inversion
- New left bundle-branch block with chest discomfort is highly specific for acute MI
- Some patients with myocardial ischemia have no ECG changes, so biochemical markers and other risk factors for coronary artery disease (CAD) should be assessed.

Clinical presentation

- Biochemical markers are important for confirming diagnosis of acute MI
- Diagnosis is confirmed with detection of rise and/or fall of cardiac biomarkers and at least one of the following:
 - (1) symptoms of ischemia;
 - (2) new significant ST-segment–T-wave changes or new left bundle branch block;
 - (3) pathological Q waves; or
 - (4) imaging evidence of new loss of viable myocardium or new regional wall motion abnormality
- Some parts of the heart are more “electrically silent” than others, and myocardial ischemia may not be detected on a surface ECG. Therefore, it is important to review findings from the ECG in conjunction with biochemical markers of myocardial necrosis, such as troponin I or T

- Troponins and CK-MB appear in the blood within 6 hours of infarction, troponins stay elevated for up to 10 days while CK-MB returns to normal values within 48 hours.
- CK-MB was used to detect reinfarction