Acute Coronary Syndrome (ACS):
Unstable Angina/ Non-ST Elevation Myocardial Infarction UA/NSTEMI

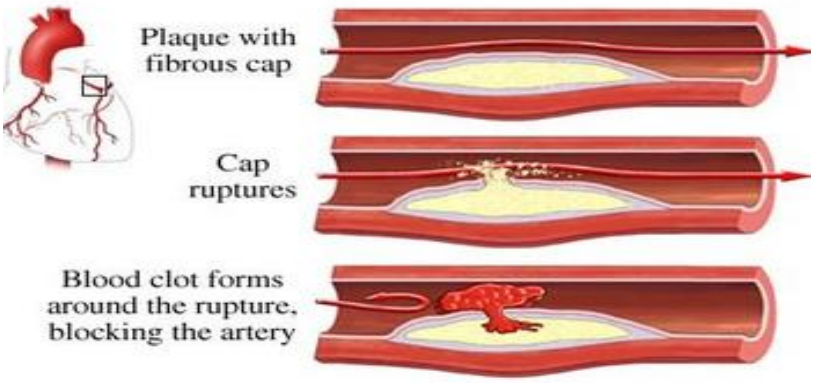
Objectives

- ACS can present as unstable angina, NSTEMI, and STEMI
- The above division is based on the ECG and s.troponin
- The difference in clinical presentation between STEMI and NSTEMI depends on whether the obstruction is complete or partial.
- Life-long medication is essential to improve long term outcomes

UA/NSTEMI

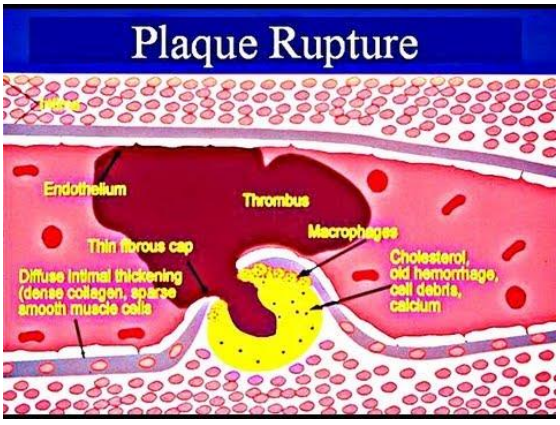
Definition:

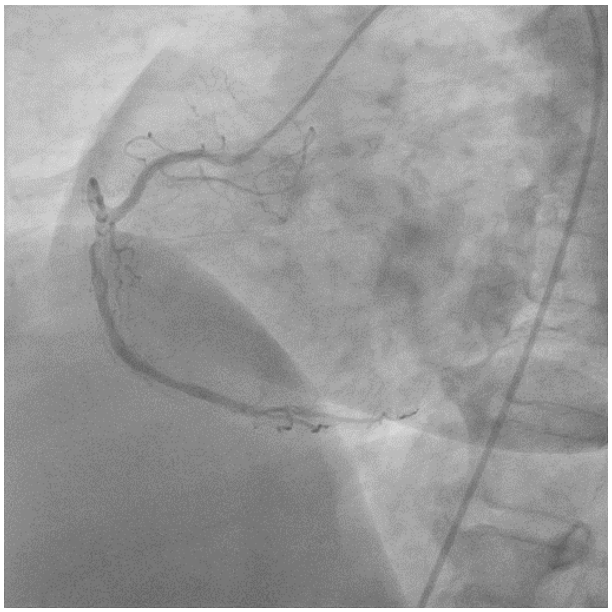
unstable angina is ischemia caused by dynamic obstruction of a coronary artery by vessel spasm or plaque rupture and superimposed thrombus

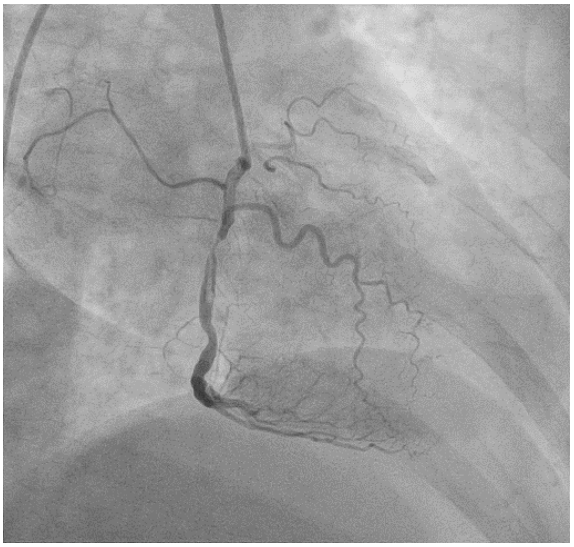


Pathophysiology

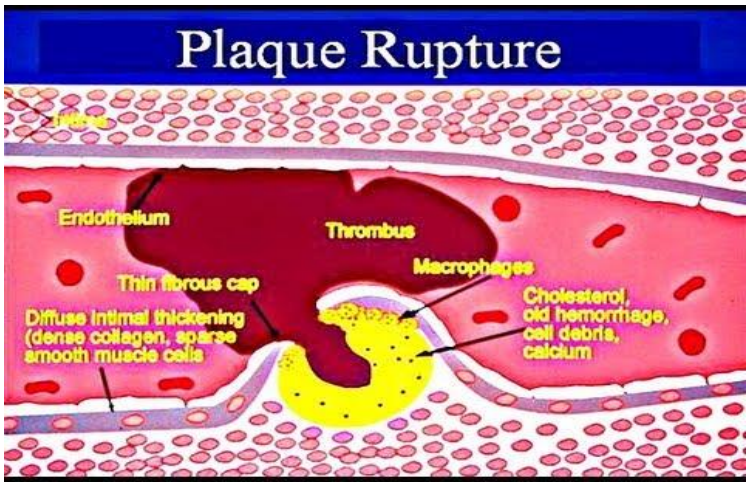
- Similar to that of acute myocardial infarction (AMI)
- Thrombus developing on top of an ulcerated, fissured, or ruptured atherosclerotic plaque



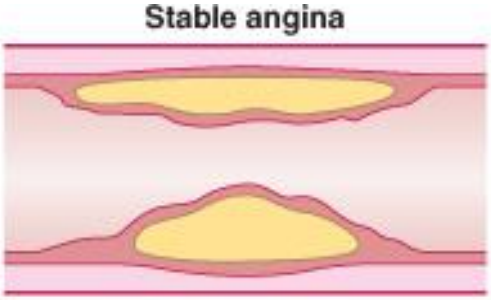


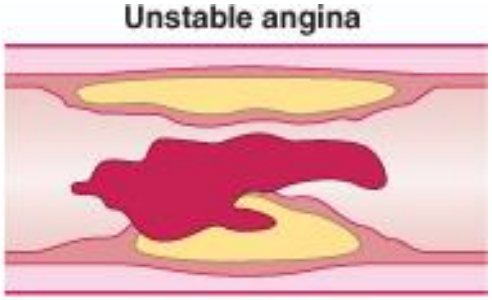


- In UA/NSTEMI, thrombus is mainly composed of platelets
- In STEMI, the thrombus is composed mainly of fibrin
- The condition is no longer an imbalance between myocardial blood supply and demand, since chest pain is present



Acute Coronary syndrome Vs Stable Angina



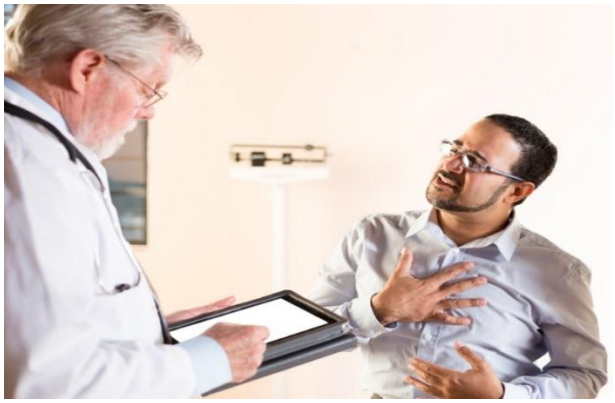


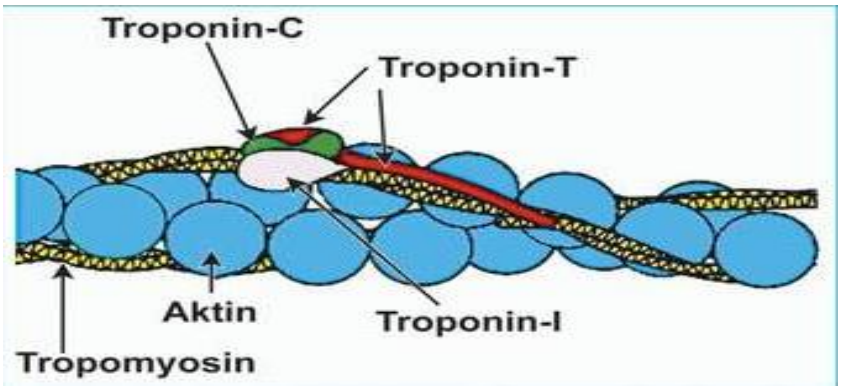
	Stable angina	Unstable angina
Pathophysiology	• Fixed stenosis	• Dynamic stenosis
Clinical features	• Demand-led ischaemia • Related to effort • Predictable • Symptoms over long term	• Supply-led ischaemia • Symptoms at rest • Unpredictable • Symptoms over short term
Risk assessment	• Symptoms on minimal exertion • Exercise testing Duration of exercise Degree of ECG changes Abnormal BP response	• Frequent or nocturnal symptoms • ECG changes at rest • ECG changes with symptoms • Elevation of troponin

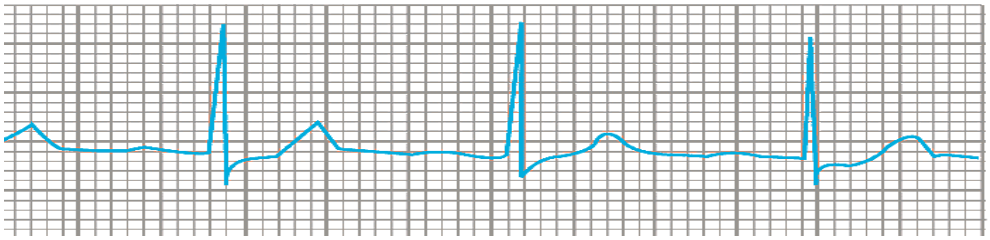
Components of ACS: Clinical Differentiation

- Unstable angina
- Non-ST segment myocardial infarction (NSTEMI)
- ST-elevation MI (STEMI)

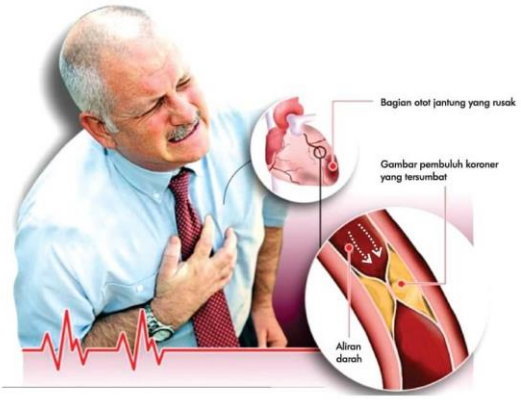
Unstable angina: pain at rest, NO ECG changes, troponin normal

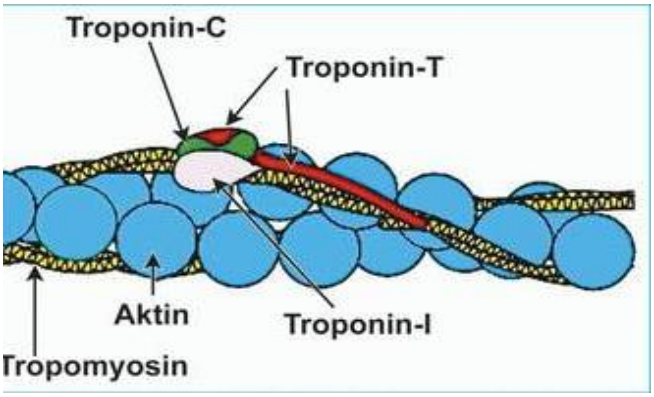


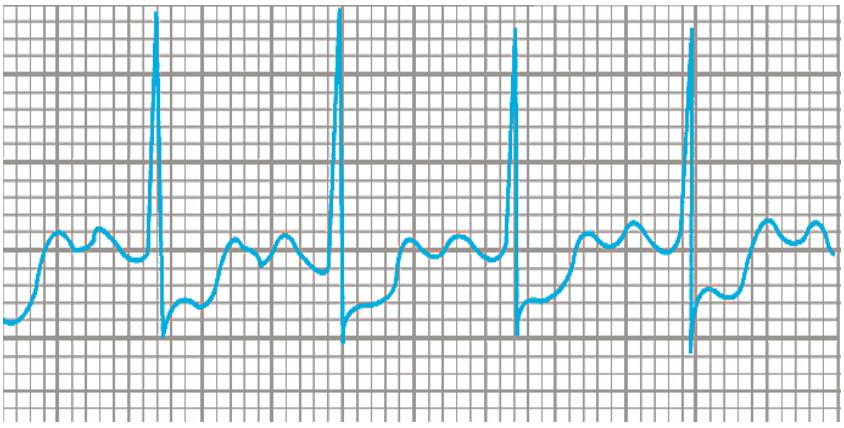


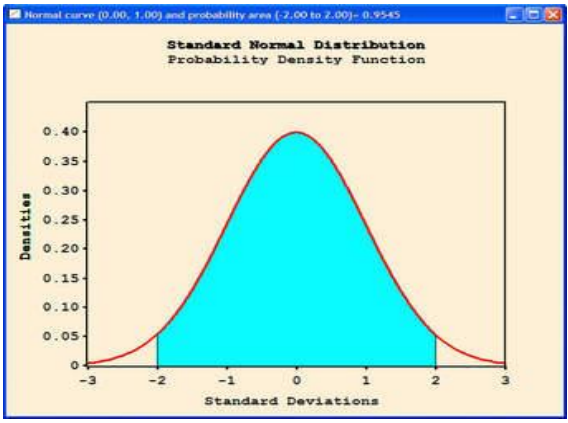


NSTEMI: chest pain, ECG normal or shows ST-Depression, troponin increased

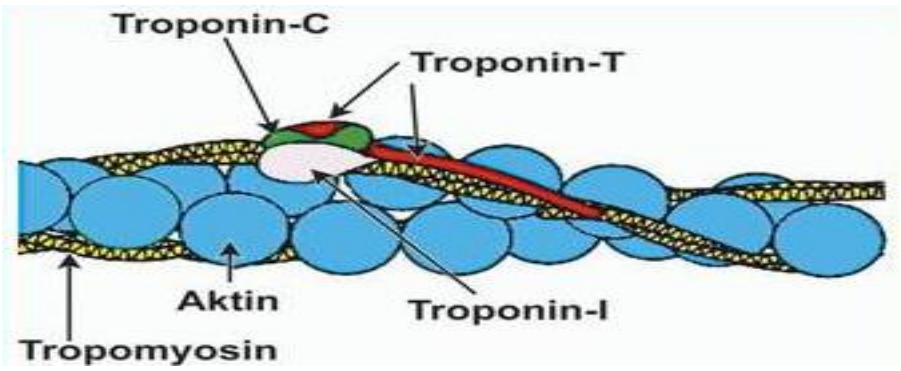


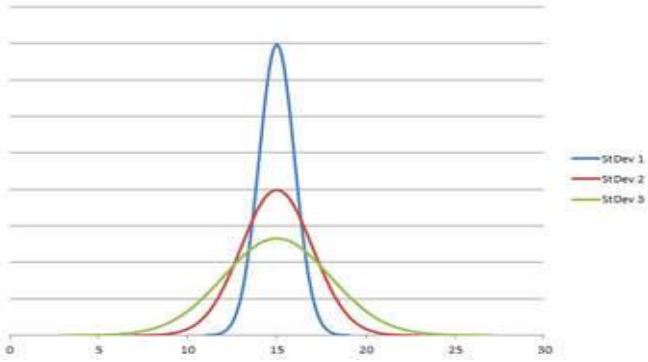


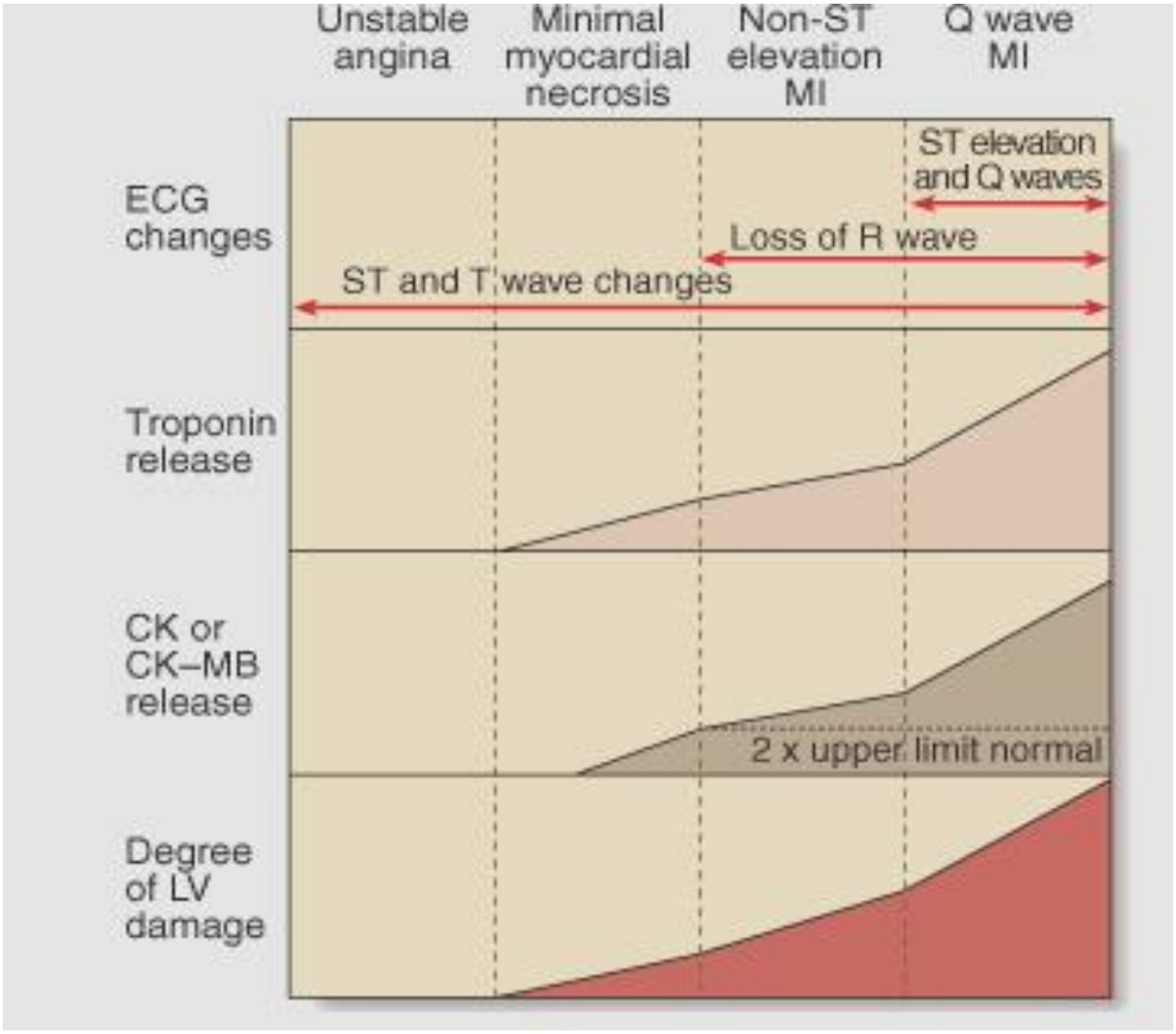




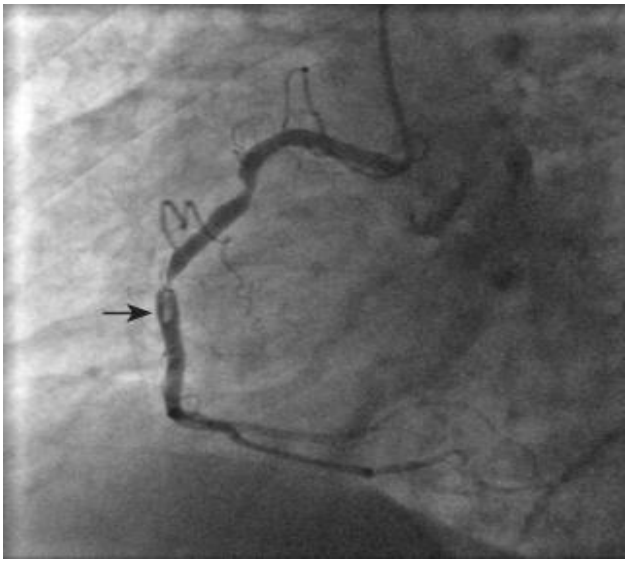
STEMI: chest pain, ECG shows ST elevation, troponin high



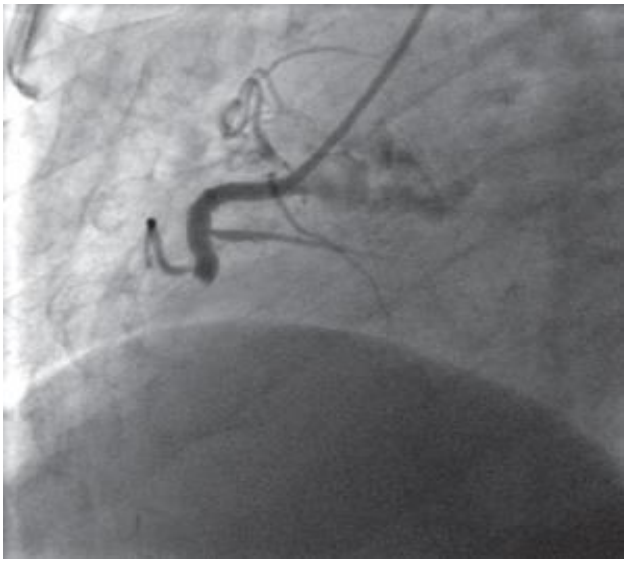




NSTEMI



STEMI



Definition

- Prolonged angina (> 20 minutes)
- New onset *(de novo)* severe angina (within 3 months)
- Recent destabilization of previously stable angina: angina at rest
- Post MI angina

Clinical Features: Symptoms

- Anginal pain
  - Rest pain
  - Nocturnal angina
  - Minimal exertion
- Sweating
- Nausea
- Abdominal pain
- Syncope

Clinical Features: Signs

Depend on the severity of the condition and the state of LV function

- Can be unremarkable
- Severe anxiety

- Pallor
- Sweating
- S3 & S4 gallop
- Crepitations

UA/NSTEMI: Risk Stratification

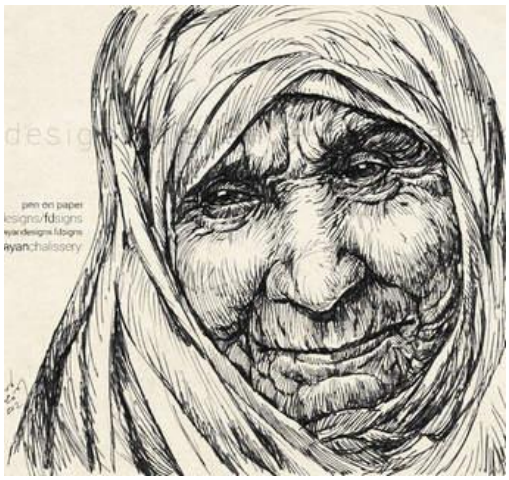
Depends on

- Clinical
- ECG
- & Biochemical criteria

Clinical Criteria of Poor Px

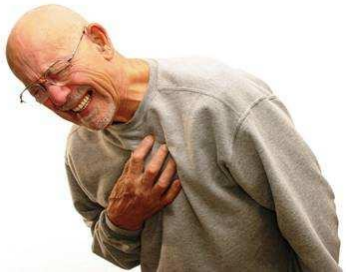
- **Old age**

*** Diabetes mellitus**



Clinical Criteria of Poor Px

- Recurrent, prolonged chest pain at rest
- Post MI angina
- Congestive heart failure
- Mitral regurgitation



ECG Criteria of Serious Disease

- **Arrhythmias**
- **Widespread ST depression**
- **Transient ST elevation (< 30 min)**

Biochemical Criteria for Px

Plasma troponin level:

- > 0.1 µg/l correlates with serious disease and poor prognosis (extensive myocardial damage)
- < 0.1 µg/l correlates with low risk

UA/NSTEMI: Management

- Urgent admission to hospital
- IV line
- Bed rest
- Oxygen if O2 saturation < 90%
- Detect and treat any precipitating condition:
  - Hypertension
  - Tachycardia
  - Anemia, thyrotoxicosis

UA/NSTEMI: Management

- Aspirin: 300 mg initially followed by 100 mg daily
- Clopidogrel
- Anticoagulation:
  - Unfractionated heparin
  - Low molecular weight heparin
  - Bivaluridin

UA/NSTEMI: Management

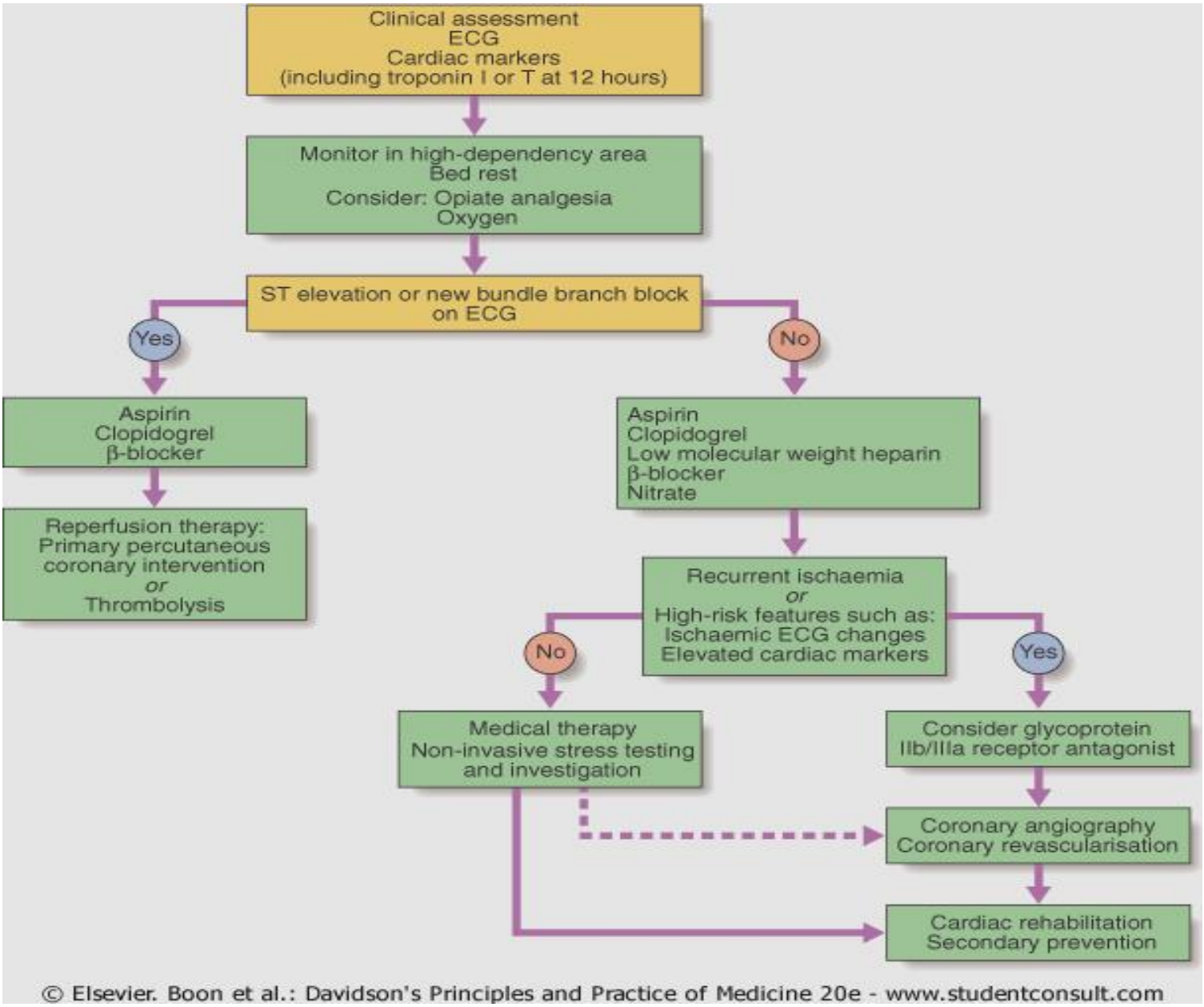
- Oral beta blockers: especially if tachycardia or hypertension without signs of heart failure
- Nitrates: oral or intravenous, according to severity.
  - Used cautiously if BP< 90mmHg

UA/NSTEMI: Management

- ACE inhibitors
- Statins

Management of the High Risk Patient

- Early invasive strategy: PCI or CABG
- Thrombolytic therapy?
  - Not useful *(why?)*
  - May be harmful



Steps in Managements

- Optimized medical treatment
- If patient is still unstable: invtervention
- If chest pain resolves: kept in hospital for 3-5 days, then before discharge ETT done at modified workload

- If predischarge ETT positive; intervention
- If predischarge ETT negative: patient sent home on treatment, then ETT repeated at full workload after 6 weeks
- If full workload ETT positive: intervention
- If negative: medical therapy, with regular check ups
- LIFELONG treatment with:
- Aspirin
- Beta blockers
- Statin
- ACE inhibitor or ARB
- In addition to one-year treatment with clopidogrel