



ISCHEMIC HEART DISEASE - 1

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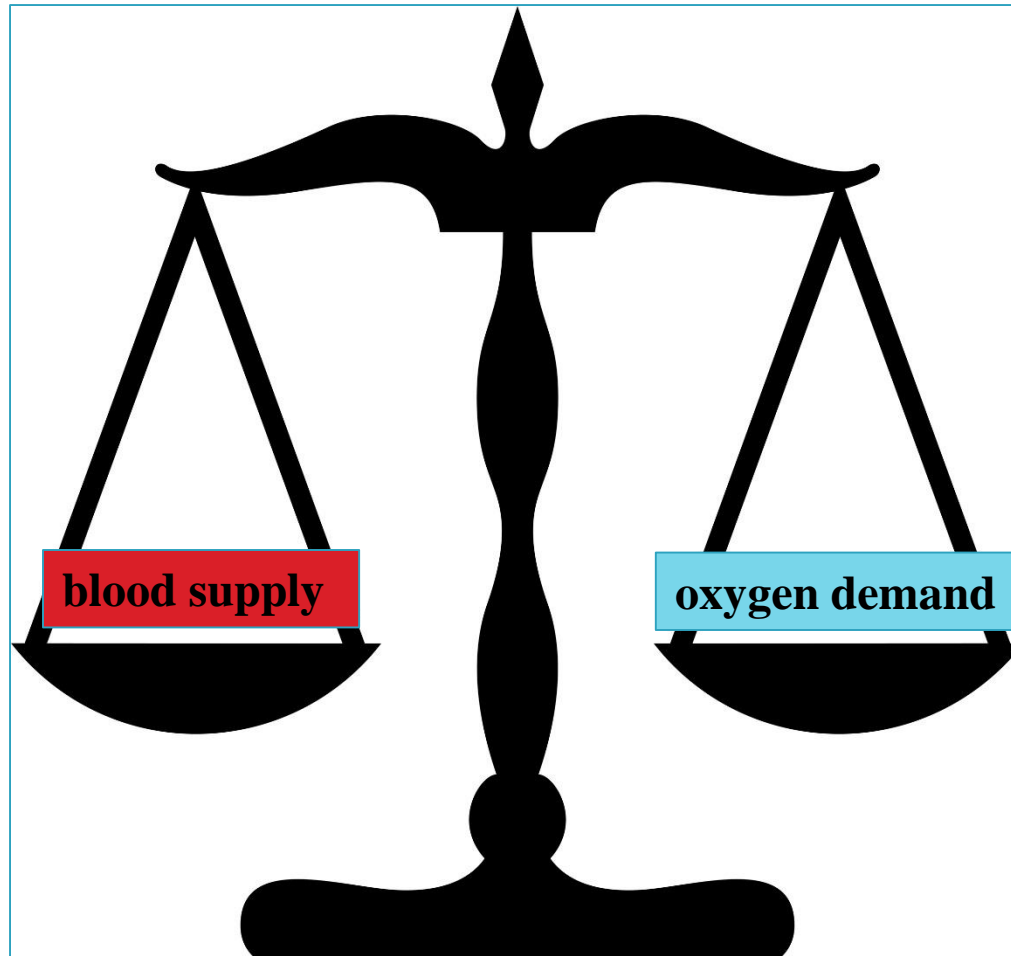
- ▶ **Heart disease is the leading cause of morbidity and mortality worldwide**



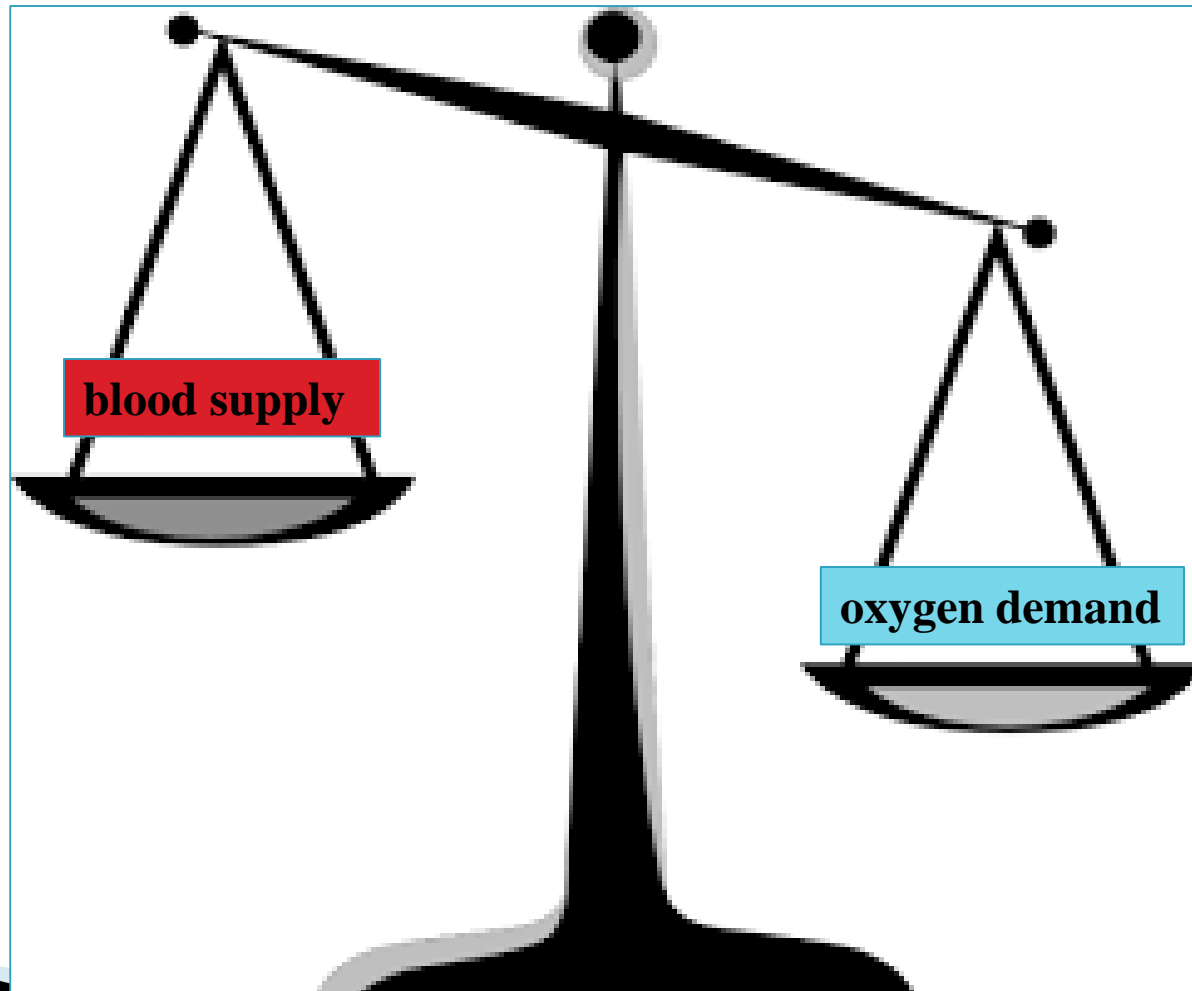
ISCHEMIC HEART DISEASE (IHD)

- ▶ IHD \approx coronary artery disease (CAD)
- ▶ IHD = a group of related syndromes resulting from **myocardial ischemia**
- ▶ imbalance between cardiac blood supply (perfusion) and myocardial oxygen demand

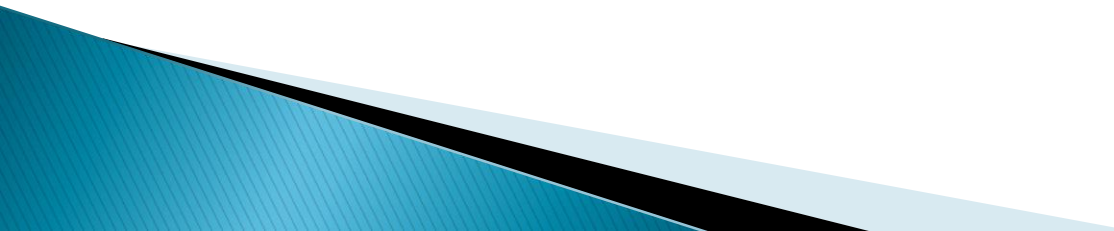
Normally ...



myocardial *ischemia occurs when:*



Ischemia can result from:

- 1- **reduction in coronary blood flow (90%)**
(e.g. atherosclerosis)
 - 2- **increased demand** (e.g., tachycardia or hypertension)
 - 3- **diminished oxygen-carrying capacity**
(e.g., anemia, CO poisoning)
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There are four basic clinical syndromes of IHD:

1-Angina pectoris

ischemia causes pain but is insufficient to lead to death of myocardium

2-Acute myocardial infarction (MI)

the severity or duration of ischemia is enough to cause cardiac muscle death

3-Chronic IHD

**progressive cardiac decompensation
(heart failure) following MI**

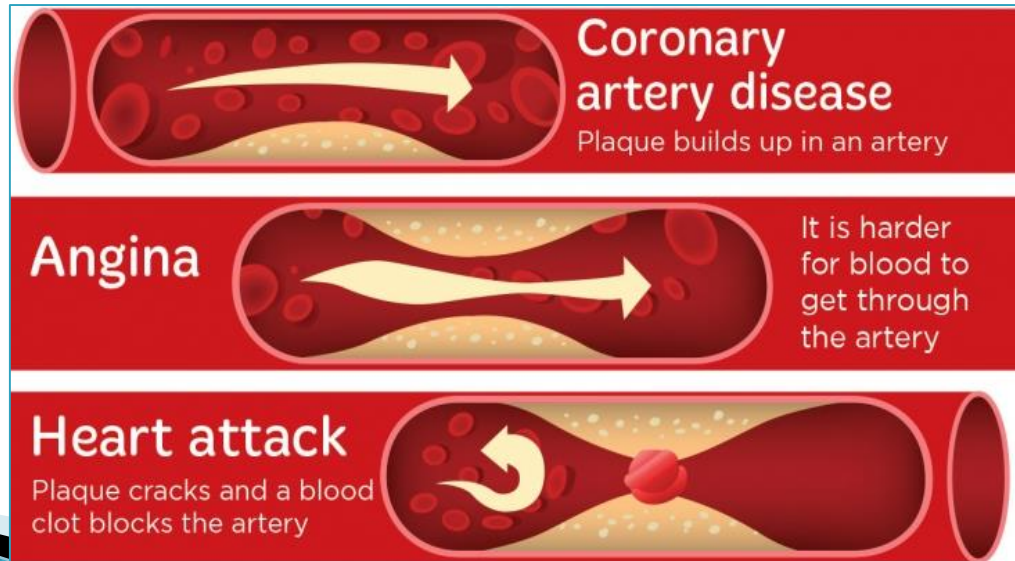
4-Sudden cardiac death (SCD)

**can result from a lethal arrhythmia
following myocardial ischemia**



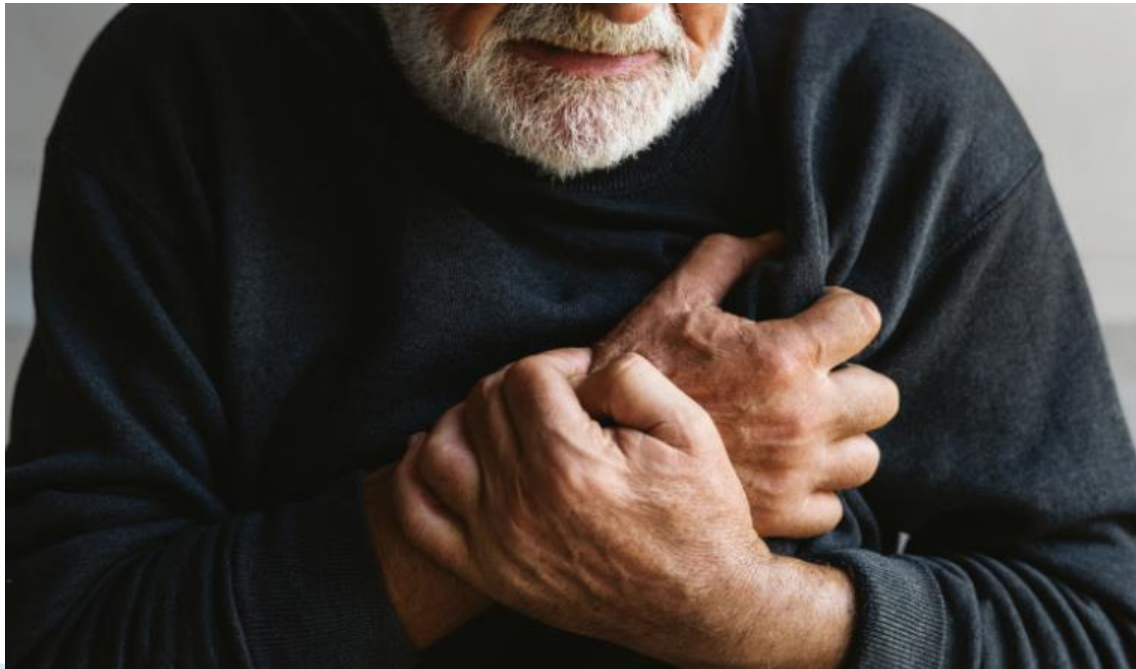
1-Angina Pectoris

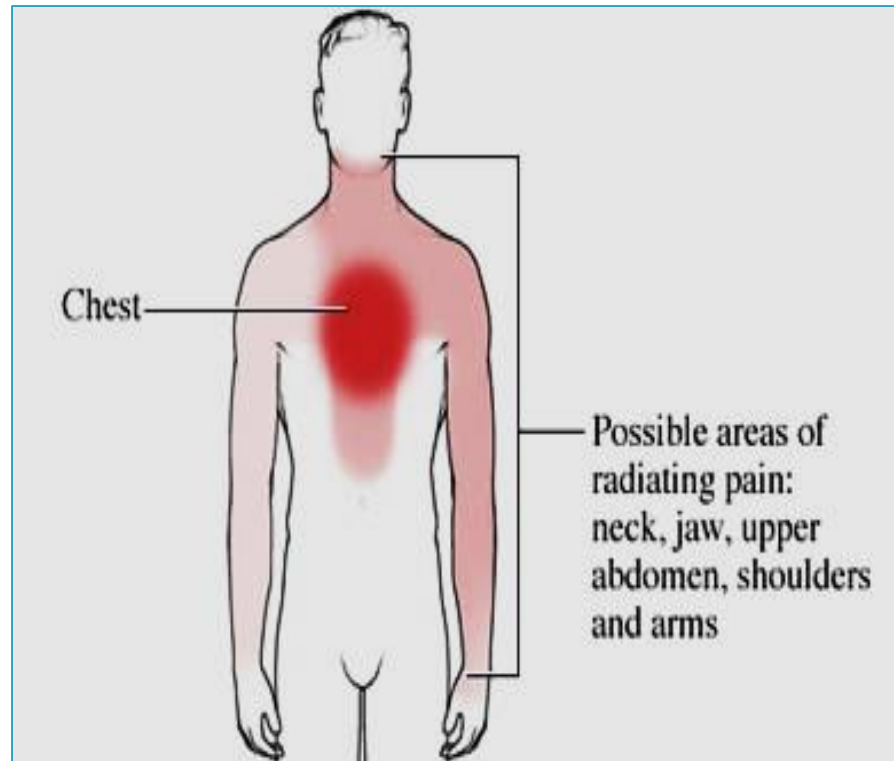
- intermittent chest pain caused by transient, reversible myocardial ischemia (**ischemia causes pain but is insufficient to lead to death of myocardium**)



Angina pain

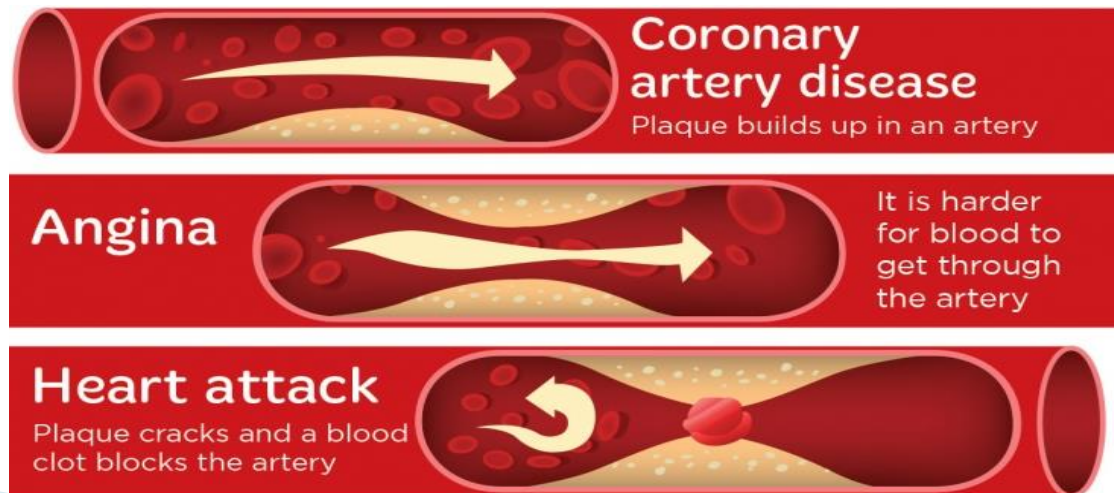
a crushing or squeezing substernal pain
; radiates down the left arm or to the left jaw (*referred pain*).





Pain in Angina versus MI

- ▶ **angina pectoris** → < 20 minutes & relieved by rest or nitroglycerin
- ▶ **MI** → > 20 minutes to several hours & is not relieved by nitroglycerin or rest



Types of angina :

1-stable angina

**2-variant angina or Prinzmetal
angina**

3-Unstable angina



Pathogenesis of Angina (depends on type):

1- critical stenosis:

- in stable angina
- pain only with increased demand

2- severe coronary vasospasm:

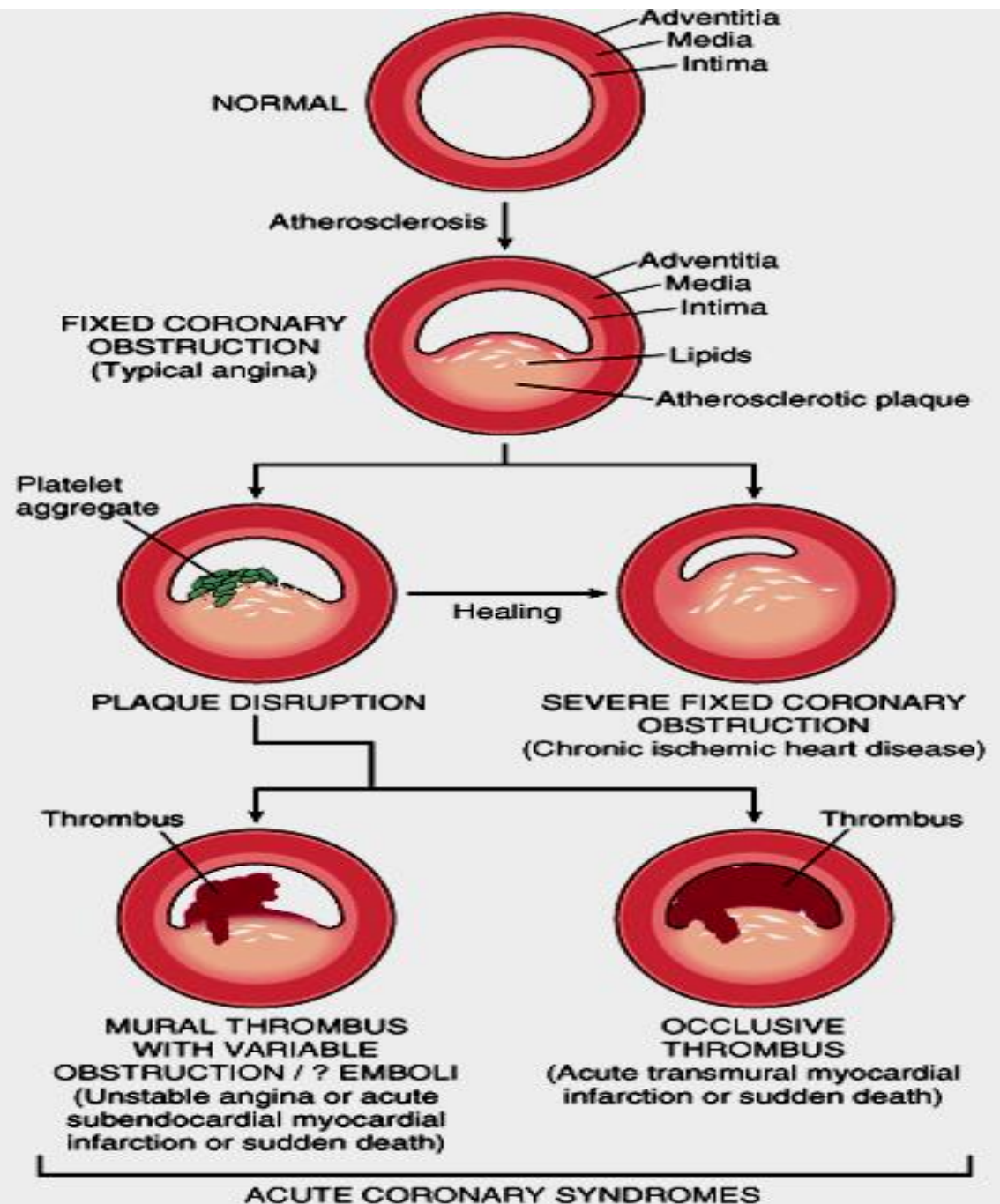
- in Prinzmetal angina

Pathogenesis of Angina (depends on type):

3- critical stenosis with superimposed Acute Plaque Change*:

- in unstable angina
- *Acute Plaque Changes: plaque disruption; superimposed partial thrombosis; distal embolization; or vasospasm.
- ▶ Myocardial infarction → a superimposed occlusive thrombus

Pathogenesis



1-Typical (stable) angina

- episodic chest pain
- ↑ myocardial oxygen demand (e.g. exertion; tachycardia; hypertension; fever, anxiety, fear)
- critical atherosclerotic narrowing
- relieved by rest (reducing demand) or by drugs (e.g. nitroglycerin)

2-Prinzmetal (variant) angina

- **Occurs at rest or sleep**
- **Due to coronary artery spasm**
- **vessels without atherosclerosis can be affected**
- **etiology is not clear**
- **Treatment: vasodilators (nitroglycerin or calcium channel blockers)**

3-Unstable angina (crescendo angina)

- Causes: plaque disruption; superimposed partial thrombosis; distal embolization; or vasospasm
- more **intense** and **longer** lasting than stable angina
- **↑ frequency** of pain; precipitated by ↓ exertion
- Usually precedes more serious, potentially MI (irreversible ischemia), thus it is called: ***pre-infarction angina***