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THE UNIVERSITY OF JORDAN

ISCHEMIC HEART DISEASE - 1

* Angina Pectoris

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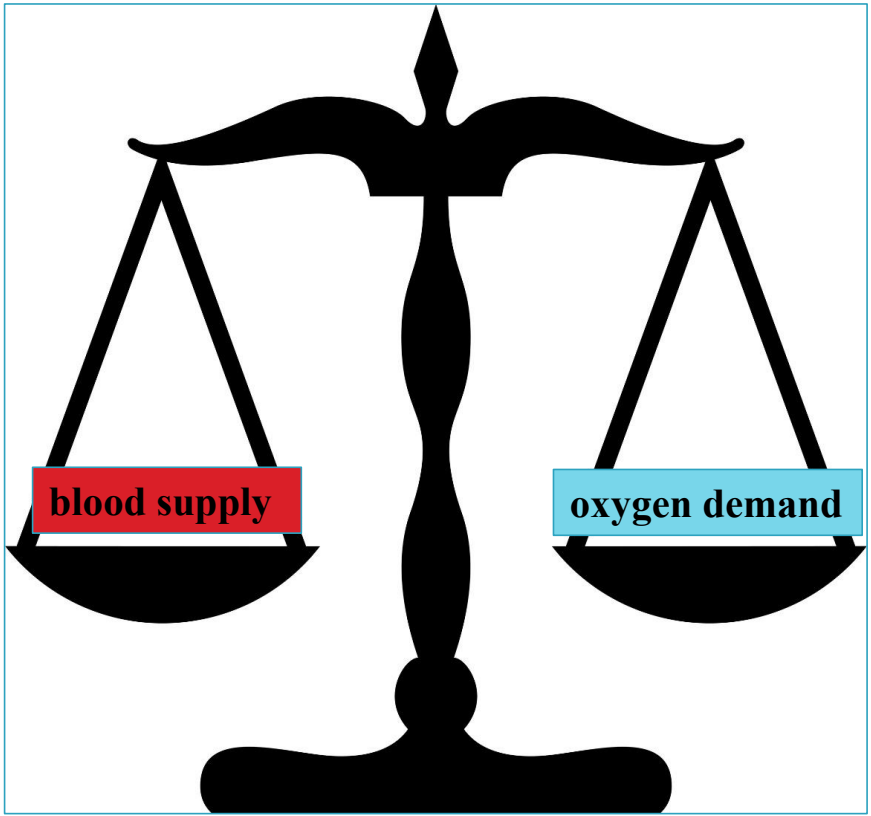
- **Heart disease is the leading cause of morbidity and mortality worldwide**

ISCHEMIC HEART DISEASE (IHD)

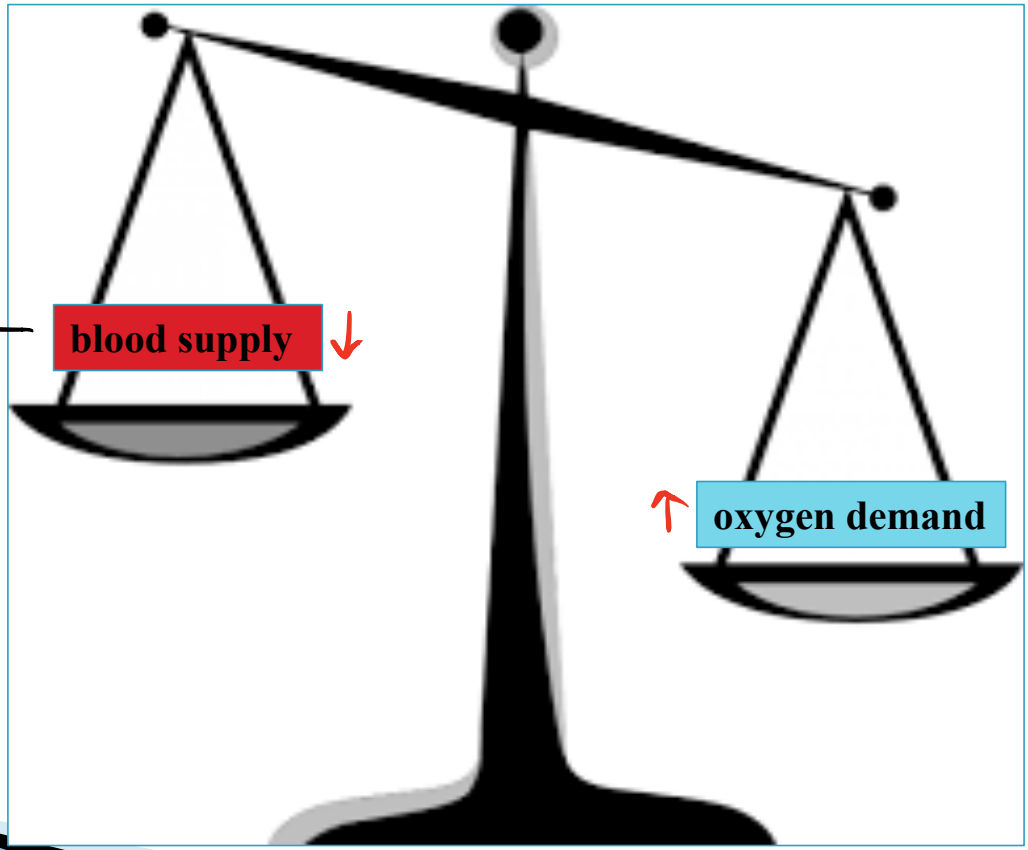
- IHD ≈ coronary artery disease (CAD)
  - in most cases
  - → is the cause of IHD.
- IHD = a group of related syndromes resulting from myocardial *ischemia*
- imbalance between cardiac blood supply (perfusion) and myocardial oxygen demand

Normally …



myocardial *ischemia occurs when:*

Imbalance.



Major cause
More common

Ischemia can result from:

1- reduction in coronary blood flow (90%)
(e.g. atherosclerosis)

2- increased demand (e.g., tachycardia or hypertension) Hypertrophy

3-diminished oxygen-carrying capacity
(e.g., anemia, CO poisoning)

very rare to happen

↓
Has higher Affinity to Haemoglobin than O_2

There are four basic clinical syndromes of IHD:

1-Angina pectoris الذبحة الصدرية

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

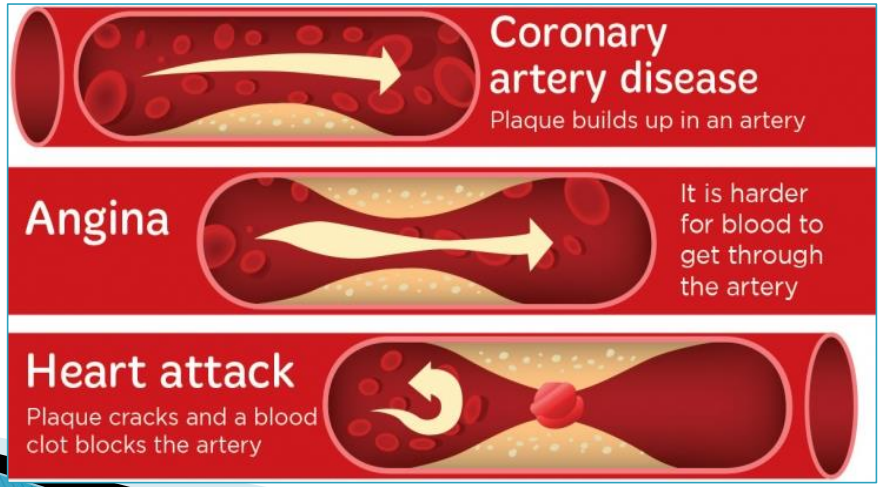
progressive cardiac decompensation (heart failure) following MI

4-Sudden cardiac death (SCD)

can result from a lethal arrhythmia following myocardial ischemia (Next Lecture)

1-Angina Pectoris

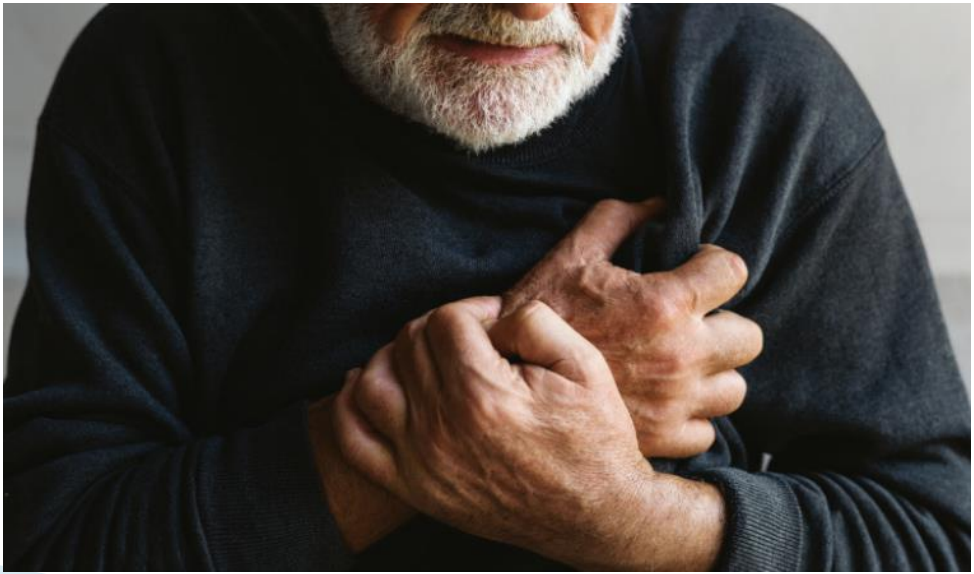
- intermittent chest pain caused by transient, reversible myocardial ischemia (**ischemia causes pain but is insufficient to lead to death of myocardium**)



Atherosclerosis.

Angina pain

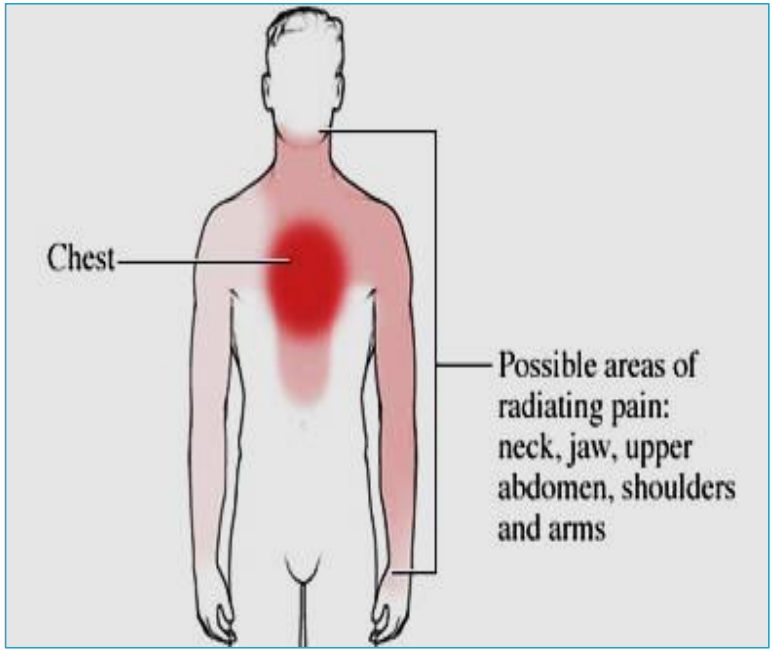
a crushing or squeezing substernal pain
; radiates down the left arm or to the left jaw *(referred pain).*



what is the difference between Angina & MI? → Both of them related to ischemia
↘ Both of them experienced as pain

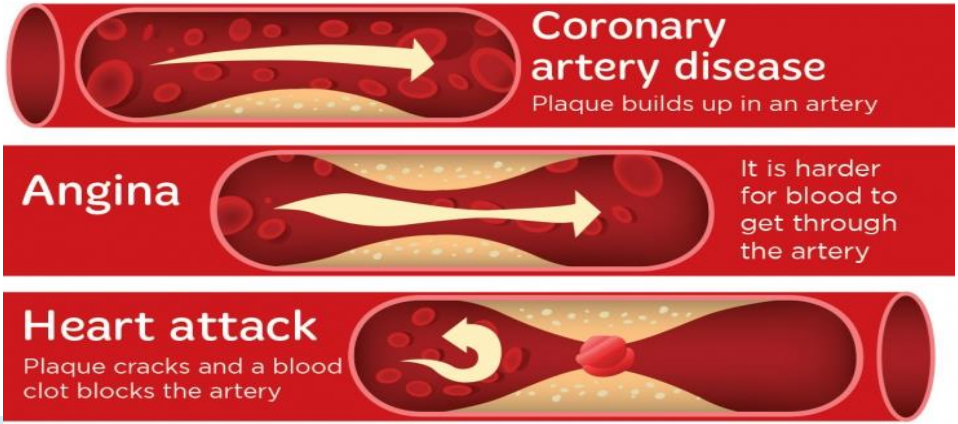
Angina → Reversable.

MI → Nonreversable



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 : Differ in Pathogenesis.

1-stable angina Critical Stenosis

2-variant angina or Prinzmetal angina Severe coronary vasospasm.

3-Unstable angina Critical Stenosis with superimposed Acute plaque change.

Pathogenesis of Angina (depends on type):

1- critical stenosis:

- **in stable angina**
- **pain only with increased demand**

2- severe coronary vasospasm:

- **in Prinzmetal angina** → Variant 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.**

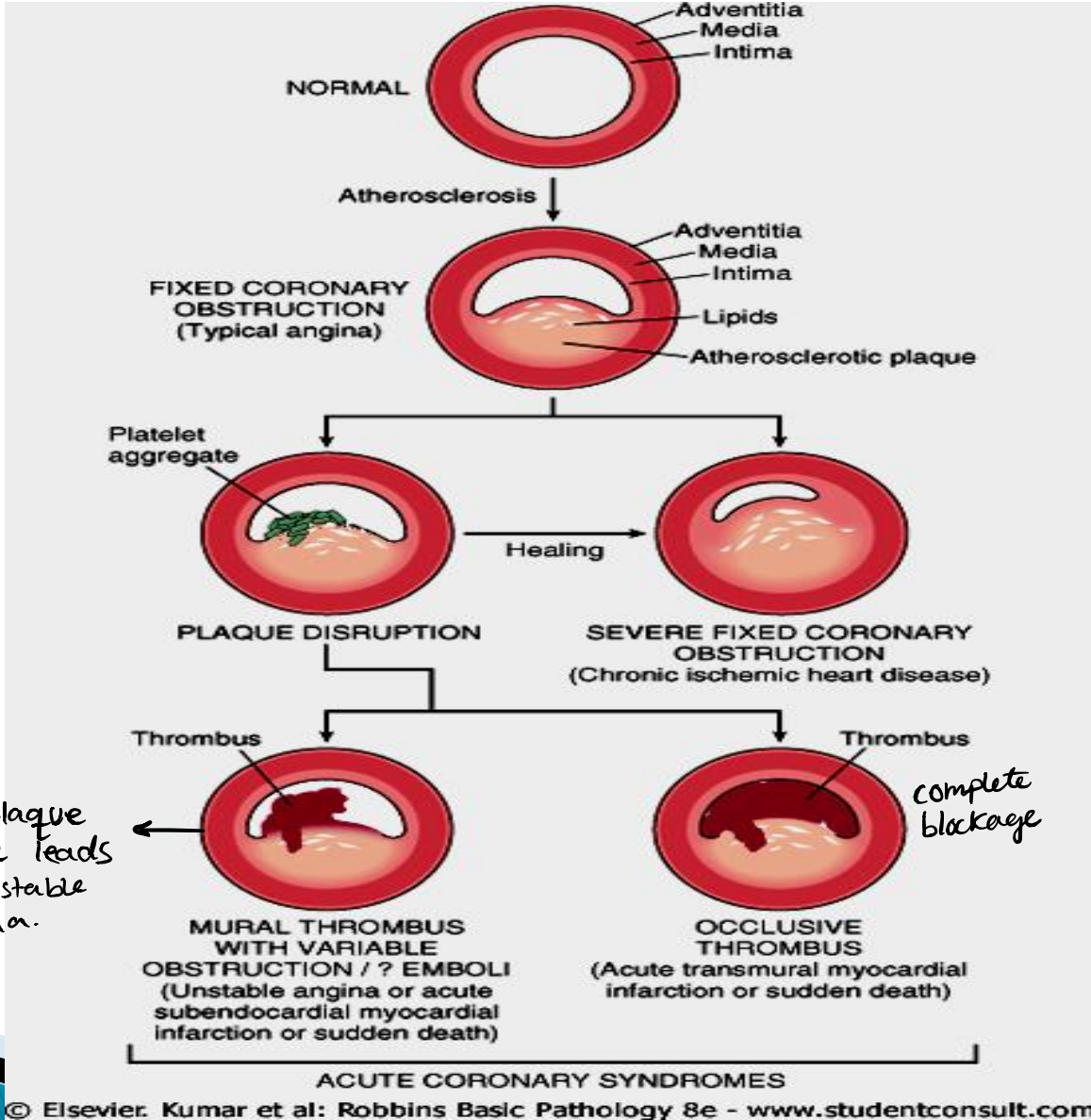
① rupture

→ causing occlusion in narrower place.

* Coronary Artery already has Atherosclerosis and has reached critical stenosis, and for some reason acute change happen.

- **Myocardial infarction → a superimposed occlusive thrombus**

Pathogenesis



Partial Acute plaque change leads to unstable Angina.

complete blockage

1-Typical (stable) angina

As long as there is balance with oxygen demand and blood supply patient will not experience symptoms.

- episodic chest pain
- ↑ myocardial oxygen demand (e.g. exertion; tachycardia; hypertension; fever, anxiety, fear)
- critical atherosclerotic narrowing → Narrowing >75% is occluded.
- relieved by rest (reducing demand) or by drugs (e.g. nitroglycerin) → Reset the balance.

↓
Vasodilator.

2-Prinzmetal (variant) angina

Not common.

- 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)

already there is Atherosclerosis, now we have sth. superimposed.

- Causes: plaque disruption; superimposed partial thrombosis; distal embolization; or vasospasm (Mentioned earlier)

Pain is

- 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***

ischemia → Necrosis of myocardium (MI)