

Referred pain areas

- Inter-capsular area can indicate:
 - **Heart**
 - Aorta
 - Duodenum [Penetrating duodenal ulcer]
- Tip of the right scapula;
 - Very specific to the gallbladder
- Small intestine;
 - Umbilical region

Rules of DDX

- Transformation of history and physical to DDX
 - 1- Common is common
 - 2- You need to always keep an eye on the most dangerous causes
 - 3- **UNIVERSAL DX** = Dx that sums up most of your constellation of signs and symptoms = Probably constitute of 2 DXs
 - 4- There are no absolutes in medicine
 - ◆ For instance. A patient could come to you, a cardiology consult before for major dental problem of **Jaw pain** then turned to have very tight LAD! = Very atypical case = **THERE'S NO ABSOLUTES IN MEDICINE = THINK OUTSIDE OF THE BOX**

Autonomic response to chest pain;

- Big anterior MI = Anterior descending artery = Sympathetic stimulation
- RCA = inferior MI = Parasympathetic activation = Nausea and vomiting
- Sympathetic activation is more common in MI [AKA more sweat secretion]
- 2 major groups in risk to for silent MI = **Elderly** and **diabetes**
 - The signs => Angina equivalent => SOB and Dyspnea

Sources of chest pain:

- **Heart**
 - Ischemia [Burden on heart]
 - Dissection of aorta
 - Pericarditis
- **Inflammation**
 - Pneumothorax
- **Infection**
 - Pneumonia
- **Obstruction**

- Asthmatic attack
- **GI**
 - Ulcer
 - Gallbladder problem
 - Reflux
 - Spasm
- **MSS**
 1. Muscles and joints = Osteoarthritis, trauma
 2. Skin = Herpes zoster
 3. Nerves = Disk
- **1-** How to differentiate between Complete obstruction and incomplete obstruction?
 - ECG would show ST elevation MI in the case of complete obstruction.
- **2-** What would the ECG show in the case of pericarditis?
 - ECG would show diffuse ST elevation
- **3-** Then how to differentiate between them?
 - Symptom-wise
 - ◆ Character of pain?
 - ◇ Pericarditis = More somatic
 - Eases with leaning towards and etc
 - **ALWAYS KEEP IN YOUR MIND; THERE ARE NO ABSOLUTES IN MEDICINE**
 - ◆ Treatment;
 - ◇ Tx for pericarditis: Colchicine and NSAIDs
 - ◇ Tx for MI: Cath and anticoagulants
 - ◇ NSAIDs is contraindicated in MI = Thrombin increased / ? / ?
 - ◇ Anticoagulants are contraindicated in Pericarditis
 - ◇ In essence, YOU HAVE TO BE CERTAIN ABOUT THE DX BEFORE GIVING ANY MEDICATION.
 - How to be certain?
 - **Bedside echo**
 - ▲ A- If the it shows no motional abnormality = No heart attack [Systolic failure should happen before]
 - ▲ B- If it shows Fluid = Pericarditis

Approach to chest pain;

- The big question before every other question; **Is it one of the deadly 4**

1. MI

- **How does the chest pain in a patient with acute MI present?**
 - ◆ Ischemic pain. This ischemia pain falls under a spectrum either

a spectrum of disease progression or the pain itself.

- ◆ Spectrum:
 - ◇ Begins with Stable angina pain [Ex: 70% blockage of LAD artery] => Pain will be
 - 1- **Pressure-like heaviness [Elephant بلاطة etc]**
 - 2- Retrosternal
 - 3- Radiates up to the left arm ==> up to the left jaw.
 - 4- Increases with exertion and relieves with rest.
 - 5- **When this presentation of pain presents for longer than 3 months => Think Stable angina!**
 - ◇ When the pain acceleratively becomes more severe, more frequent, lowered threshold of physical activity causes it => **Then think unstable angina!**
 - ◇ Stable angina at rest is considered unstable. [Variant angina?] Can have elevated [**Troponin = Non-STEMI**]
 - ◇ Worsening signs of stable angina that warns it's progressing to unstable angina:
 - Less responsiveness to nitrates = Stable becomes unstable at the brink of becoming MI = One of the dead 4 is being manifested that's why this warning sign is of significant importance!
- ◆ Sympathetic activation is more common in MI [AKA more sweat secretion]

2. Pulmonary Embolism:

- **How does the chest pain in a patient with PE present?**
 - ◆ Character of pain? = Depends on the *size*
 - ◇ **Small:** NOT of deadly 4 Initially it's —> Asymptomatic until the showering of the emboli becomes significant causing **Pulmonary HTN** Putting a strain on the **Right ventricle** = Pain becoming cardiac-like!
 - How to differentiate between the cardiac-like pain of Small PE and other cardiac causes
 - Important for DDX: PE will have Hypoxia and NO HYPOTENSION.
 - ◇ **Medium:** NOT of deadly 4,
 - Pain = Sharp pleuritic in character that can present in both the left and the right sides
 - For DDX: Hypoxia and tachycardia
 - ◇ **Large:** One of the deadly 4
 - It causes a Central Cardiac ischemia that is **an almost a heart attack!**
 - Why does it cause pain?
 - It puts a Large burden/strain on the right ventricle causing Ischemia = Pain

- How to differentiate between massive PE and regular MI
 - ◆ ECG
 - ◆ O₂ = Hypoxic in PE
 - ◆ No left ventricle failure and edema!
 - ◆ BP = Hypotensive
 - ◇ But hypotension can also be present in inferior MI! How to differentiate?
 - ◇ Elevated JVP → Sign of volume overload → **LVF**
 - ◇ Crackles in the lung → **LVF**
- What is the most common finding of PE in ECG?
 - ◆ Answer: **Sinus tachycardia**
 - ◇ S1Q3T3" pattern of acute cor pulmonale is classic; this is termed the McGinn-White Sign. A large S wave in lead I, a Q wave in lead III and an inverted T wave in lead III together indicate acute right heart strain.

3. Aortic dissection

- Character of pain?
 - ◆ **Tearing** chest pain comes Very suddenly and is in maximum severity since the very beginning. Radiates to the **back**
 - ◆ Other signs that makes me suspect AD:
 - ◇ Differences in pulse in both arms = Radio-Radial and **rarely** Radio-Femoral.
 - ◆ **Timing:** HTN is the most common cause of AD but ultimately the patient presents with hypotension. Why?
 - ◇ As time passes → The heart begins to compensate and the patient could enter shock → hypotensive
 - ◆ **Potential associated symptoms** to AD:
 - ◇ Syncope
 - Why?
 - 1- Hypotension = Cerebral hypo-perfusion
 - 2- Both carotids become compromised
 - 3- **Right coronary ARTERY inferior STEMI** [NOT LAD to heart so Superior STEMI]
 - ▲ How to differentiate between inferior-MI closure to ostium by the AD to true one ??
 - △ History [Marfan]
 - △ Radio-radial exam = Aortic dissection
 - △ Chest X-Ray = widened mediastinum = AD
 - △ Echo
 - △ Cardiac enzymes
 - △ Other tests aren't related so closely to this

4. Tension pneumothorax

- Character of pain?
 - ◆ Pleuritic
- Associated: Hypoxia and SOB

- Physical exam:
 - ◆ Hyper-resonance
 - ◆ Absent breath sounds
 - ◆ Tracheal deviation

Other than the fours:

- Pericarditis = Sharp pleuritic pain
 - Increases with breathing
 - Increases with lying back and relieves with lying toward = بتدليل The heart and the friction to the pericardium decreases.
- History of viral infection 2 weeks before ?
 - Potential causative agents:
 - ◆ **coxsackievirus** and **Adenovirus** and newly corona can cause it.
- Pericarditis presents classically with pain. Myocarditis is classically **painless** UNLESS there was superimposed pericarditis → Myo-pericarditis.
- Myocarditis typically presents with heart failure symptoms [It causes weakening in the heart muscle after-all]
- Endocarditis is very different to the previous 2. It's a valvular heart disease → Destruction to the heart valves happen -> Sepsis, Fever, Embolism can all occur here.
 - Because it causes embolism → **PAIN HAPPENS.**
- Aortic stenosis, HOCM, Pulmonary HTN, Subendocardial ischemia? → Can cause heart strain → Subendocardial ischemia → Pain similar to ischemic pain.
 - Do angiography.