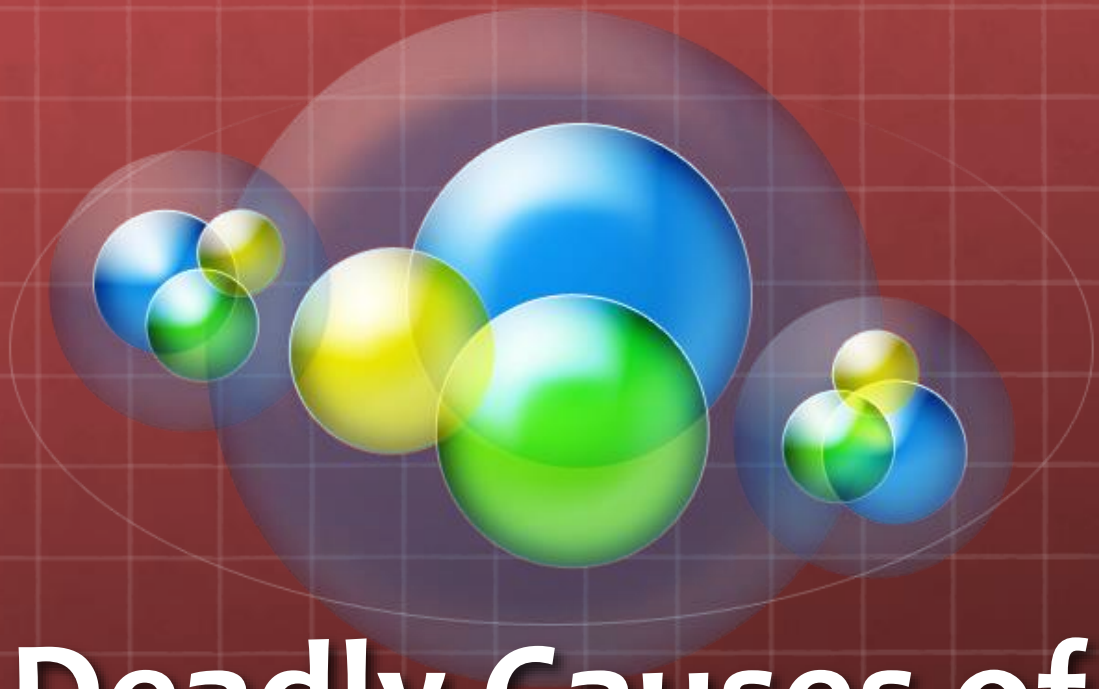

Deadly Causes of Chest Pain

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What are the 6 causes of chest pain that can kill?

Case

56 yo M with DM, HTN, and tobacco use complains of Chest Pain while in the CDU

Key Initial Evaluation

- **Gen Appearance** (diaphoresis = bad)
- **Vital Signs** (hypotension = bad)
- **Heart** (Muffled? Regular? Fast?)
- **Lungs** (Equal? Wet? Wheezing?)
- **Extremities** (=pulses?, ⬇cap refill = bad)

➢ **Any bad sign = ABC's and call CDU doc**

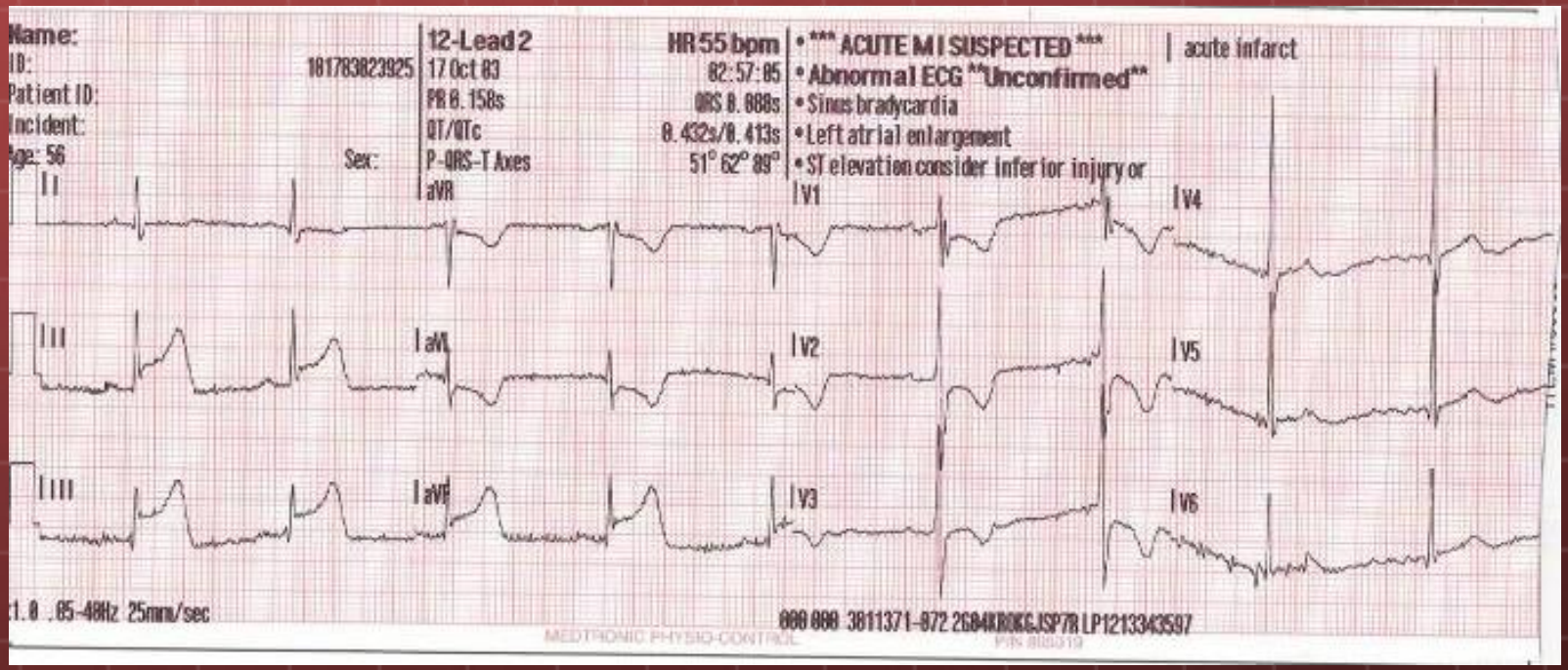
Key Initial Evaluation

- ***EKG for all ; CXR for most (portable)**

Get more information

- **Location:** Central, left, or right
- **Radiation:** Back, neck, arm
- **Assoc symptoms:** SOB, nausea
- **Timing:** Gradual or sudden onset
- **Provocation:** What makes worse or better?
- **Severity:** Scale of 1-10

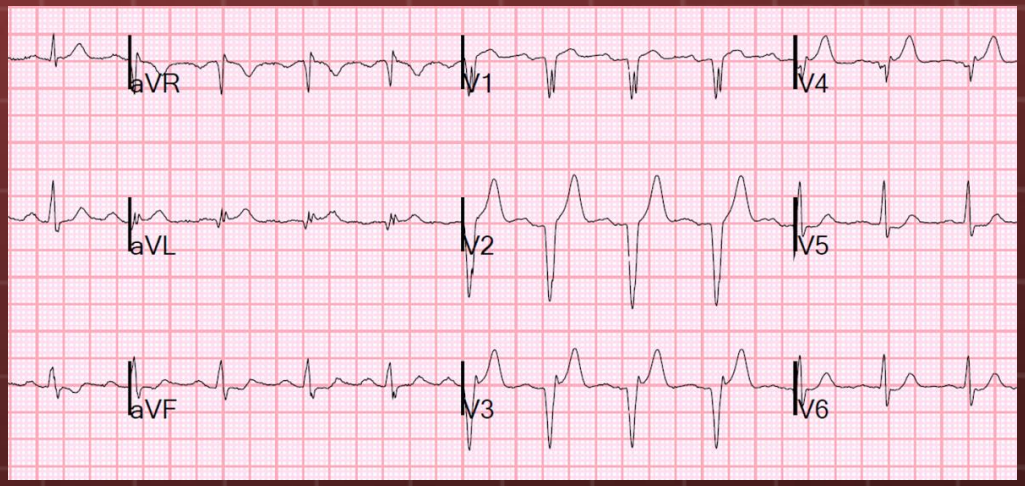
ACS = STEMI

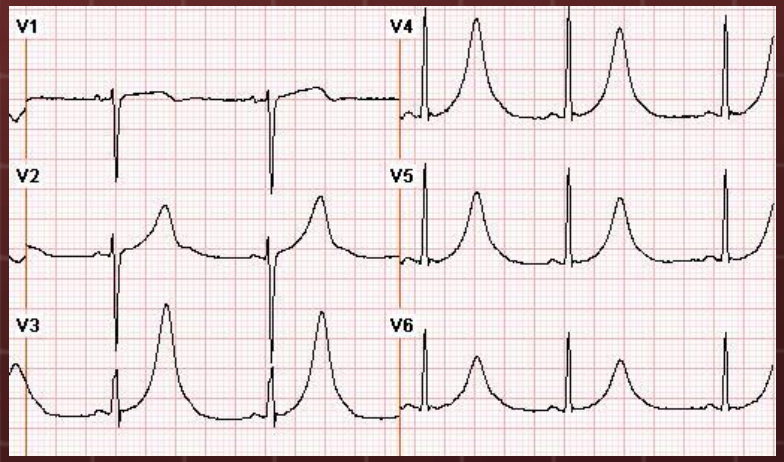


1. ST elevation in 2 contiguous leads (II,III,aVF) with reciprocal ST depression (V1-V3)
2. 1mm in inferior leads, 2mm in anterior leads

Importance of Repeat EKG's

- Repeat EKG every 5-10 min while CP ongoing
- Hyperacute T waves is an early and transient EKG finding in early STEMI





Diagnosis?

Signs

- Tachycardia > 100 beats per minute
- Tachypnea > 20 bpm
- Hypoxia < 95% on RA
- Lungs clear
- Extremities: equal pulses, +/- unilateral swelling or immobilized or recent injury

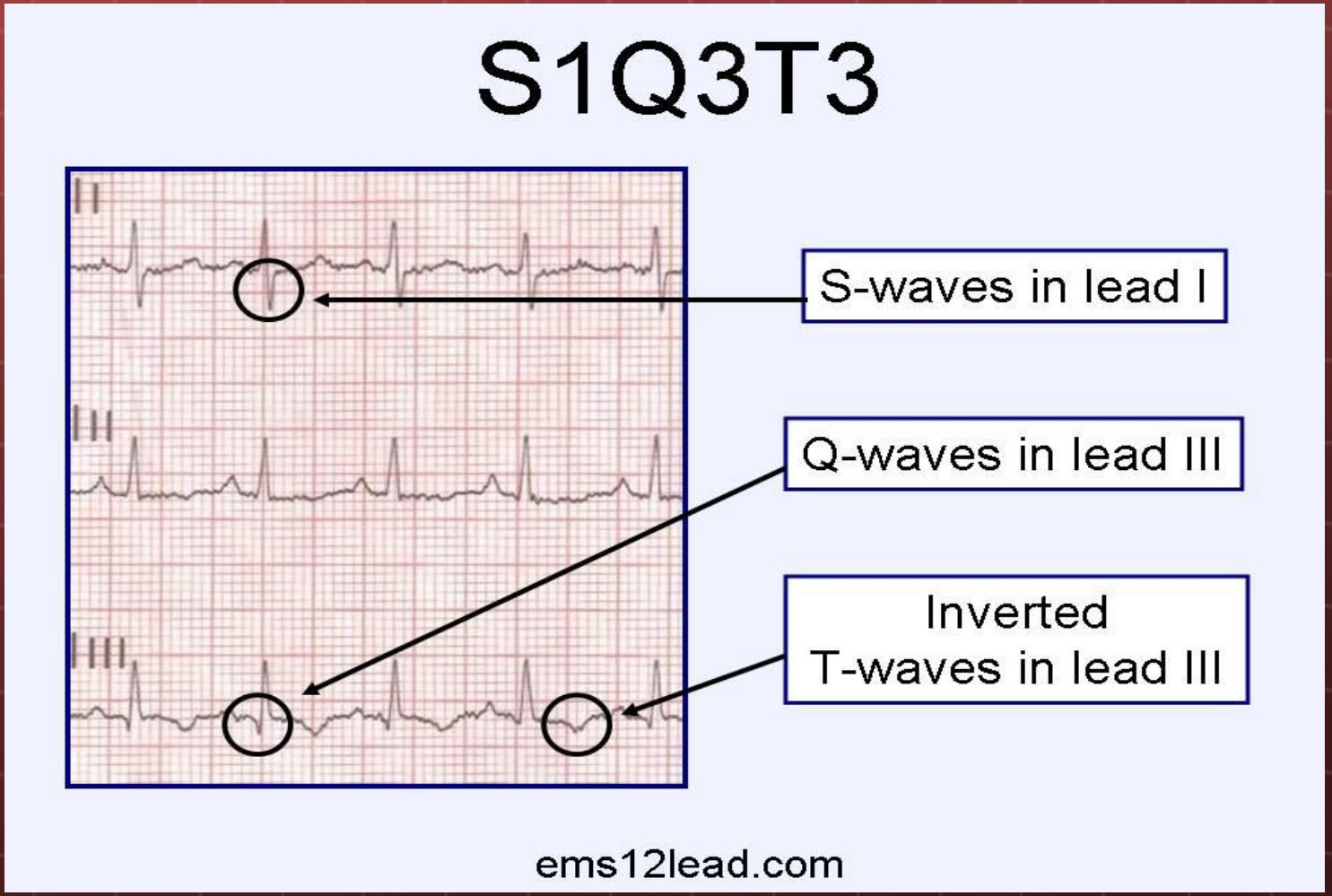
Symptoms

- SOB or dyspnea- Present in 90%
- Chest pain (pleuritic)- 66% of patients with PE
- Cough
- Sudden onset
- Gen Appearance: anxious

Pulmonary Embolus Risk Factors

- **Hypercoaguability**
  - Malignancy, pregnancy, estrogen use, factor V Leiden, protein C/S deficiency
- **Venous stasis**
  - Bedrest > 48 hours, recent hospitalization, long distance travel
- **Venous injury**
  - Recent trauma or surgery

PE EKG: Sinus Tachy most frequent finding; Classic S1,Q3,T3 seen in <20%



PE Diagnosis and Treatment

- D-dimer - Sensitive in low to mod probability (A neg d-dimer = >99% no PE); not sensitive enough for high probability; Lots of false positives (renal, CA, aortic dissection)
- CTA chest = Gold Standard if mod-high probability
- IV fluid to maintain BP
- Heparin (limits propagation, doesn't dissolve clot
  - Unfractionated or Fractionated (NOAC)
- Fibrinolytics (tPA) - if pt is unstable, RV strain

Diagnosis? (tough one)

- Signs – BP generally high, but VS variable
- Symptoms
  - Chest or back pain – ripping/tearing in 50%
  - Neurologic symptoms in 20%
  - Asymmetric pulses and BP readings L vs. R
  - Pre-syncope or Syncope

➢ *CP +/- BP *AND* Neuro symptoms = aortic dissection until proven otherwise

Aortic Dissection Risk Factors

- Bimodal distribution
  - Young: Connective tissue (Marfan) or pregnancy
  - Older: Most commonly > 50 (mean age 63)
- Risk factors
  - Male: 66% of patients
  - Hypertension: 72% of patients
  - Connective tissue dis-30% of Marfan's
  - Cocaine Use
  - Syphilis

Aortic Dissection Diagnosis and Treatment

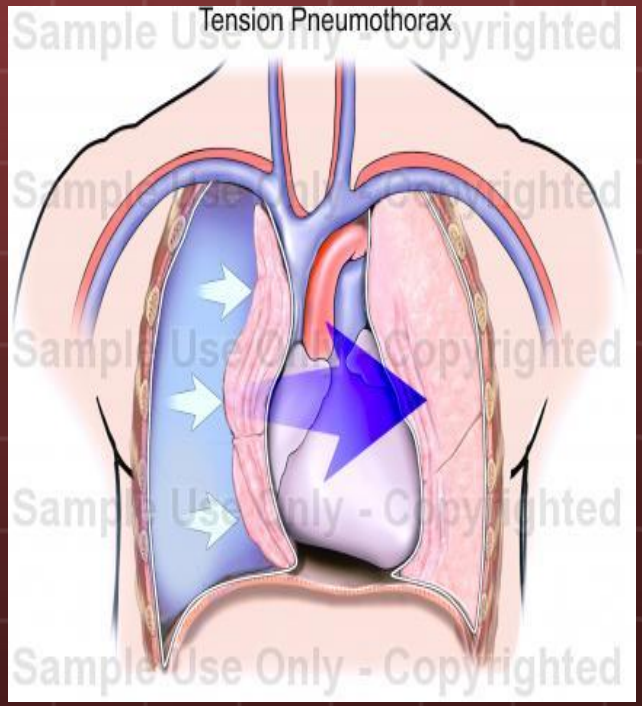
- CXR- Widened mediastinum (not sensitive)
- CTangio chest- Very sensitive and specific or TEE
- *Bedside US* – evaluate aorta and look at heart to r/o tamponade
- CT surgery early
- Blood pressure control
  - Goal SBP 120-130 mmHg
  - Beta blockers are first line (Labetalol and Esmolol)
  - Then can add vasodilators i.e. nitroprusside

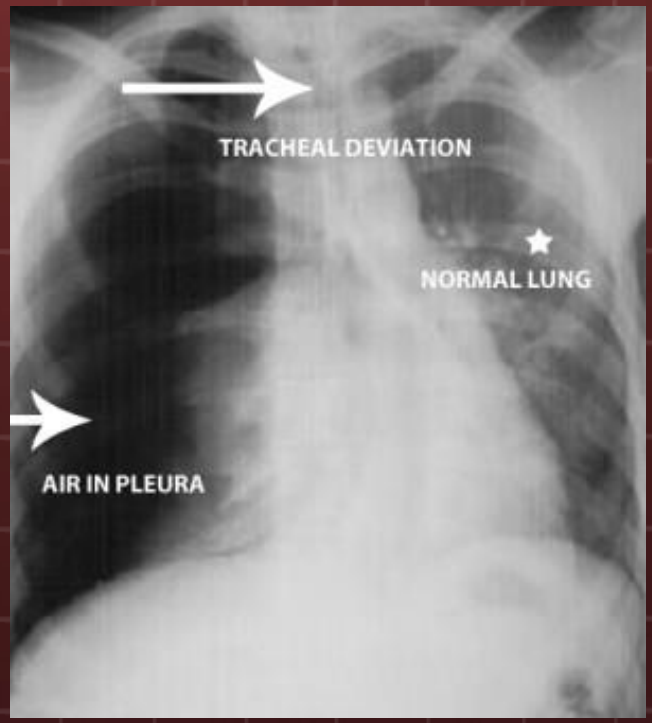
Diagnosis?

- Signs –VS variable; if severe: tachycardic, hypotensive and hypoxic, distended neck veins, tracheal deviation
- Symptoms
  - Pleuritic chest pain - sharp
  - Decreased breath sounds on one side

Tension Pneumothorax RF, Diagnosis

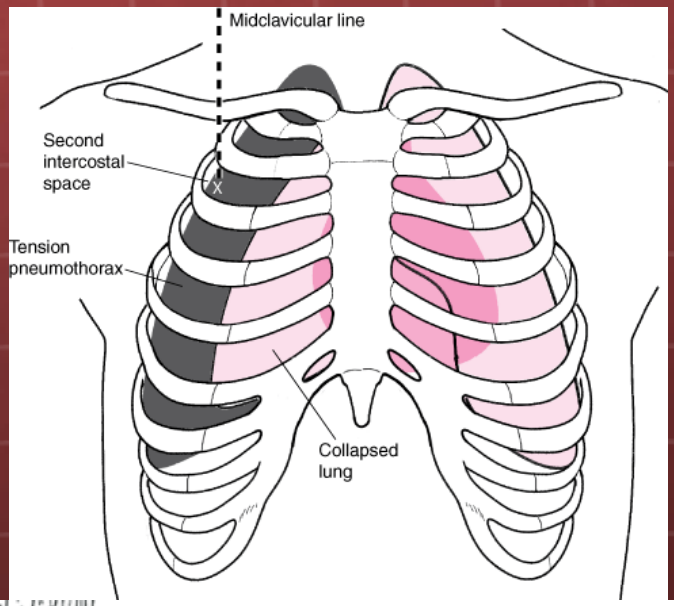
- Trauma (rib fx), iatrogenic (s/p central line placement, thoracentesis), positive P ventilation (vent, BiPap), COPD, connective tissue dis

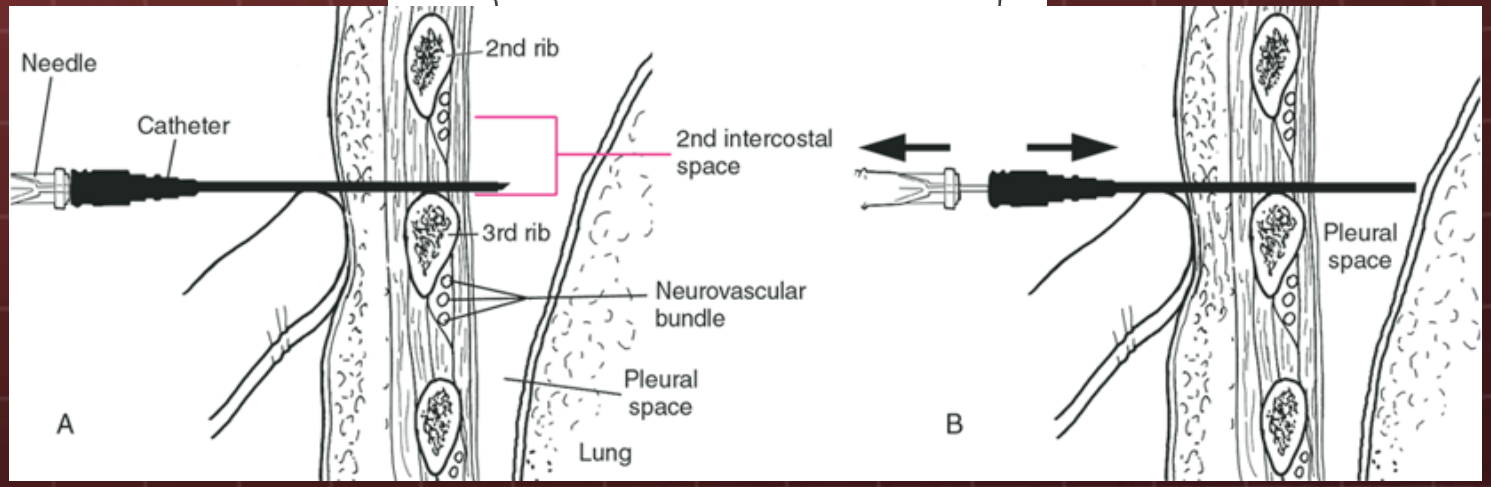




Tension Pneumo Treatment

- Needle decompression, Chest Tube





Diagnosis?

Signs

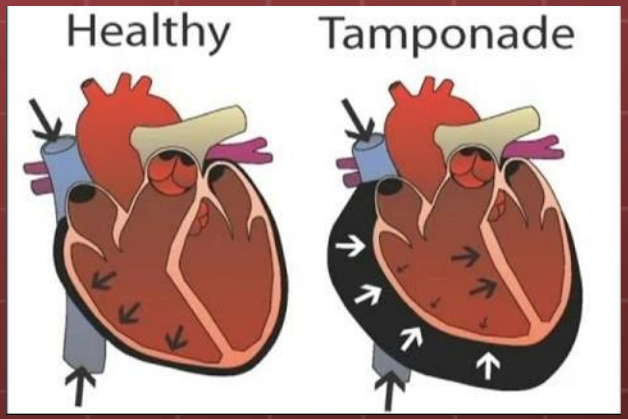
- Tachycardia, hypotension (if severe)
- Muffled heart sounds
- Lungs clear

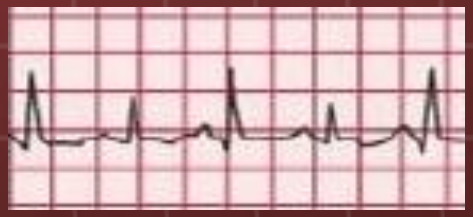
Symptoms

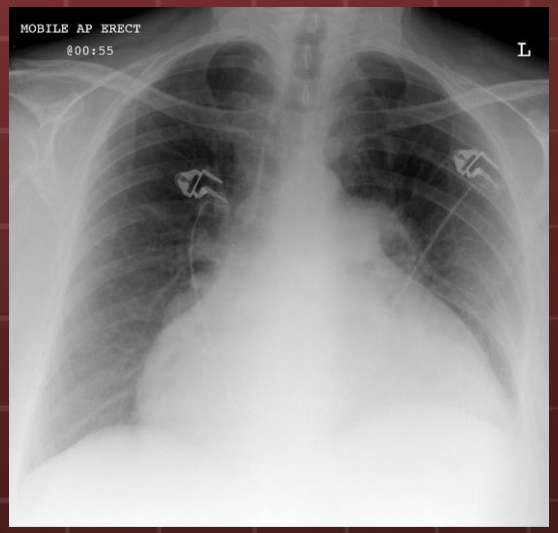
- SOB or dyspnea
- Chest pain (positional)
- General appearance = Anxious

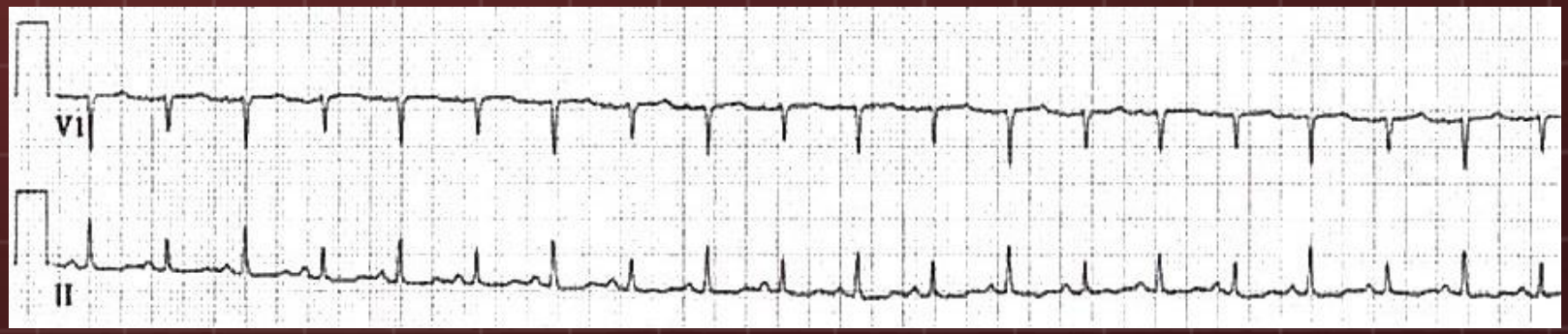
Cardiac Tamponade - Diagnosis

- Pericardial friction rub; Kussmaul sign=↑JVD w/inspiration
- CXR - large cardiac sillouette; EKG – tachycardia first, then ↓QRS amplitude (low voltage), then electrical alternans

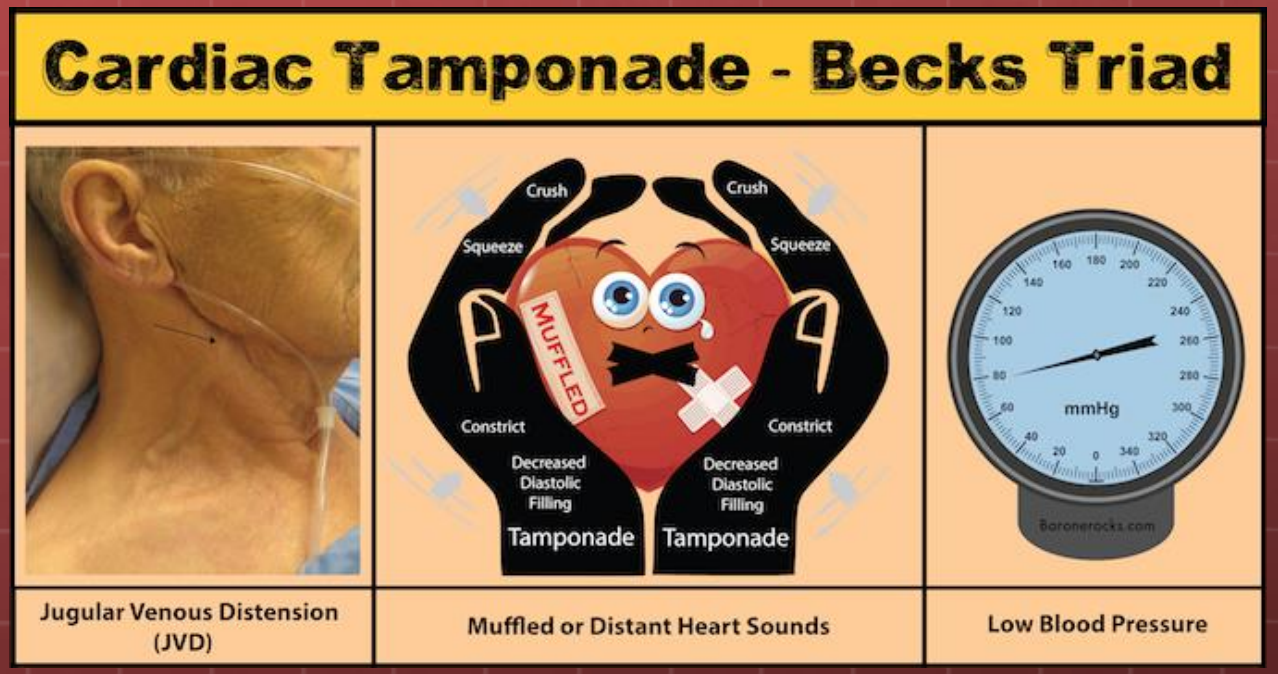


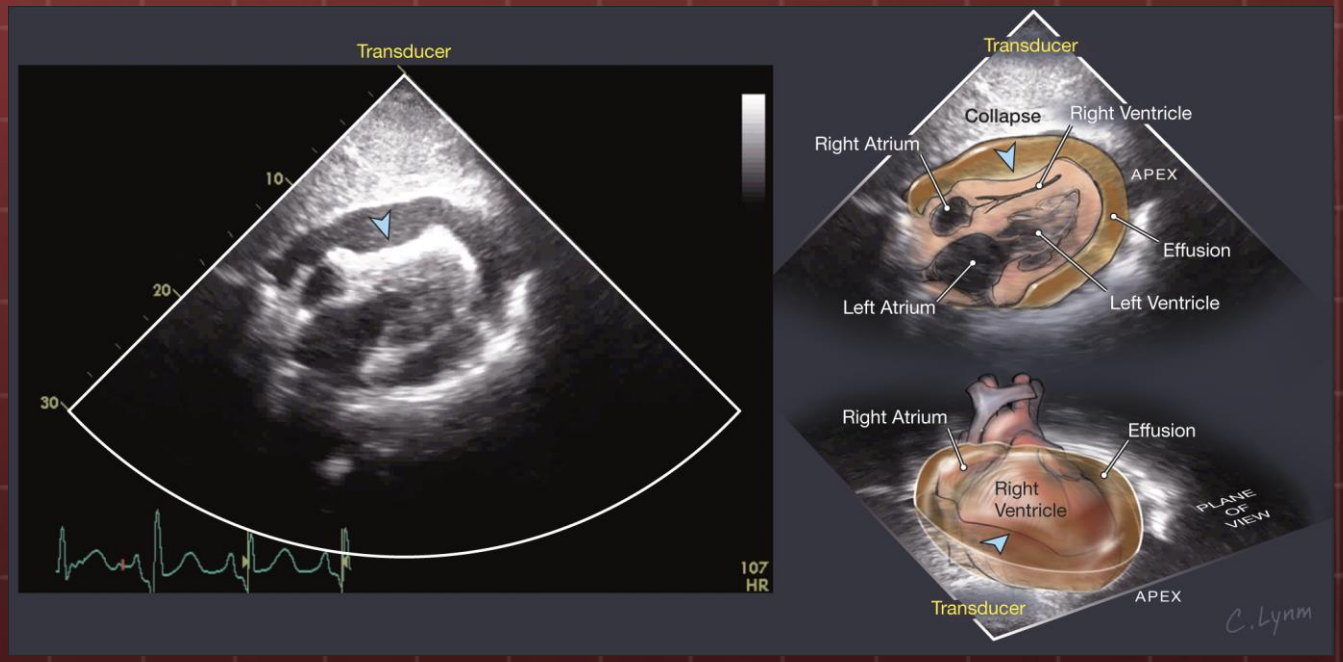






Beck's Triad Seen in Acute Tamponade



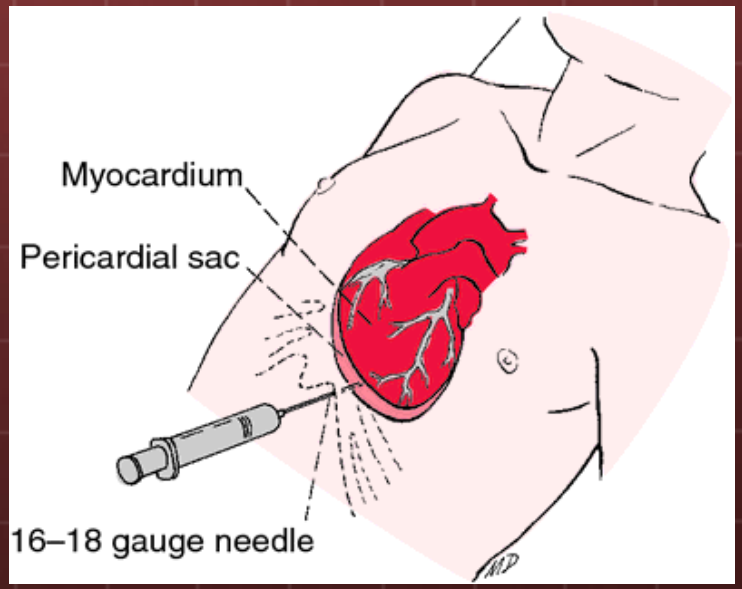


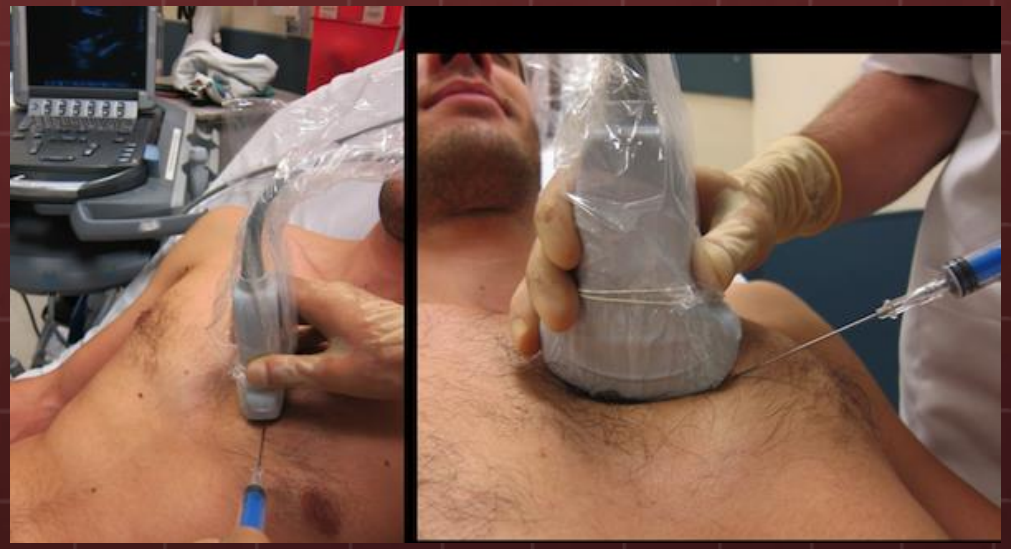
Risk Factors/Etiology

- Malignancy, s/p radiation therapy
- Renal failure (uremia)
- Pericarditis
- Lupus
- s/p AMI or cardiac cath or CV surgery
- Trauma (usually acute)
- Infections – HIV, TB

Cardiac Tamponade Treatment

- O2, IVF to increase preload, elevate legs to increase venous return; no NIPPV (Bipap)
- STAT bedside echo, pericardiocentesis (bedside if in shock); Cardiology/Cardiothoracic Sx for pericardial window





Diagnosis?

Signs

- Tachycardia, tachypnea, fever (variable)
- Lungs clear
- Extremities: equal pulses

Symptoms

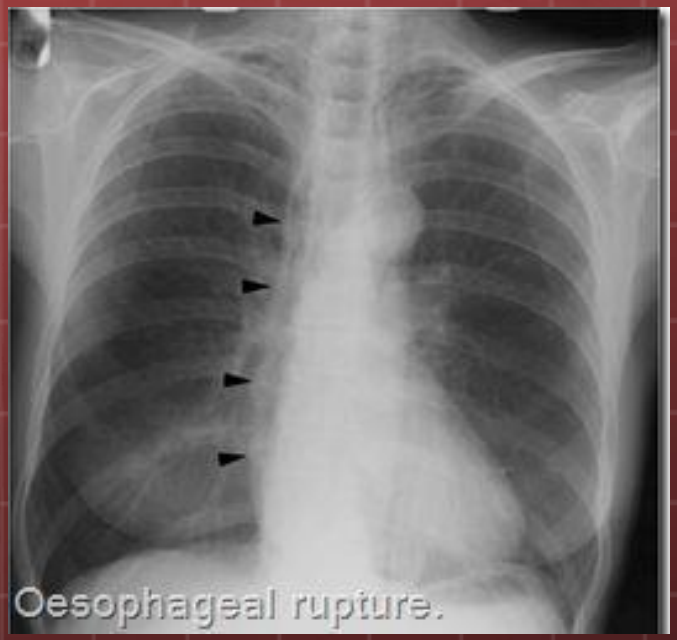
- Dyspnea, dysphagia
- Chest pain (pleuritic)-lower chest, epigastric
- Radiation to back (sometimes)
- Sudden onset if after protracted vomiting; Gradual onset if after EGD

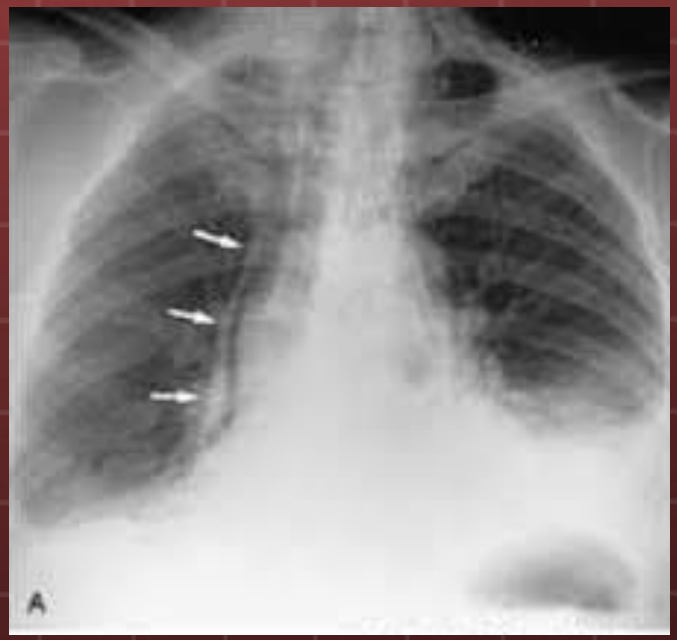
Esophageal Rupture, RF

- Aka Boerhaave Syndrome
- Mackler Triad (50%): middle-aged man h/o dietary overindulgence and overconsumption of alcohol + CP/subQ emphysema after recent vomiting/retching
- Tear in the esophagus leads to leaking of GI contents into the mediastinum
- Inflammation followed by infection cause rapid deterioration, sepsis and death
- Risk Factors: Iatrogenic (EGD esp w/dilation), severe retching, trauma, foreign bodies, toxic ingestion

Esophageal Rupture Diagnosis & Treatment

CXR: SubQ and/or mediastinal air





- NPO, antibiotics, supportive care, Surgical consult
- Small tears managed conservatively

Deadly causes of Chest Pain

- Acute Coronary Syndromes
- Pulmonary Embolism
- Aortic Dissection
- Pneumothorax
- Cardiac Tamponade
- Esophageal Rupture