

CC: CP, SOB, cough

HPI: 51-year-old woman.

- 1 month ago, started having frequent cough productive of yellow sputum
- Assoc with SOB & generalized fatigue
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- Denied fevers, chills, unintentional weight loss.
- Denied hx of TB or exposure to TB.

PMH:

- T2DM
- HTN

SH:

- EtOH/Tobacco / Drugs: denied
- Originally from Mexico

OUTPATIENT MEDS:

- Albuterol PRN
- Pepcid daily

PHYSICAL EXAM:

Tmax: 37C, **BP:** 131/71, **HR:** 98, **RR:** 18, **SpO2:** 98% on RA

General: NAD

HEENT: EOMI, MMM, sclera anicteric, supple neck, no JVD, no LAD

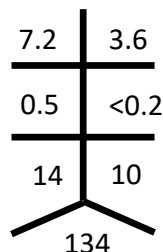
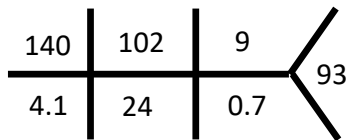
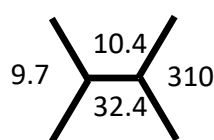
CV: Tachycardic, regular rhythm, no murmurs/rubs/gallops

Pulm: CTAB

GI: Nondistended, soft, nontender to palpation, BS intact

Neuro: AOx3, moving all extremities against grav spon

LABS:



Troponin: 9 → 9

Procal: <0.1

TSH: 2.84

NT Pro-BNP: 444

INR: 1.3

Lipase: 28

CXR

Enlarged cardiomeastinal silhouette with somewhat globular configuration.

CT Chest WO Con

Large pericardial effusion measuring slightly higher density than simple fluid and questionable mild pericardial enhancement with pericarditis not excluded. Straightening of the interventricular septum raises the possibility of tamponade physiology.

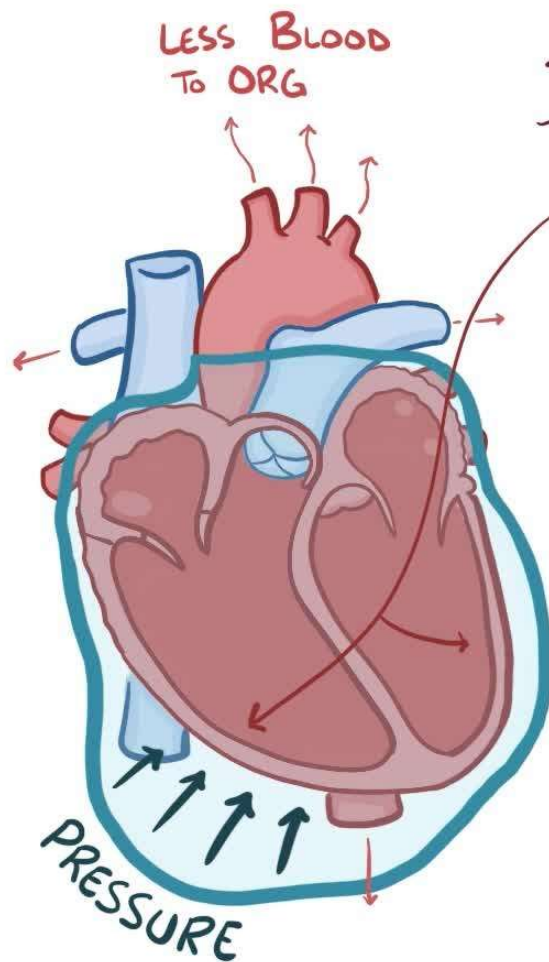
TTE

Large pericardial effusion c/w tamponade

PROBLEM REPRESENTATION:

Middle aged woman from Mexico with subacute-chronic SOB, fatigue, pleuritic CP, and productive cough found to have...

TAMPONADE



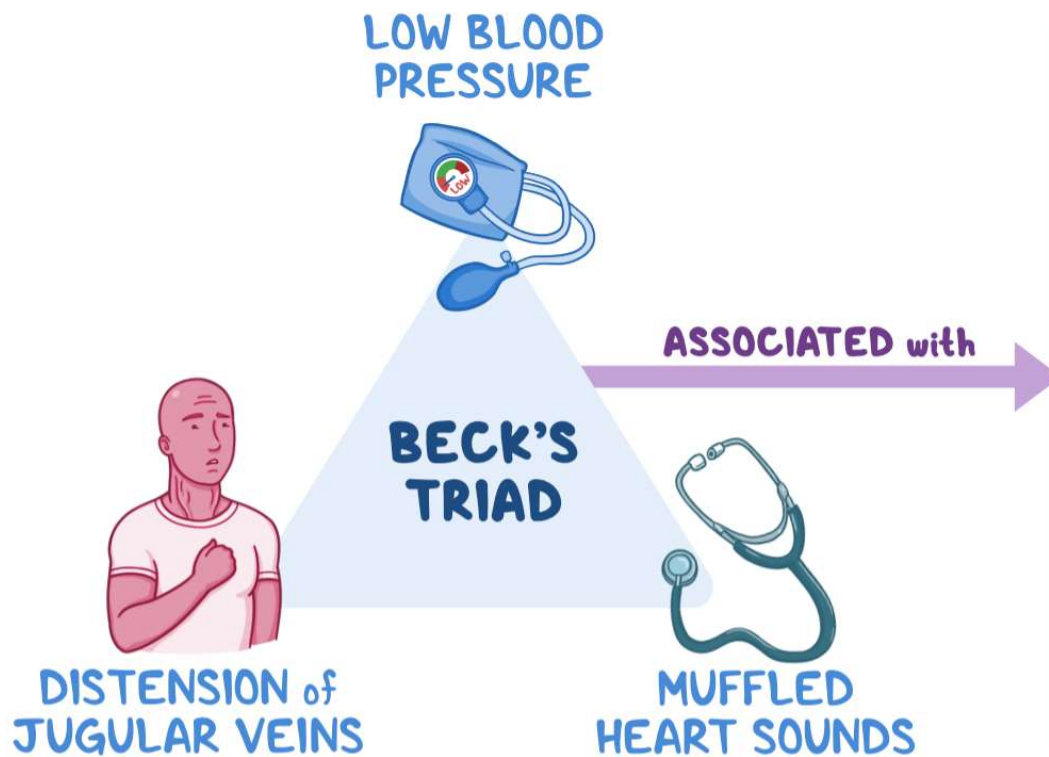
TAMPONADE

HEART DOES NOT STRETCH OUT FULLY
BETWEEN CONTRACTIONS

↳ CHAMBERS DON'T FILL PROPERLY

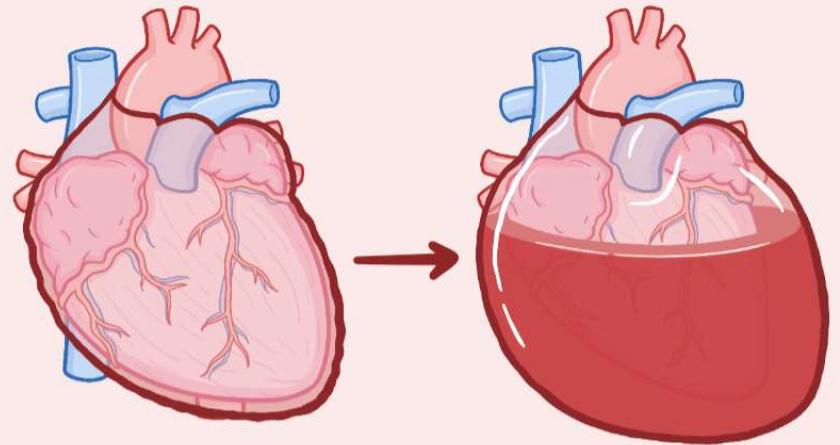
↳ LESS CARDIAL OUTPUT

↳ HYPOTENSION



ACUTE CARDIAL TAMPONADE

⚠ MEDICAL EMERGENCY ⚠



BUILD-UP of FLUID, BLOOD, or AIR in the PERICARDIAL SAC
↳ COMPRESSES the HEART

- * NOT EVERYONE with CARDIAC TAMPONADE will show ALL 3 SIGNS of BECK'S TRIAD
- * OTHER SIGNS might appear in CARDIAC TAMPONADE, like TACHYCARDIA and SHORTNESS of BREATH

Normal

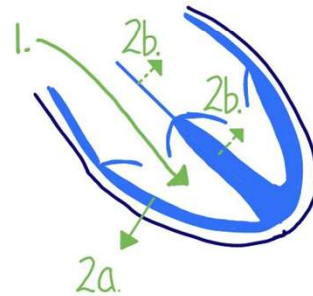
1. Inspiration → Neg. Intra-Thoracic Pressure
→ ↑ Venous Return

2. ↑ Venous Return → ↑ R. Heart Filling

a. RV Free Wall Accommodates Most ↑ Filling

b. Slight Bulge Of Atrial-Ventricular Septum
Leads To Small ↓ LV Filling

3. Small ↓ LV Filling → Normal ↓ In BP
w/ Inspiration



Pulsus Exaggeratus

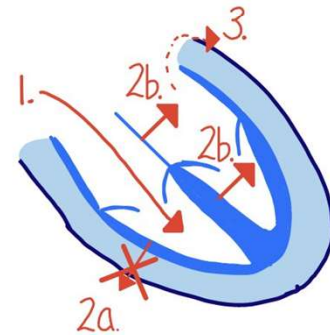
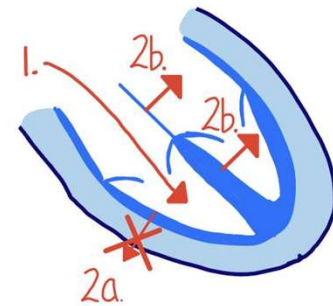
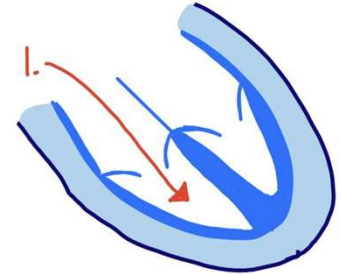
1. Inspiration → Neg. Intra-Thoracic Pressure
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a. RV Free Wall Cannot Accommodate Most
↑ Venous Return B/C Of ↑ Pericardial Pressure

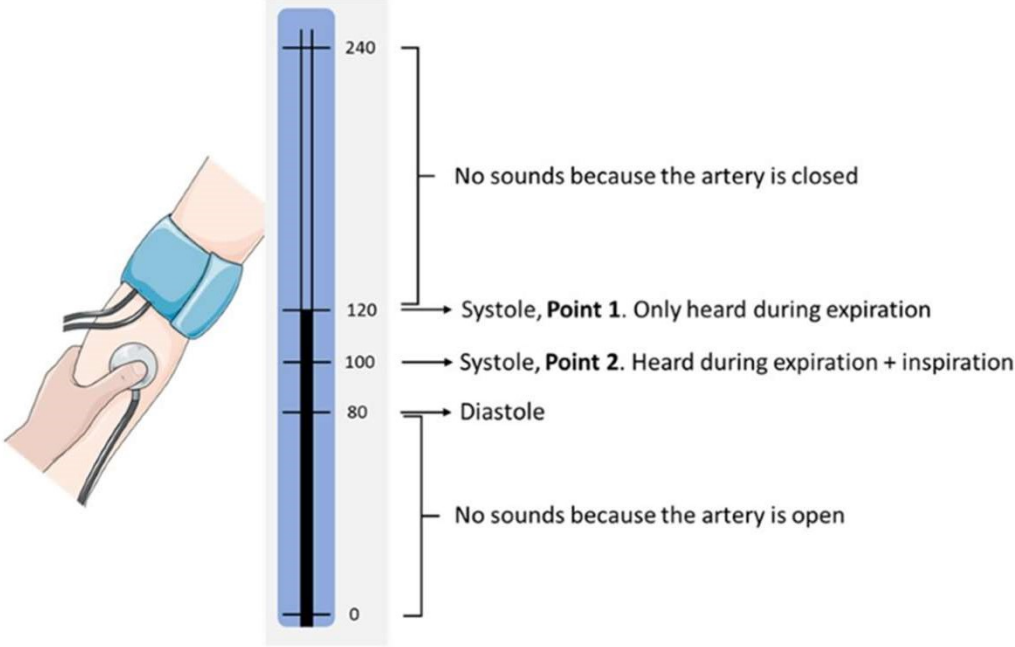
b. Significant Bulge Of Atrial-Ventricular Septum
Leads To Large ↓ LV Filling

3. Large ↓ LV Filling → Exaggerated ↓ In BP (≥ 10 mm Hg)
w/ Inspiration = Pulsus Exaggeratus



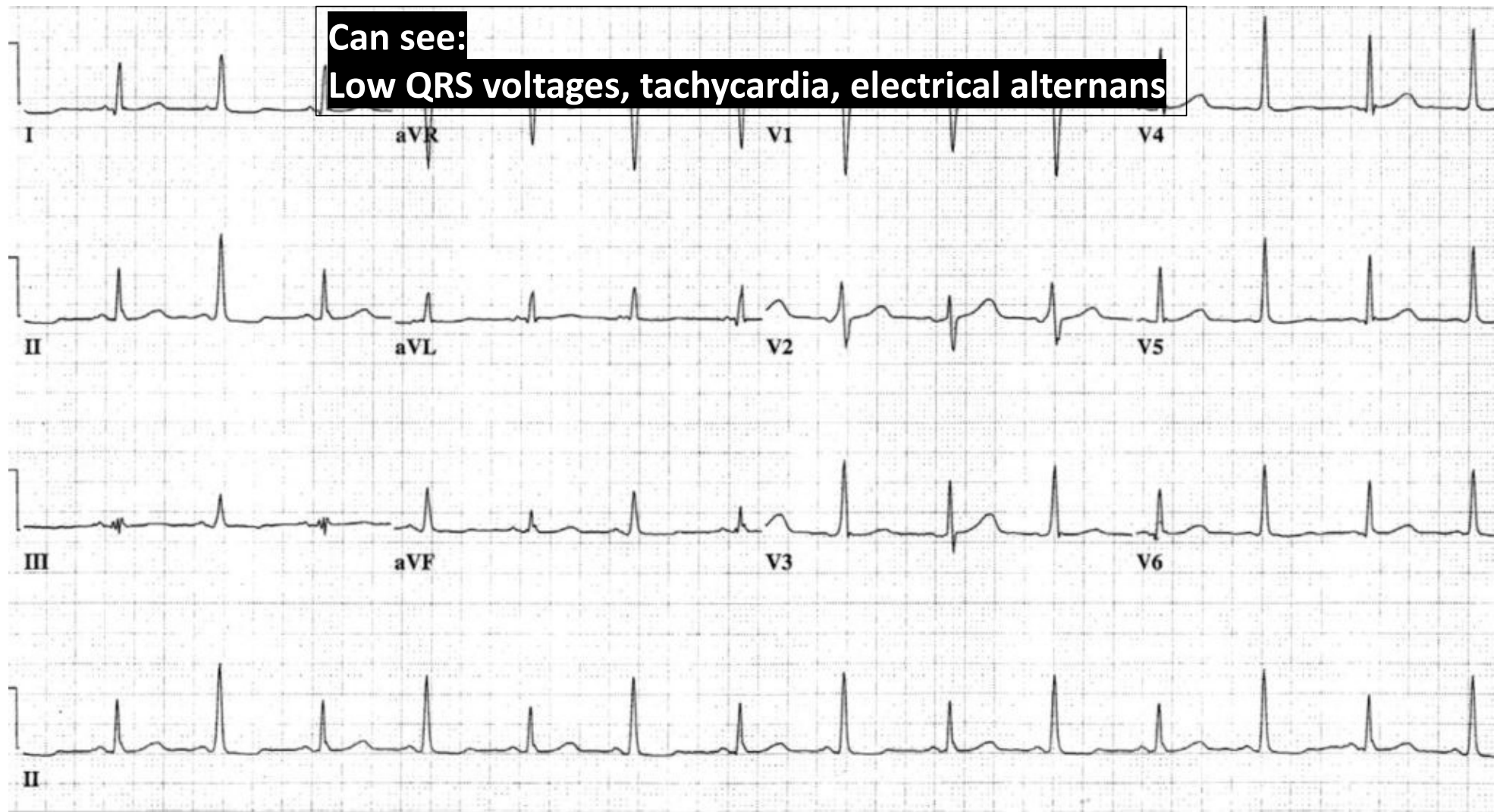
How to measure the pulsus paradoxus

- Step 1: Take a normal manual blood pressure to determine the patient's SBP and remind yourself what their Kortotkoff sounds are like
- Step 2: Inflate the BP cuff to higher than their normal SBP
- Step 3: Lower the cuff very slowly until you only intermittently hear the Kortotkoff sounds; I often will let the air naturally deflate out of the cuff to get this number. Record the number at this point as **Point 1**.
- Step 4: Continue lowering the cuff until you hear the Kortotkoff sounds coming through at all times (both inspiration and expiration). Record this as **Point 2**.
- Step 5: The difference in mmHg between Point 1 and Point 2 is your pulsus paradoxus value. Typically a value <10mmHg is considered normal (not hemodynamically significant)

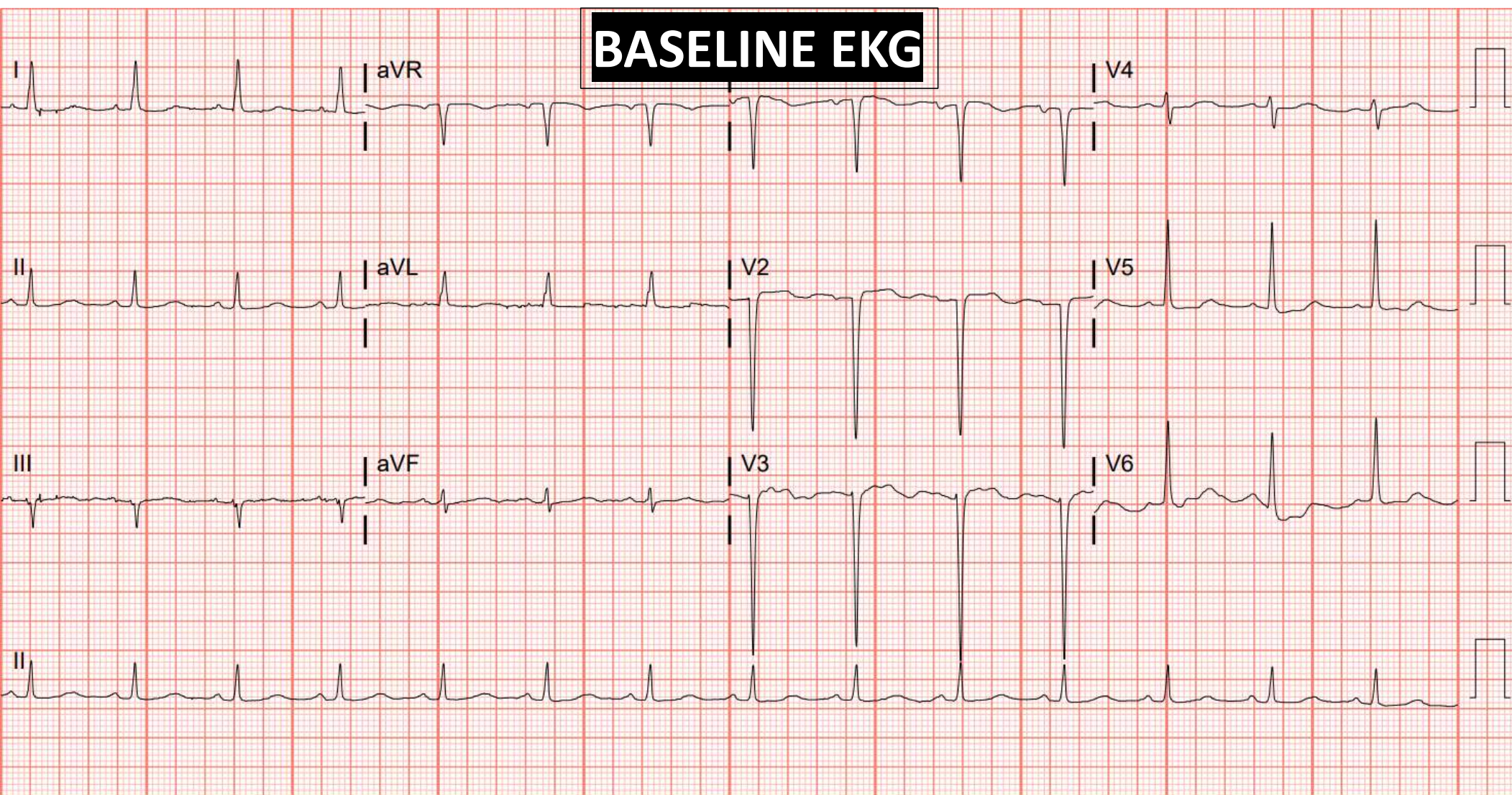


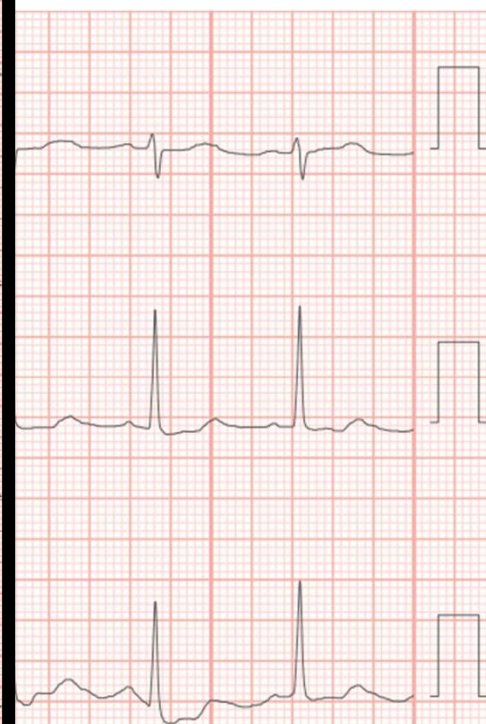
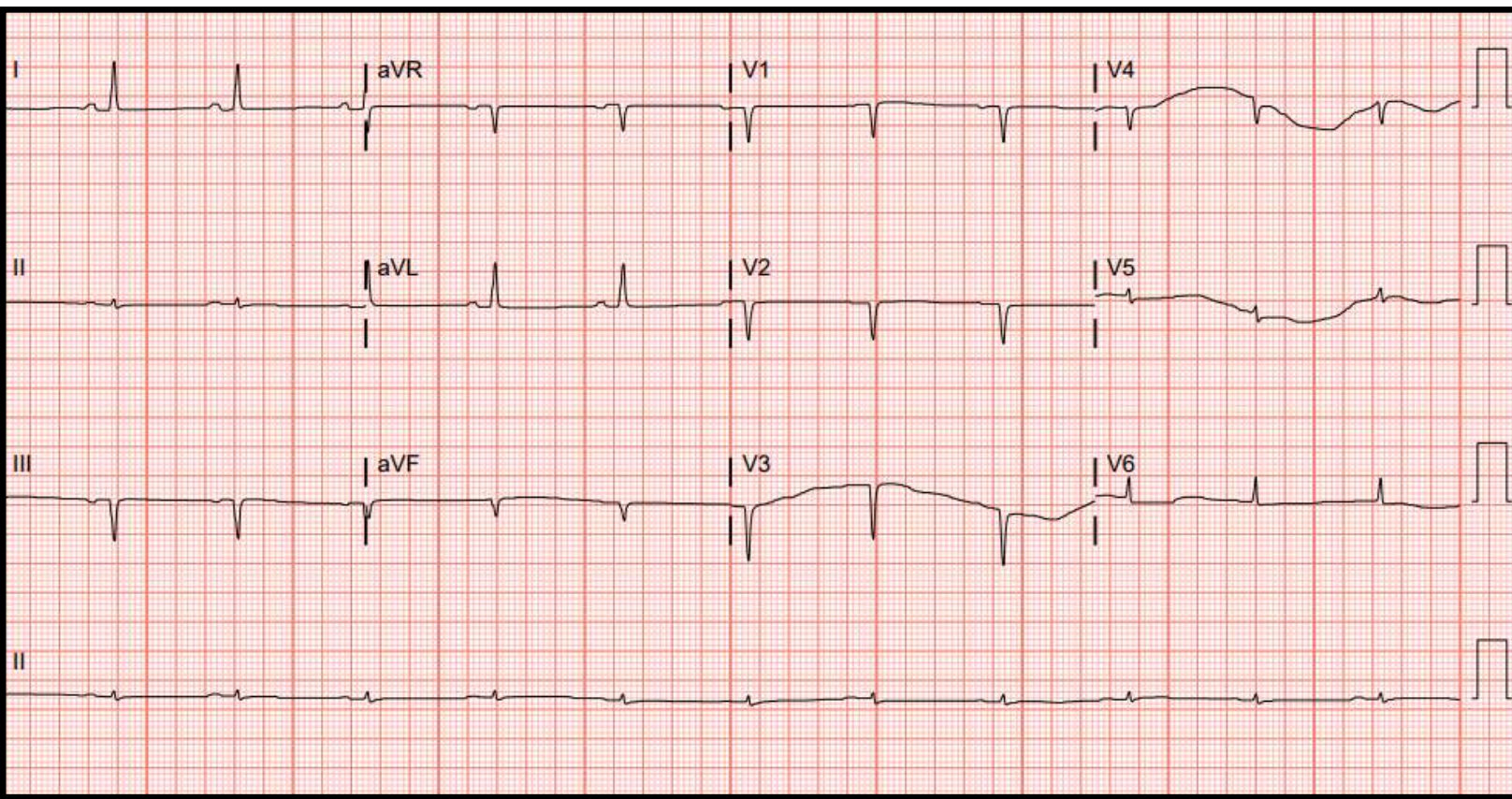
Can see:

Low QRS voltages, tachycardia, electrical alternans



BASELINE EKG

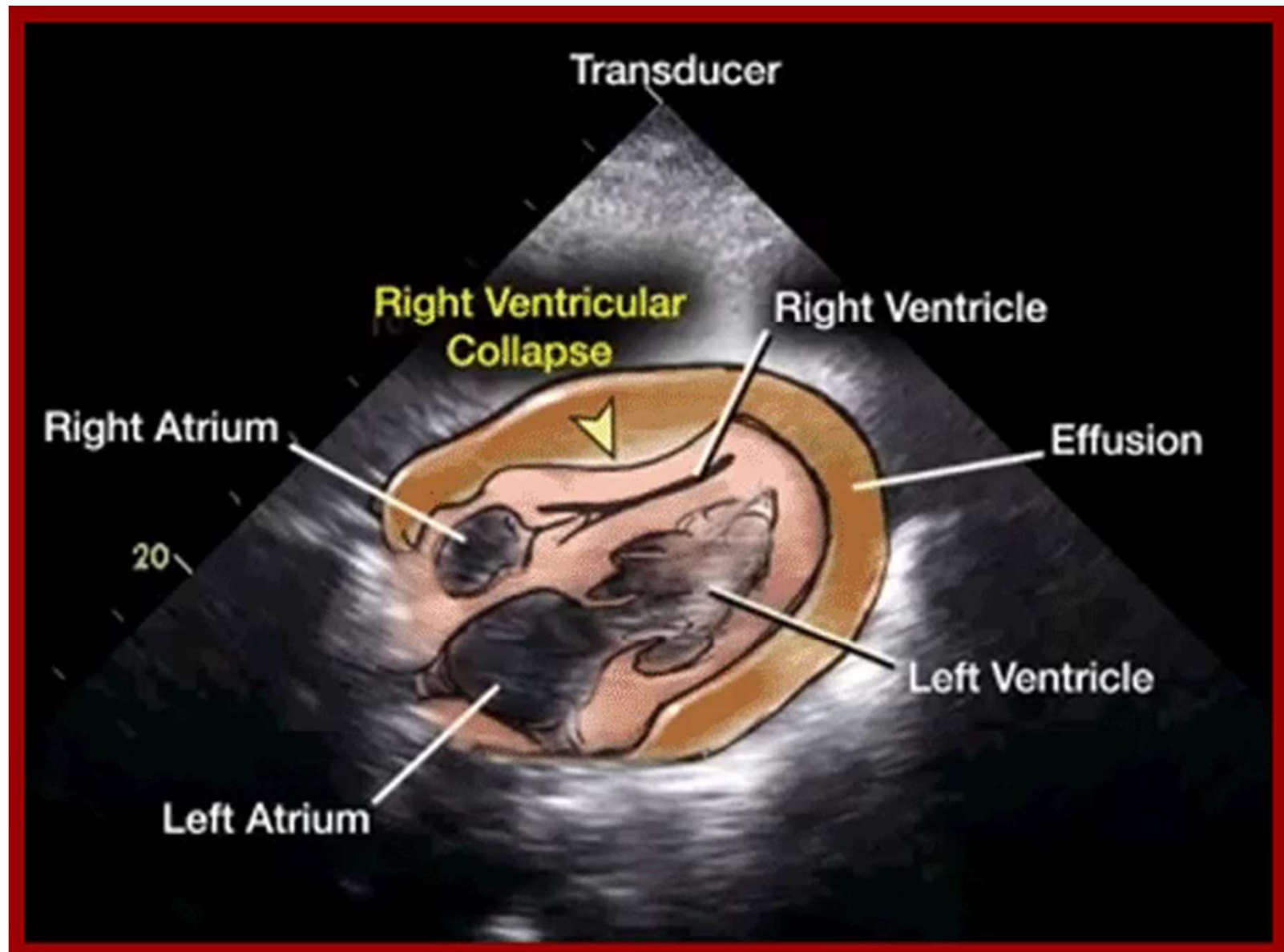






TTE / POCUS

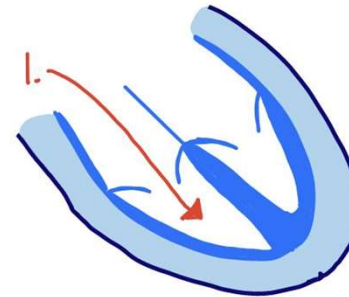
- Chamber collapse
- IVC plethora
- Reciprocal respiratory variations in ventricular volumes



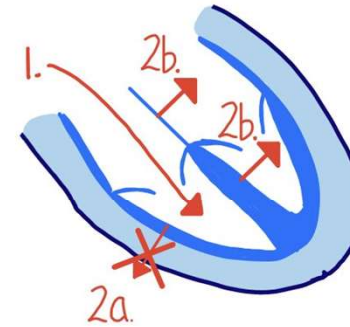


Pulsus Exaggeratus ~~Pulsus Paradoxus~~

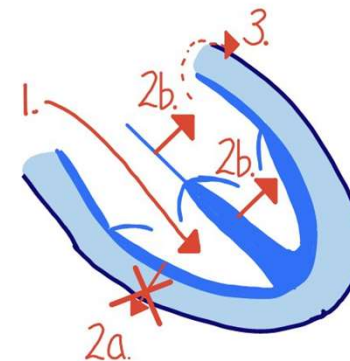
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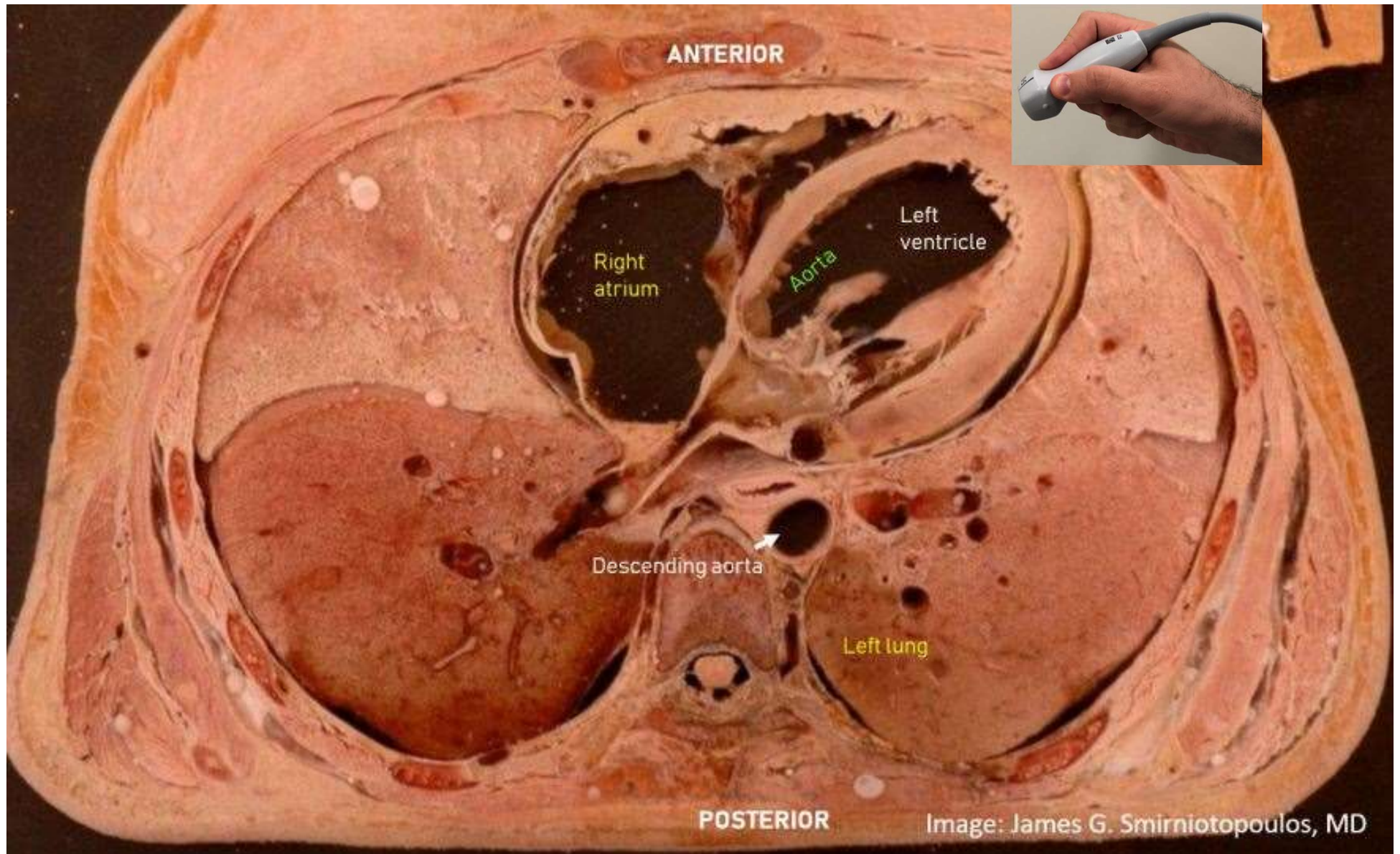


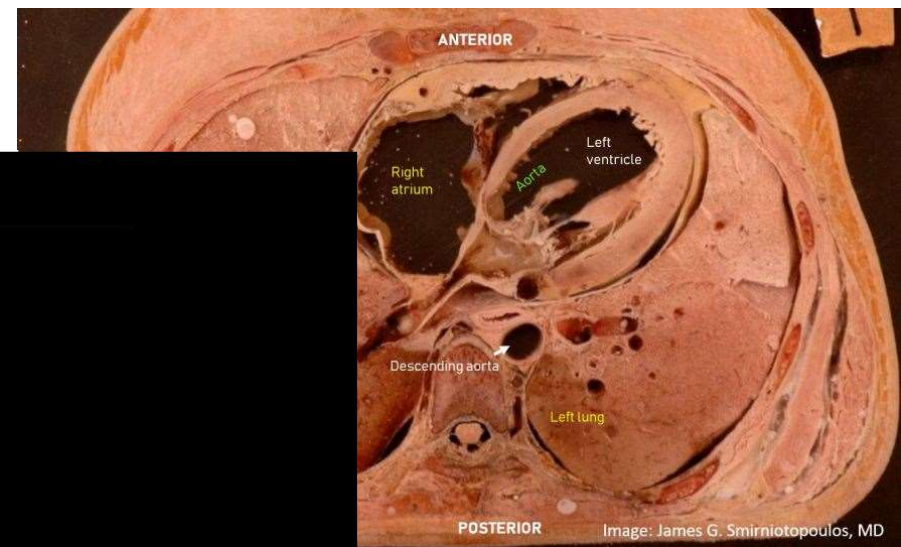
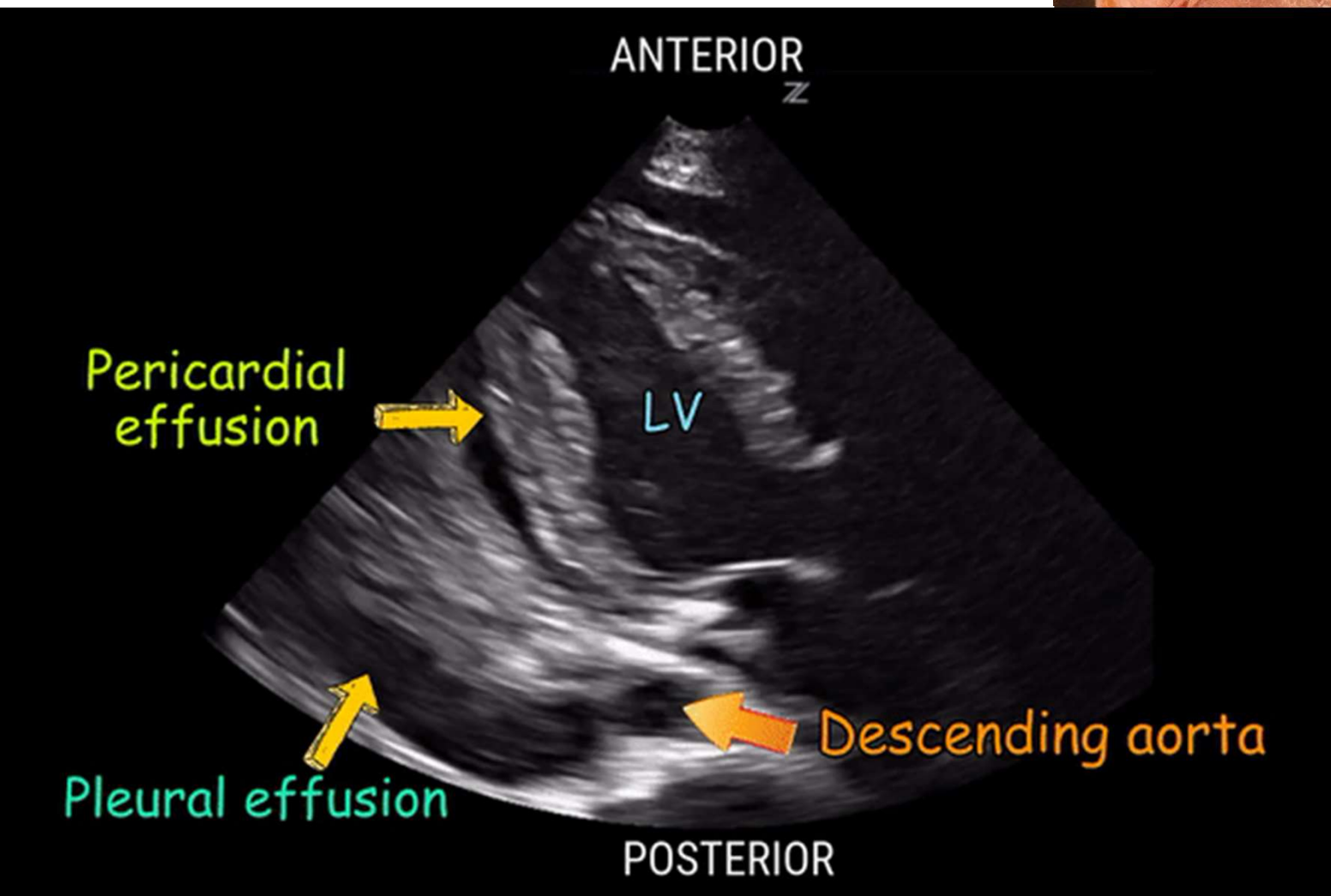
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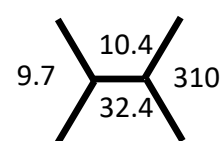
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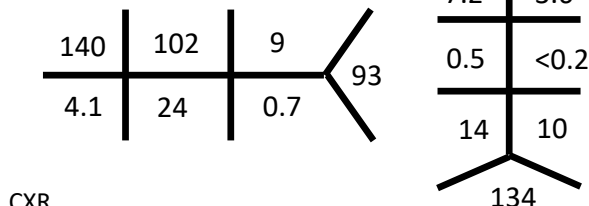
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DIAGNOSIS: **LARGE PERICARDIAL EFFUSION C/F TAMPONADE****LEARNING POINTS:**

- Reviewed etiologies of pericardial effusions
- Cardiac tamponade
 - Exam
 - Beck's triad
 - Pulsus paradoxus
 - EKG
 - Low voltage QRS, tachycardia, electrical alternans
 - TTE / POCUS
 - Cardiac chamber collapse
 - Dilated IVC
 - Reciprocal respiratory variations in ventricular volumes
- Pericardial vs pleural effusion on POCUS PLAX
 - Pericardial: fluid anterior to descending aorta
 - Pleural: fluid posterior to descending aorta