

UT Southwestern
Medical Center

Visualizing Vital Signs:

Harnessing Cardiac POCUS

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Department of Emergency Medicine

Disclosures: None

Objectives

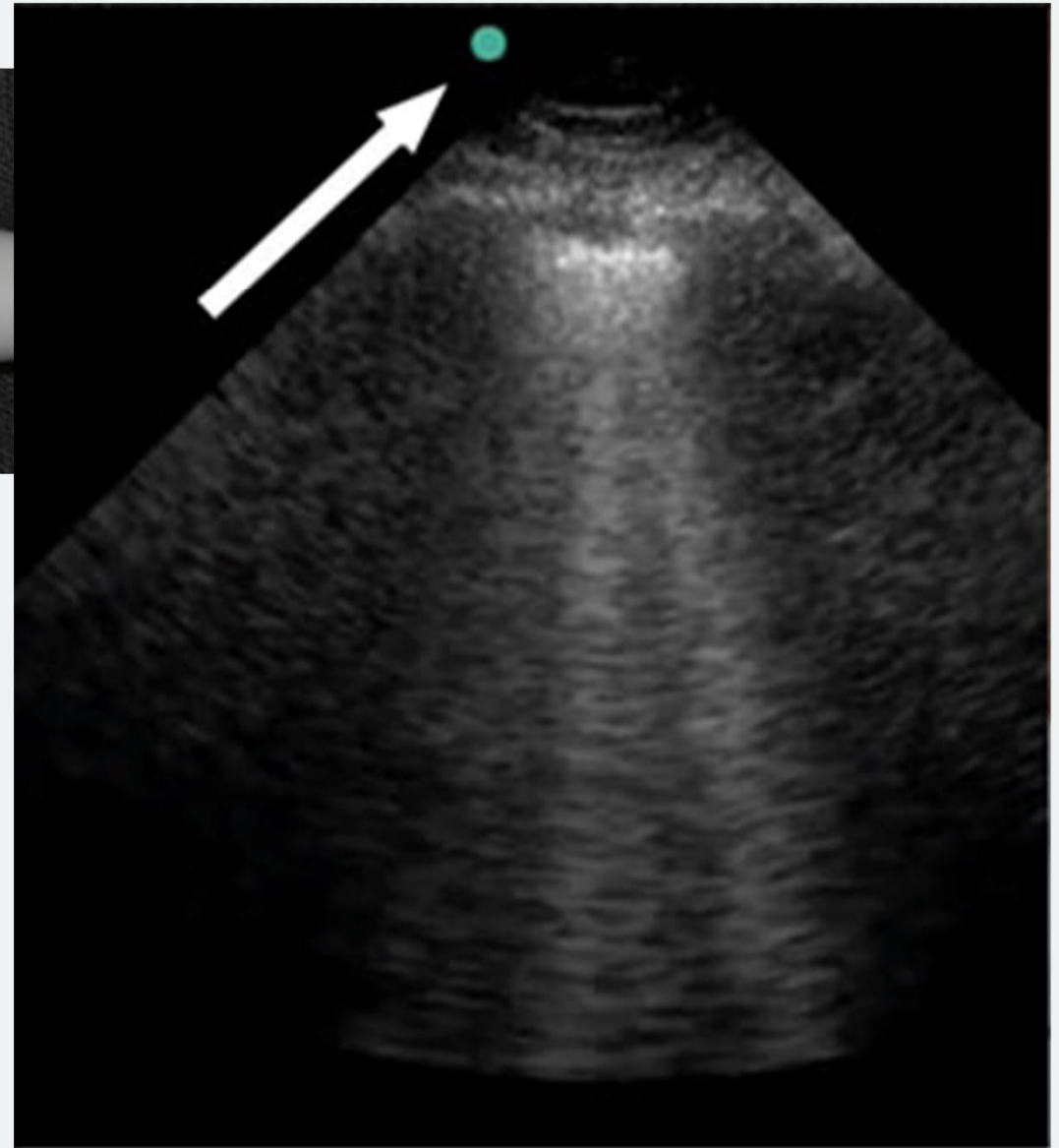
- Obtain and identify main focused POCUS cardiac views
 - Advantages of each view
- The S's of Focused Echo
- Clinical Scenarios





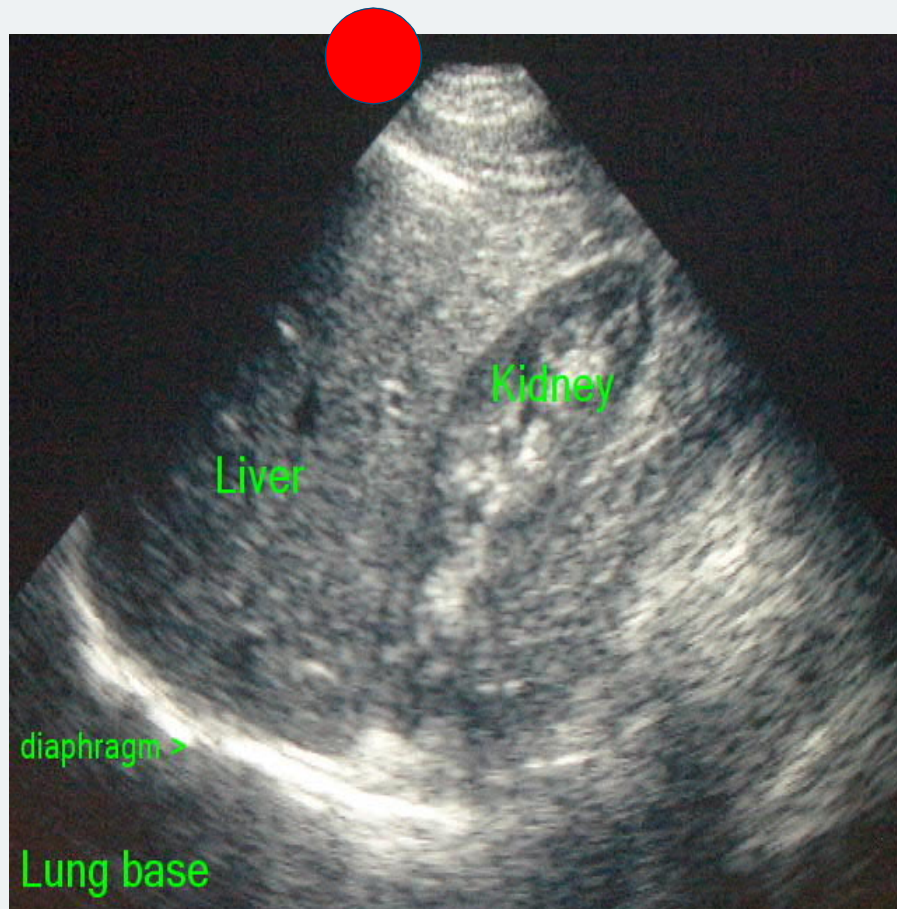
Don't forget

Probe marker corresponds to
screen marker

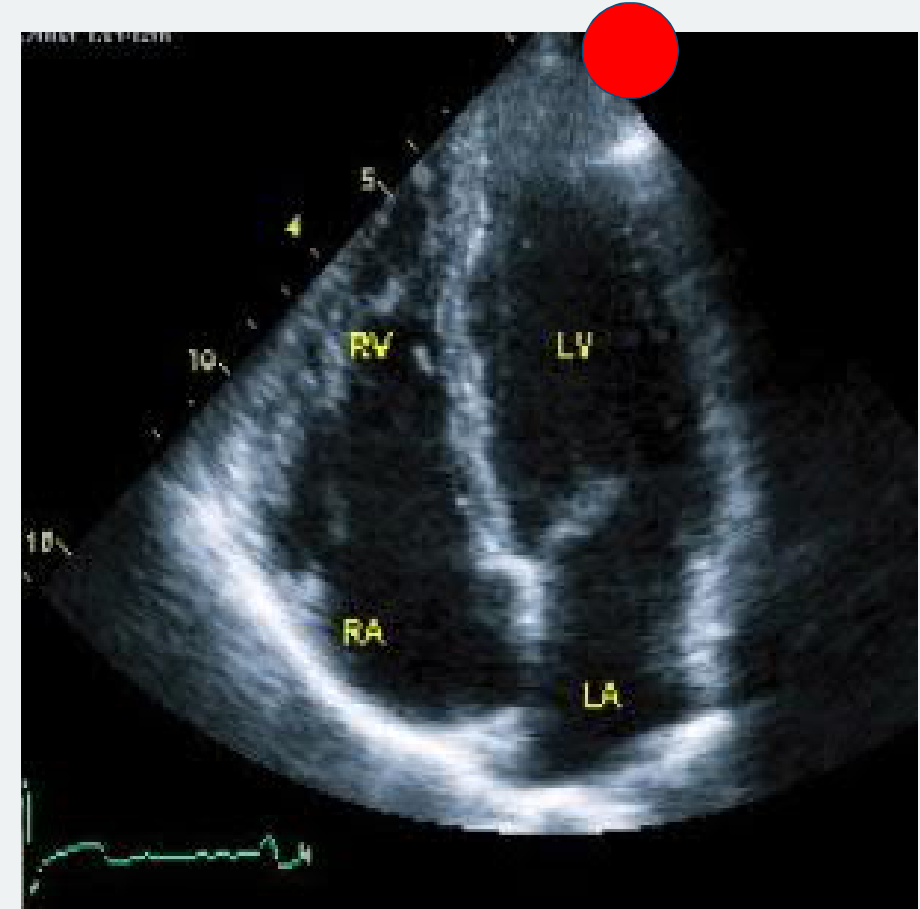


The Screen Marker

E-FAST



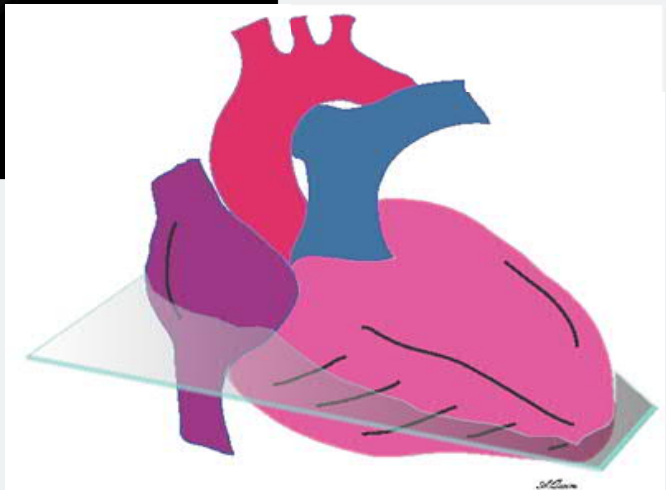
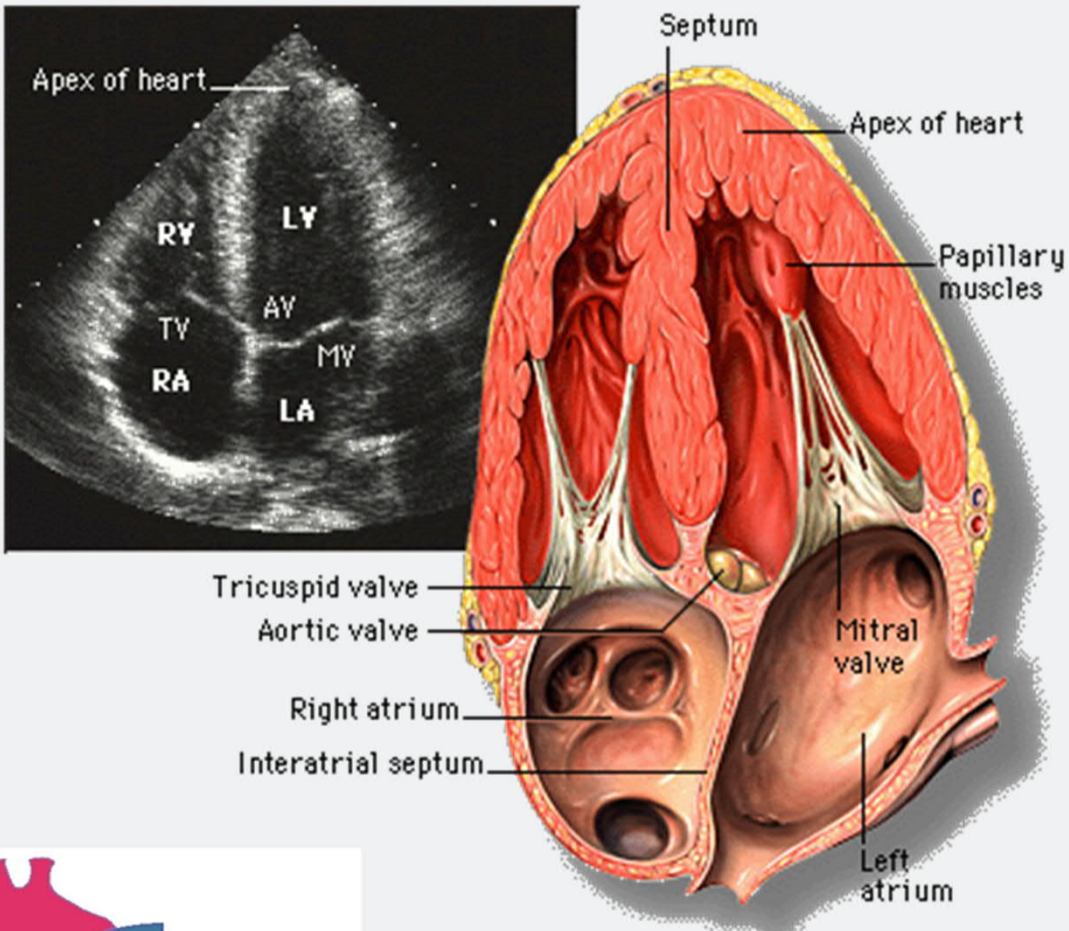
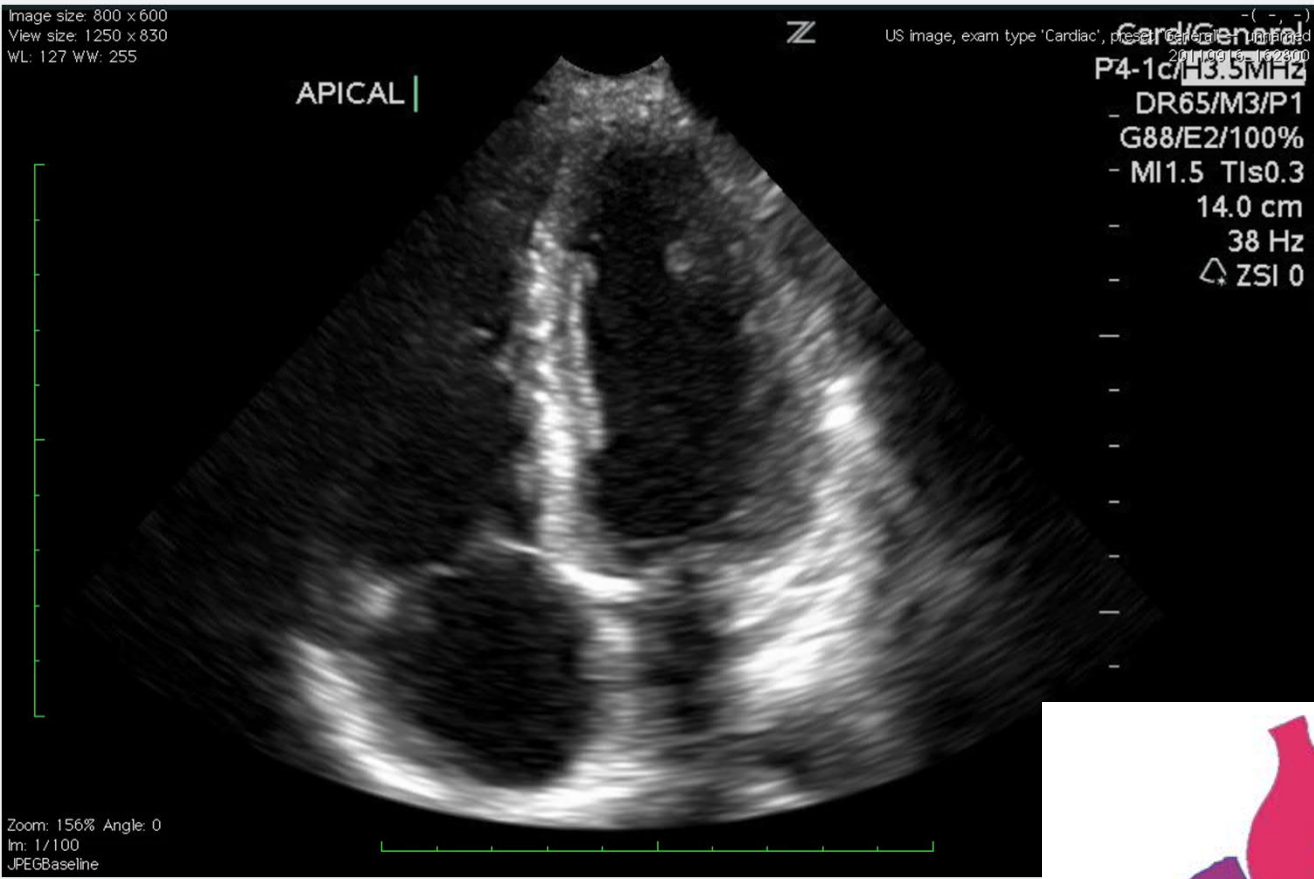
Echo



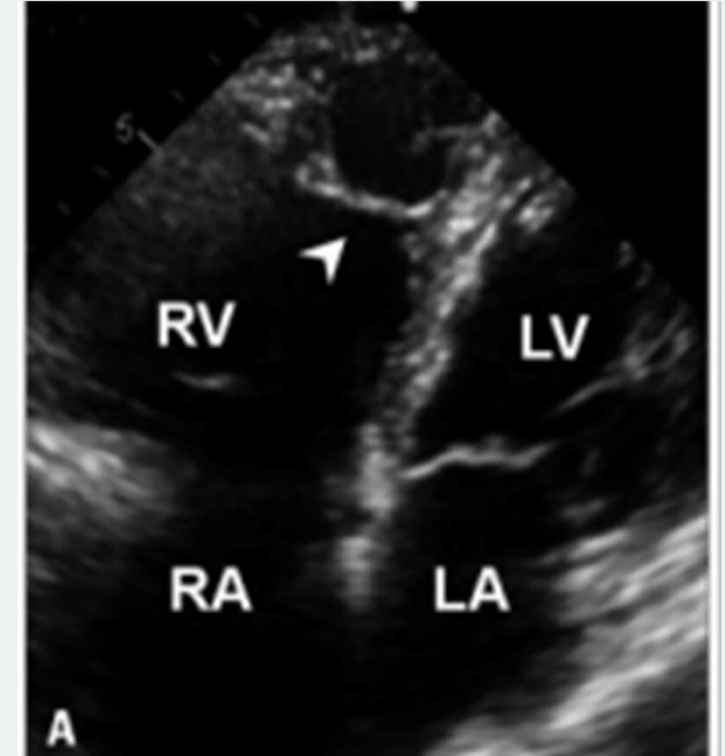
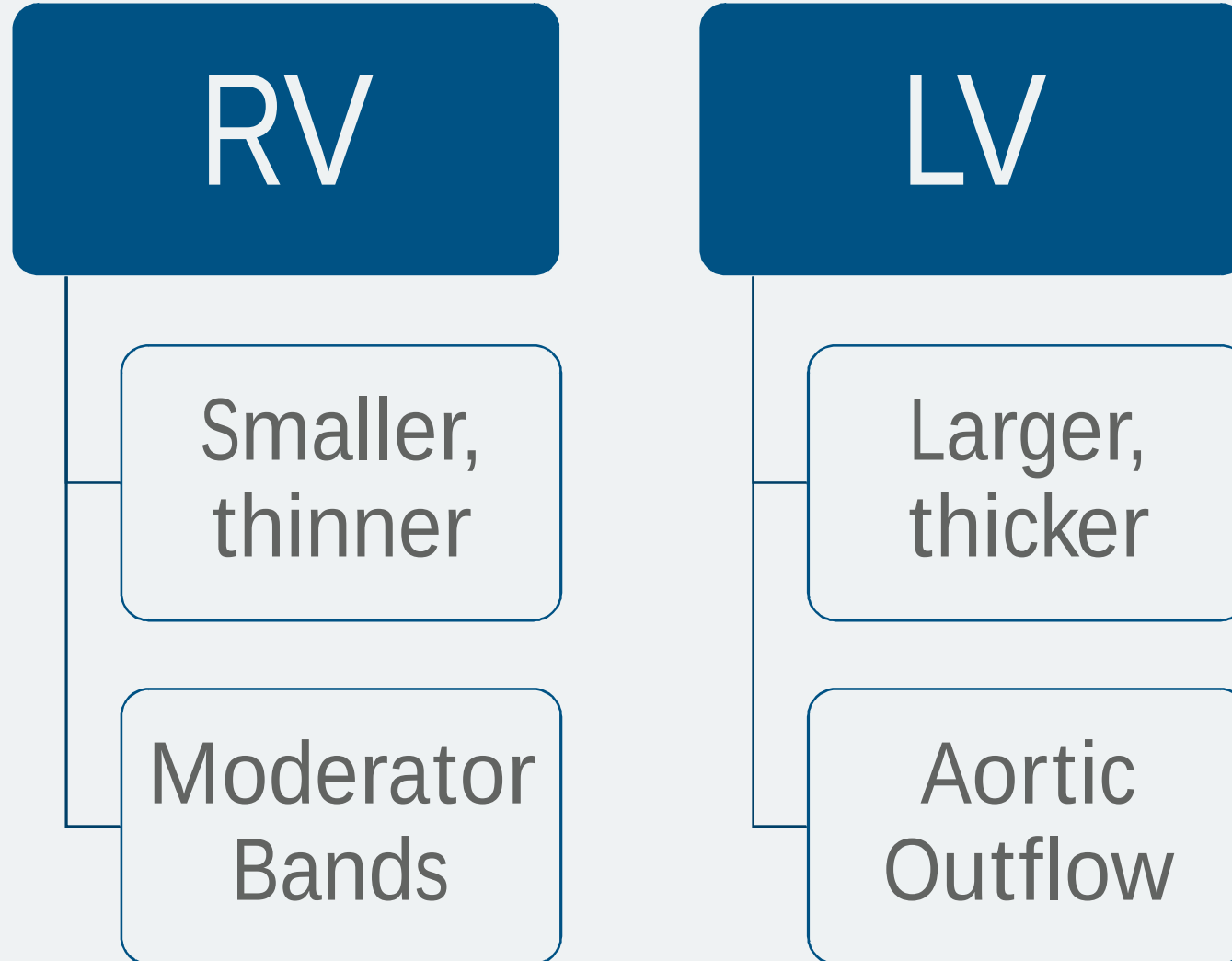


Apical 4 chamber view

Apical 4 chamber



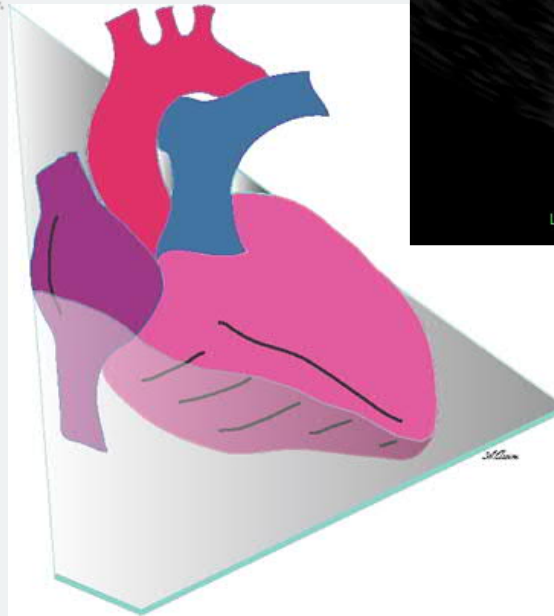
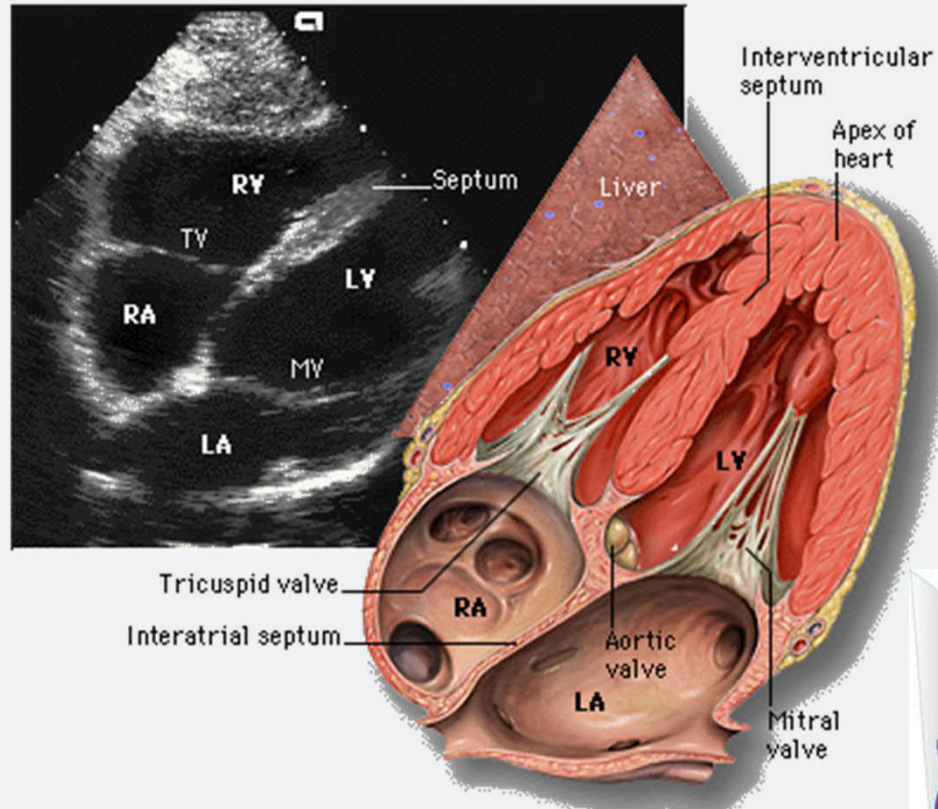
Apical 4 chamber in normal heart

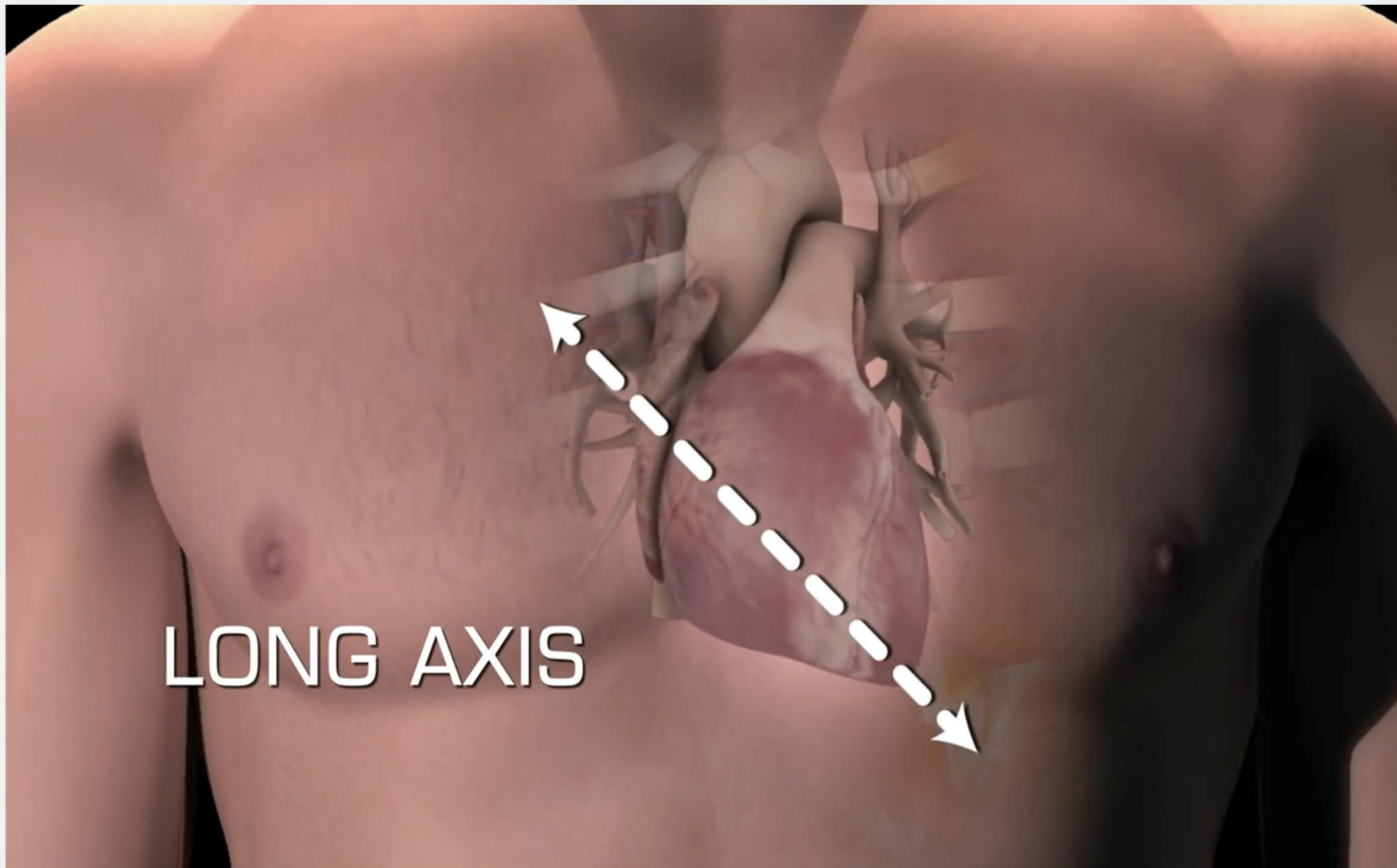




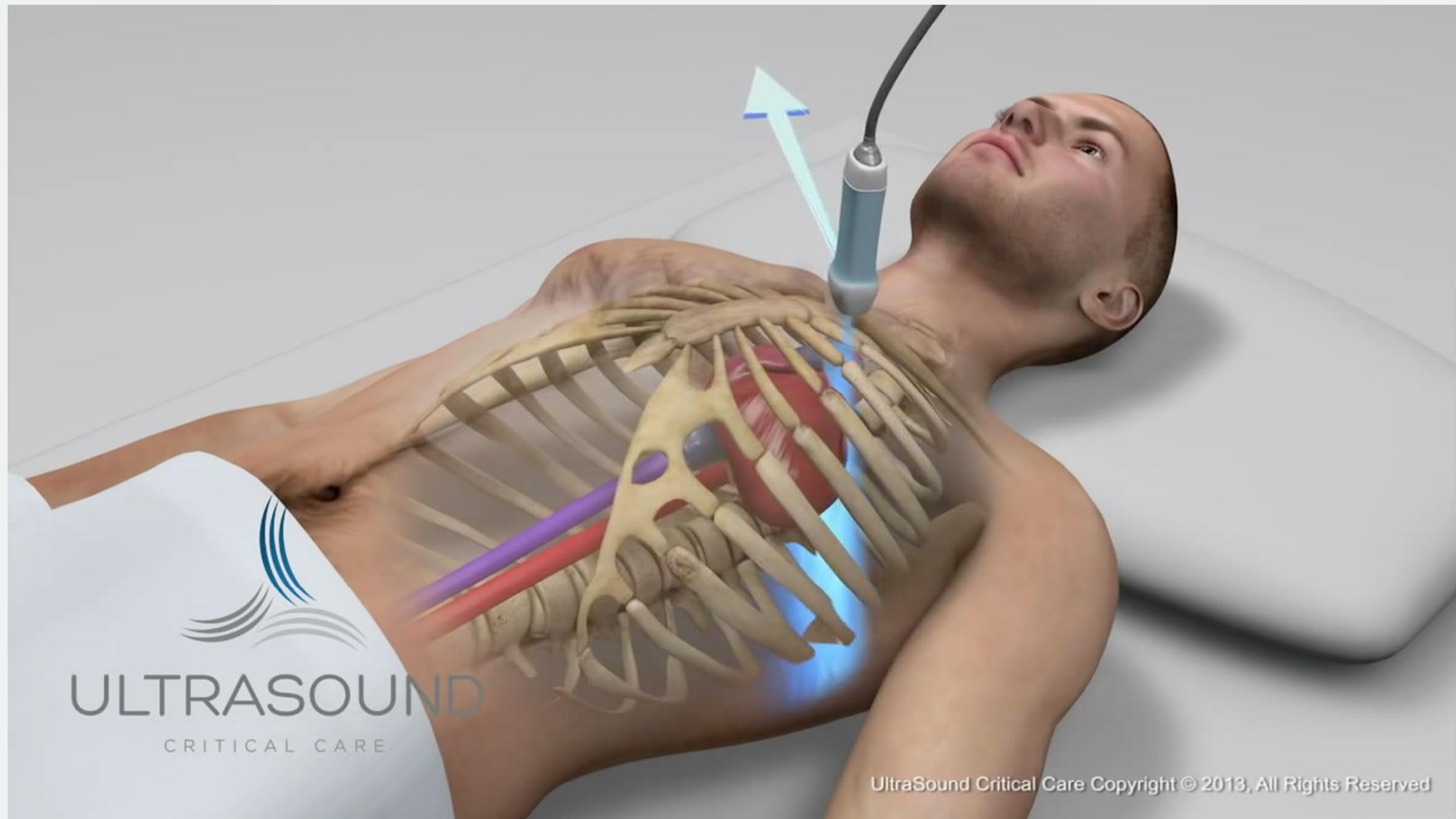
Subxiphoid or subcostal view

Subxiphoid or subcostal view





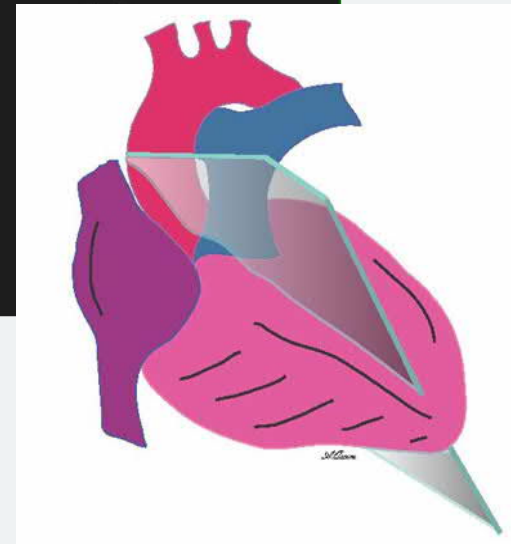
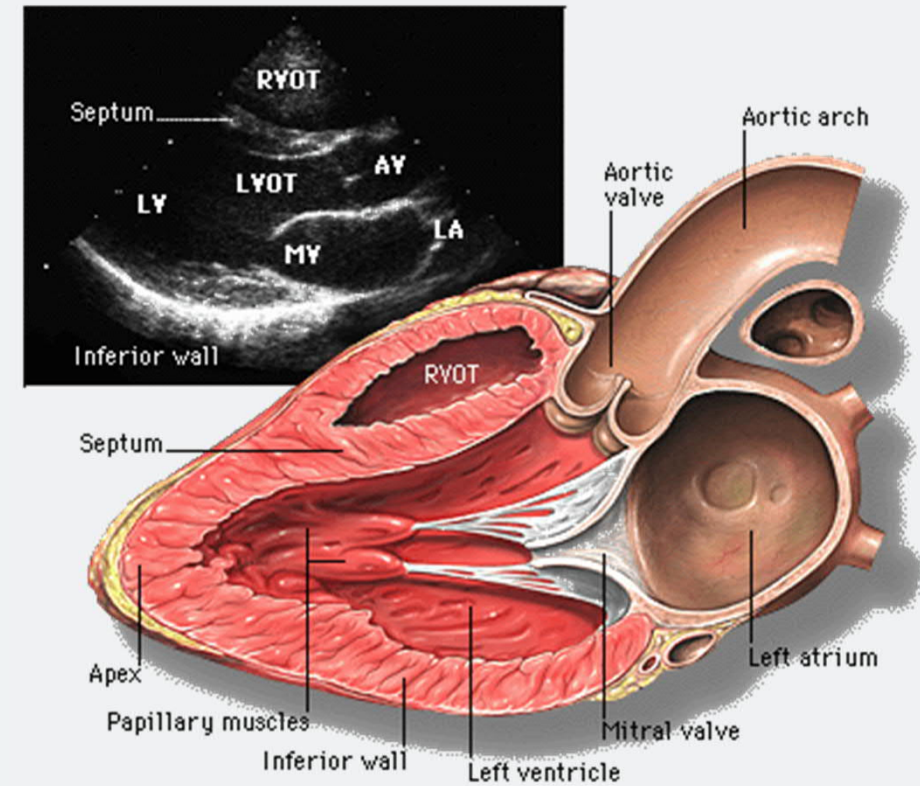
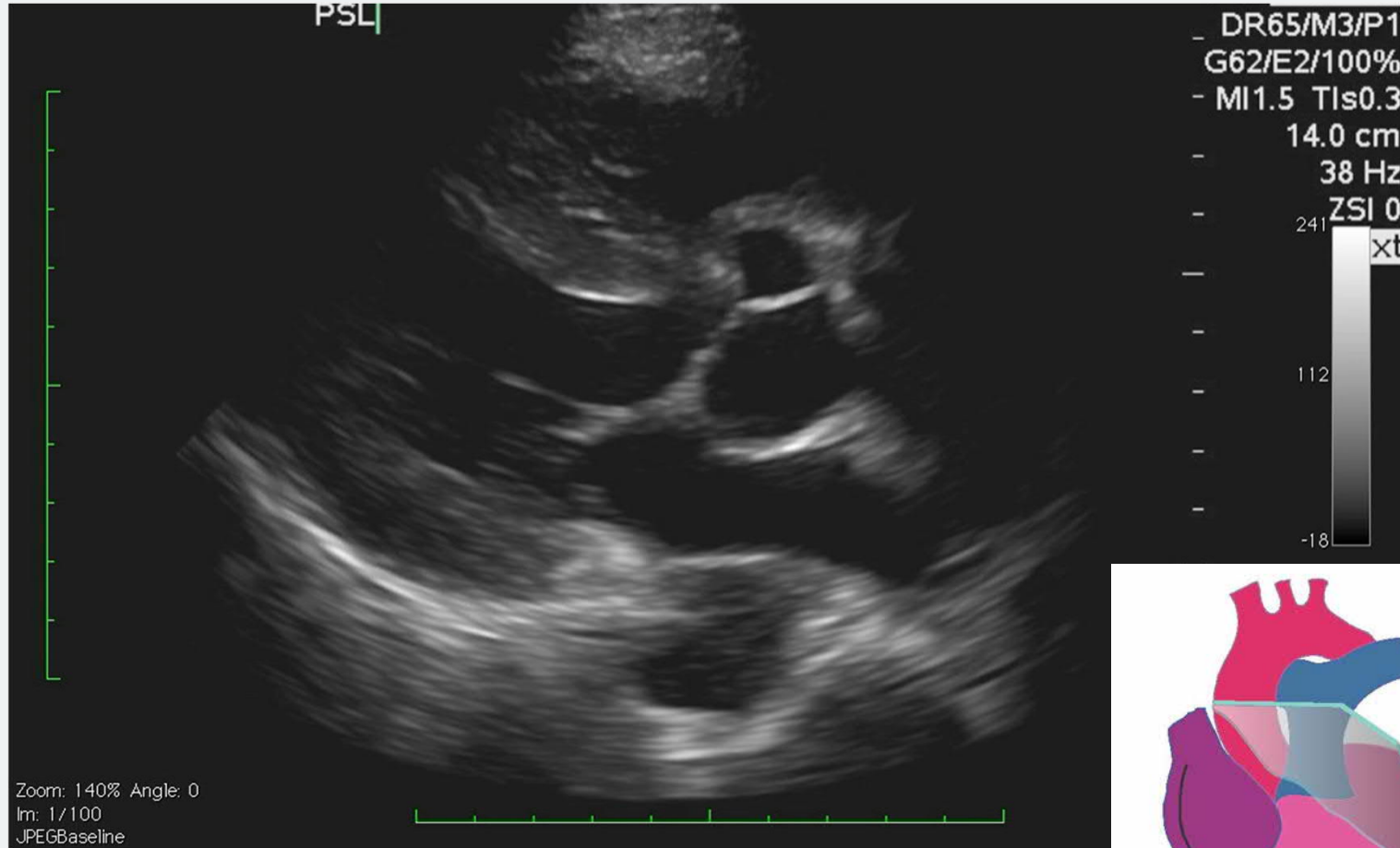
Cardiac anatomy

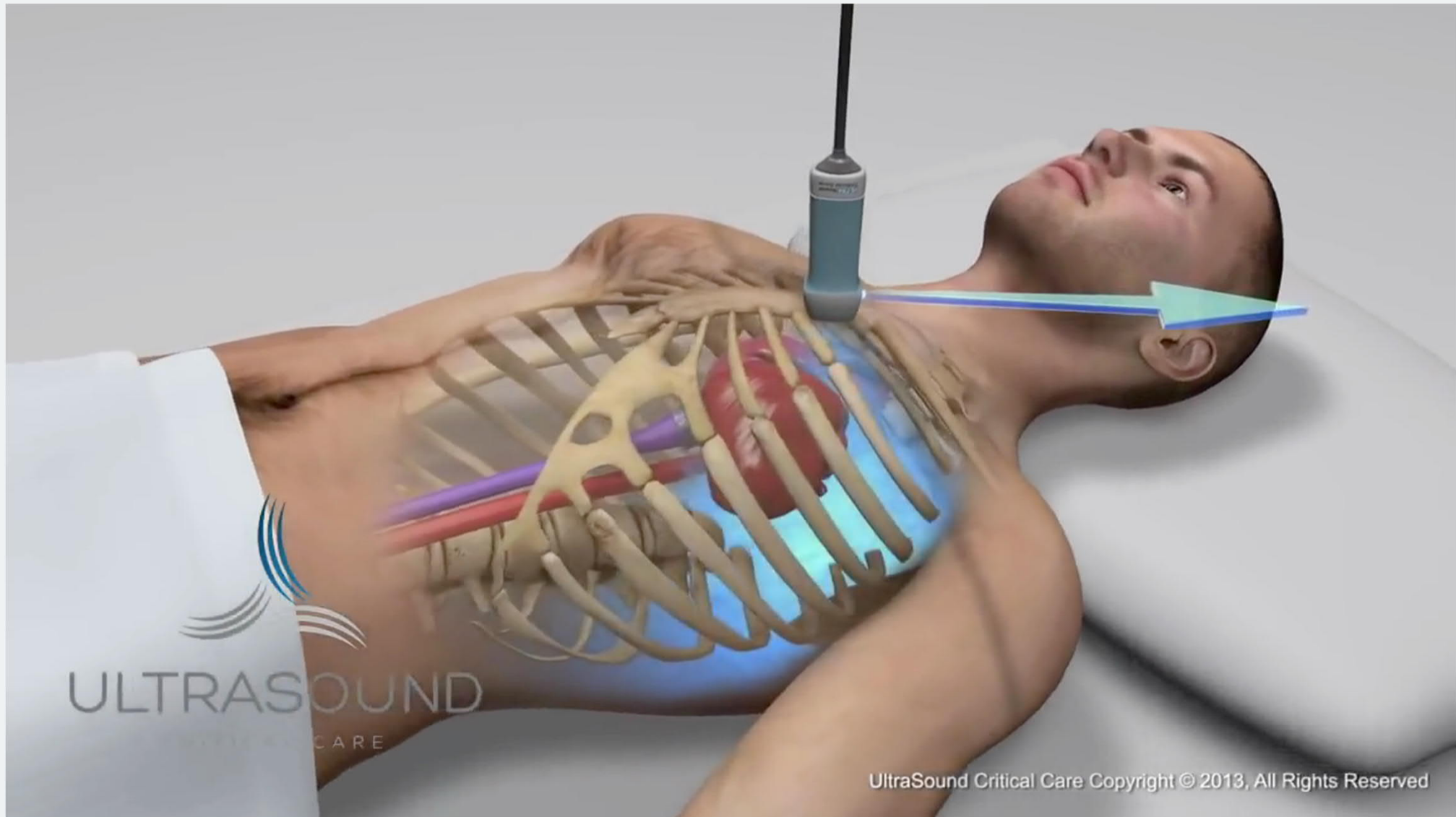


Parasternal Long axis

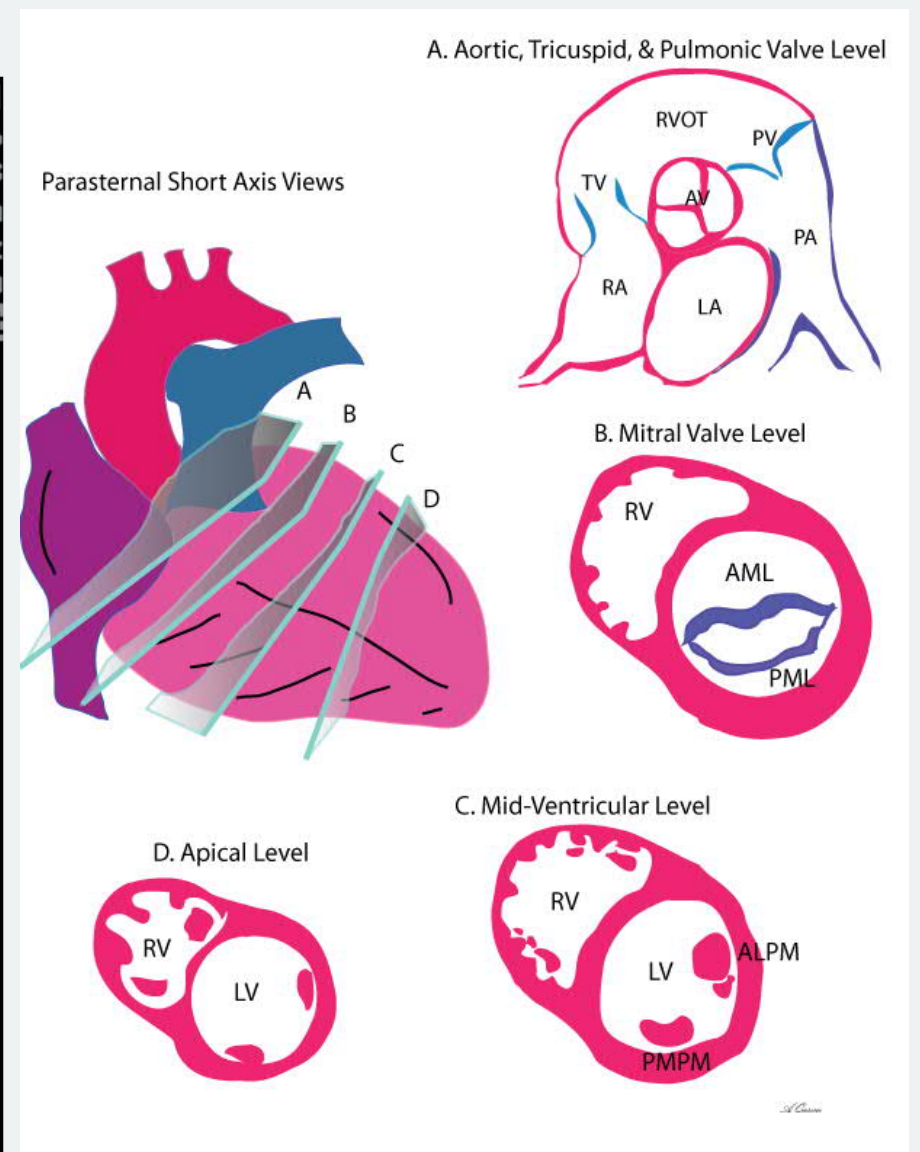
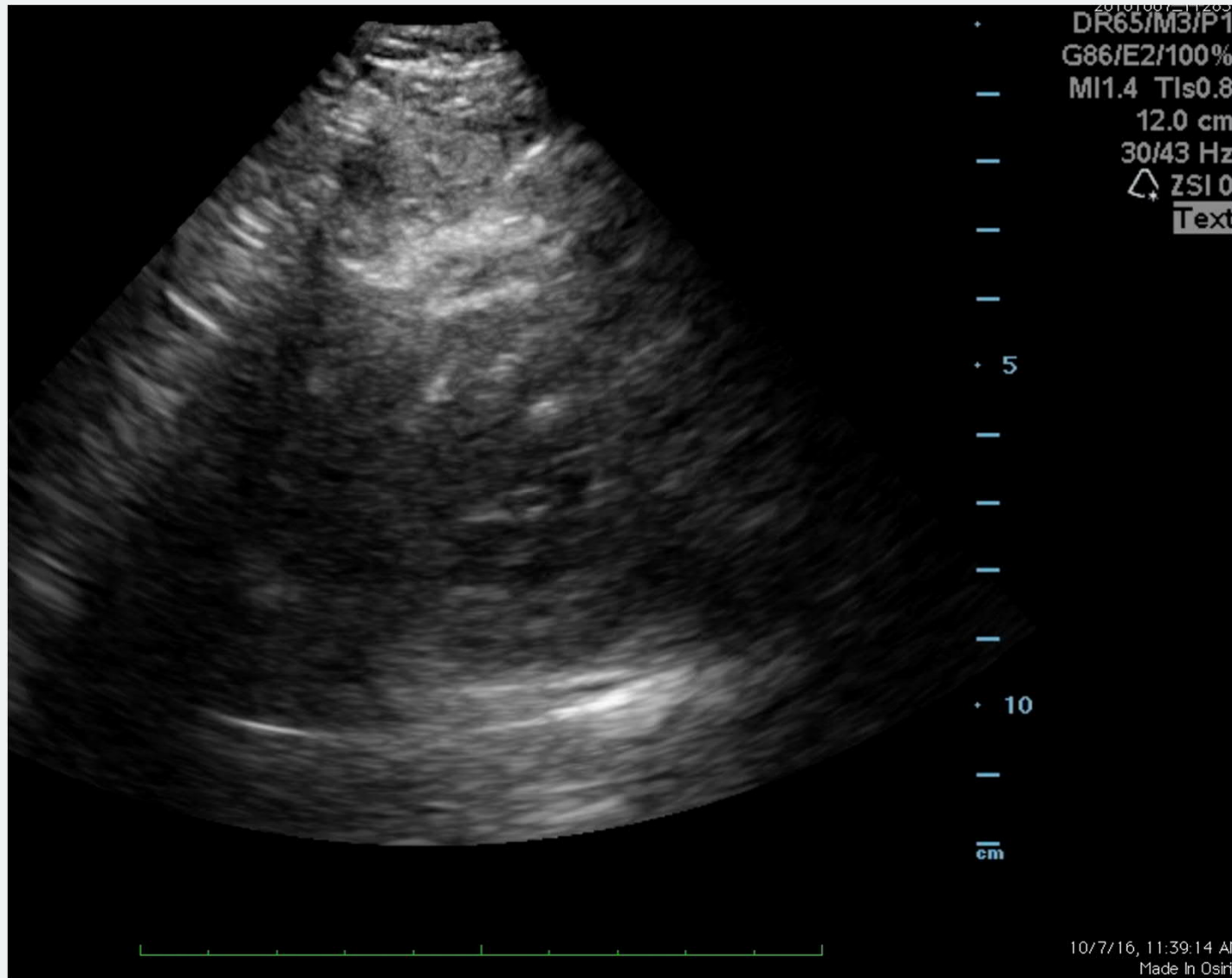
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Parasternal long axis

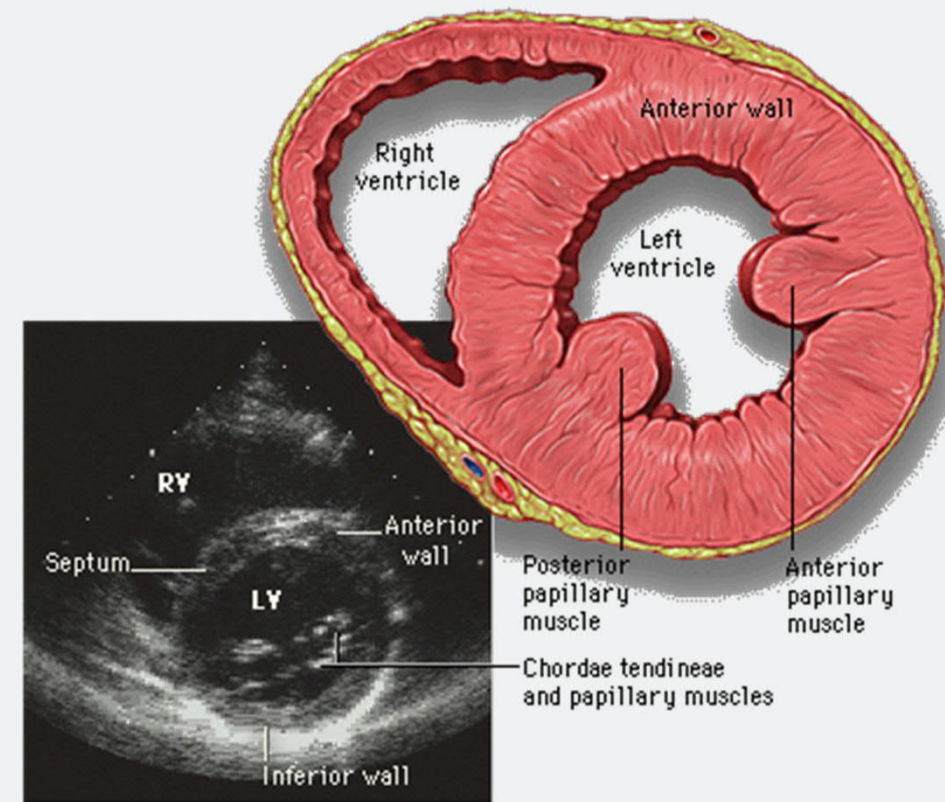
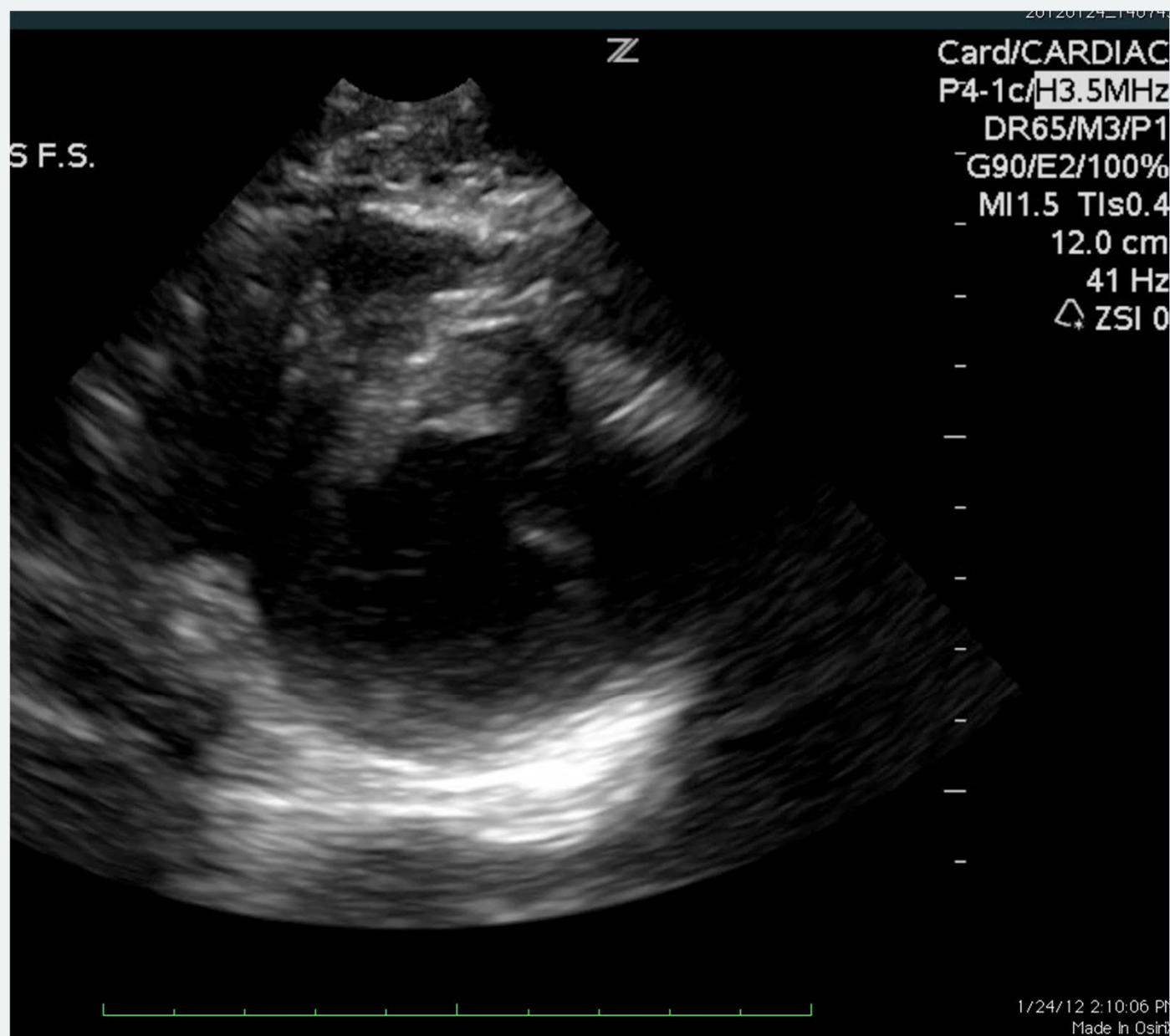




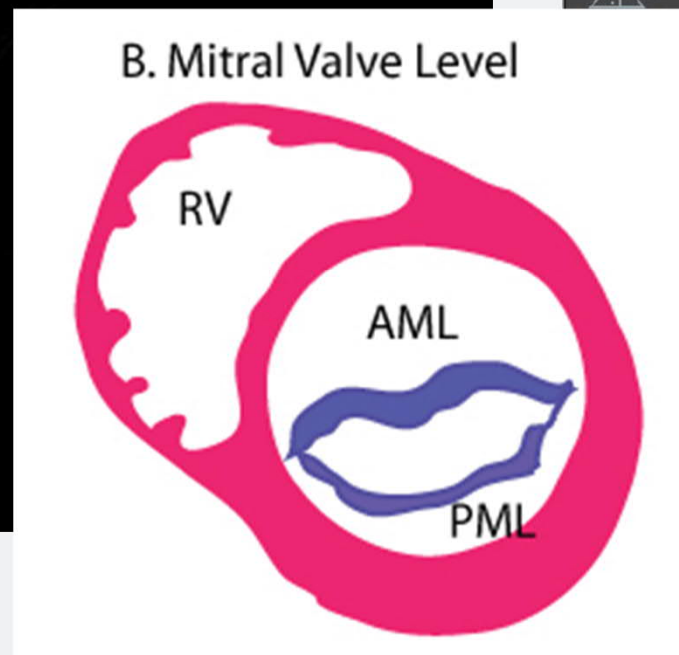
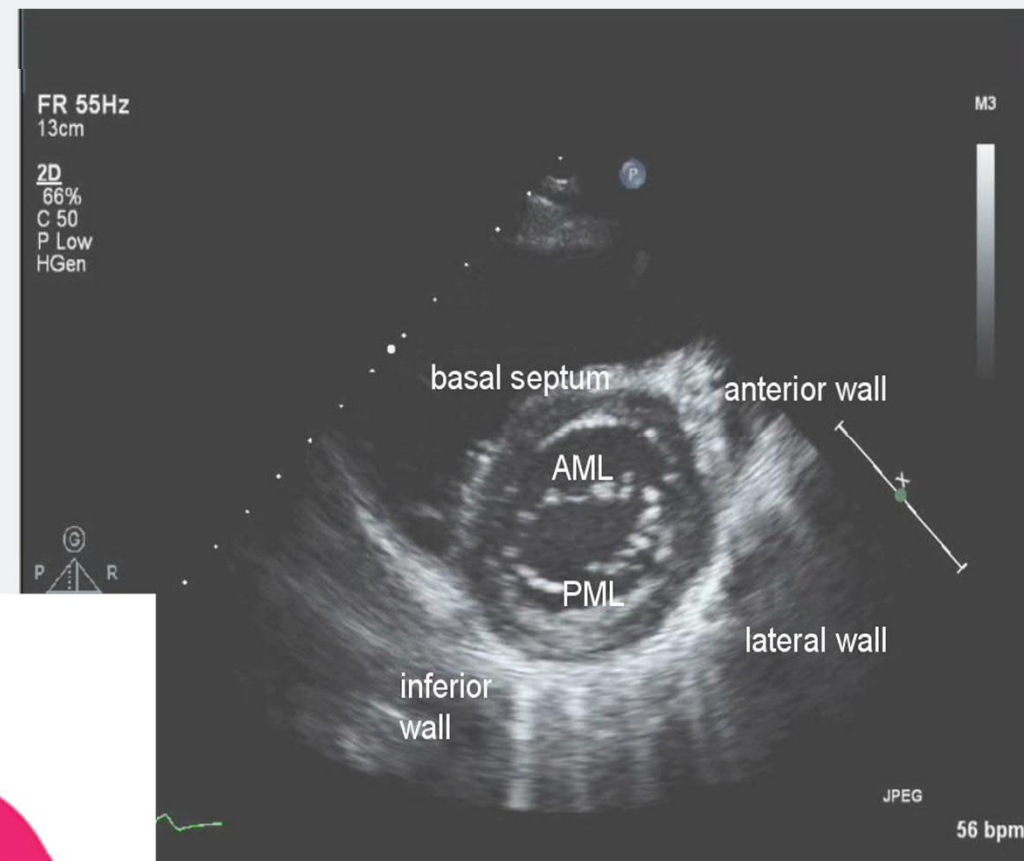
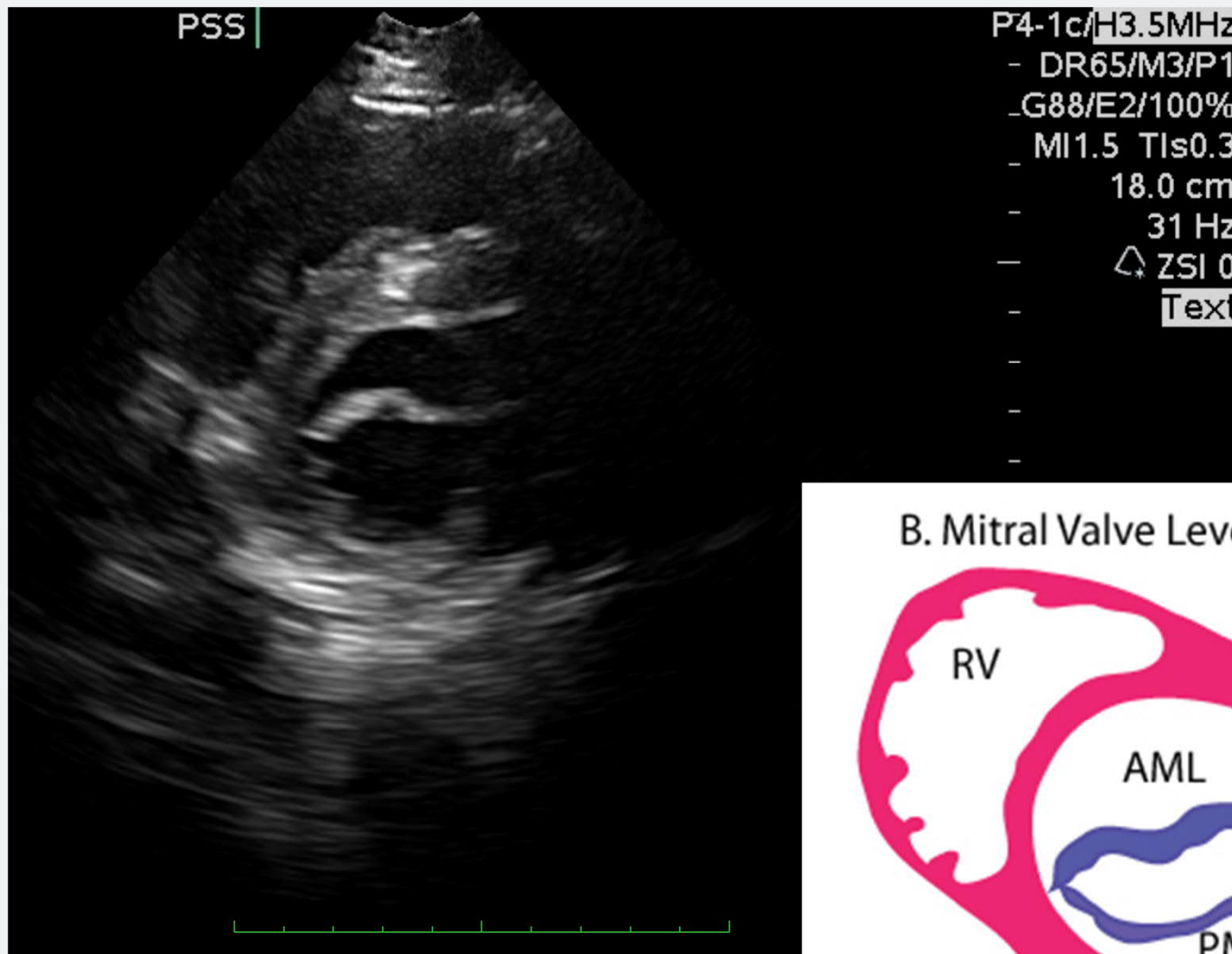
Parasternal short axis



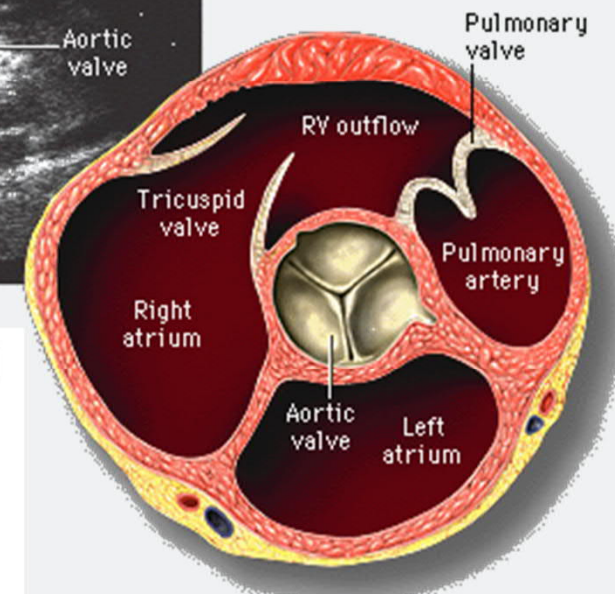
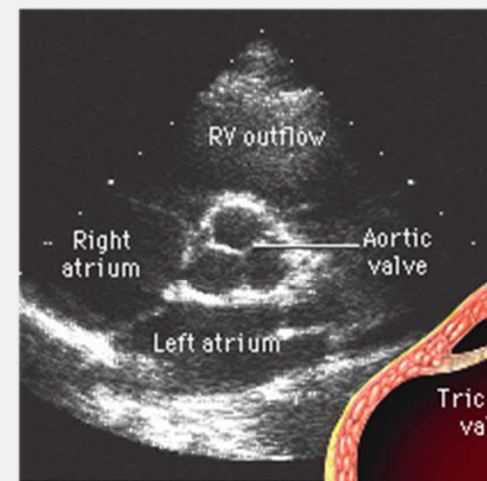
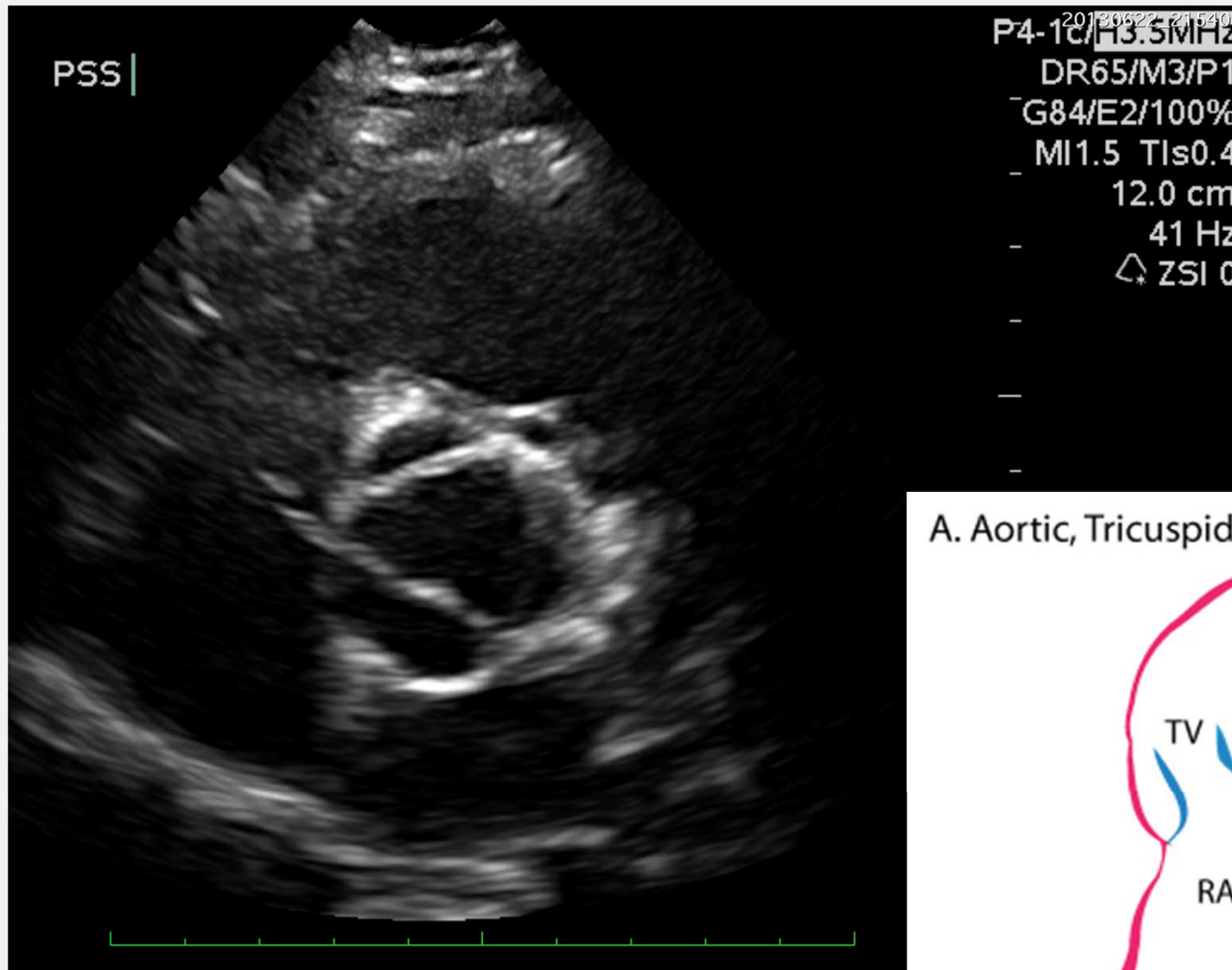
Parasternal short axis



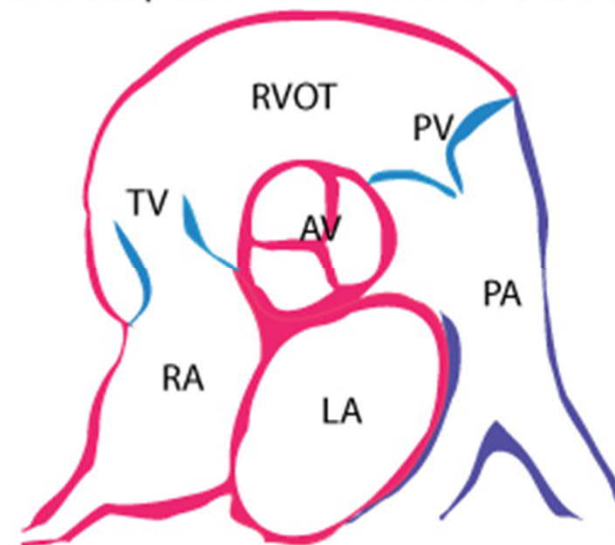
Parasternal short axis @Apex



Parasternal short axis @Mitral Valve



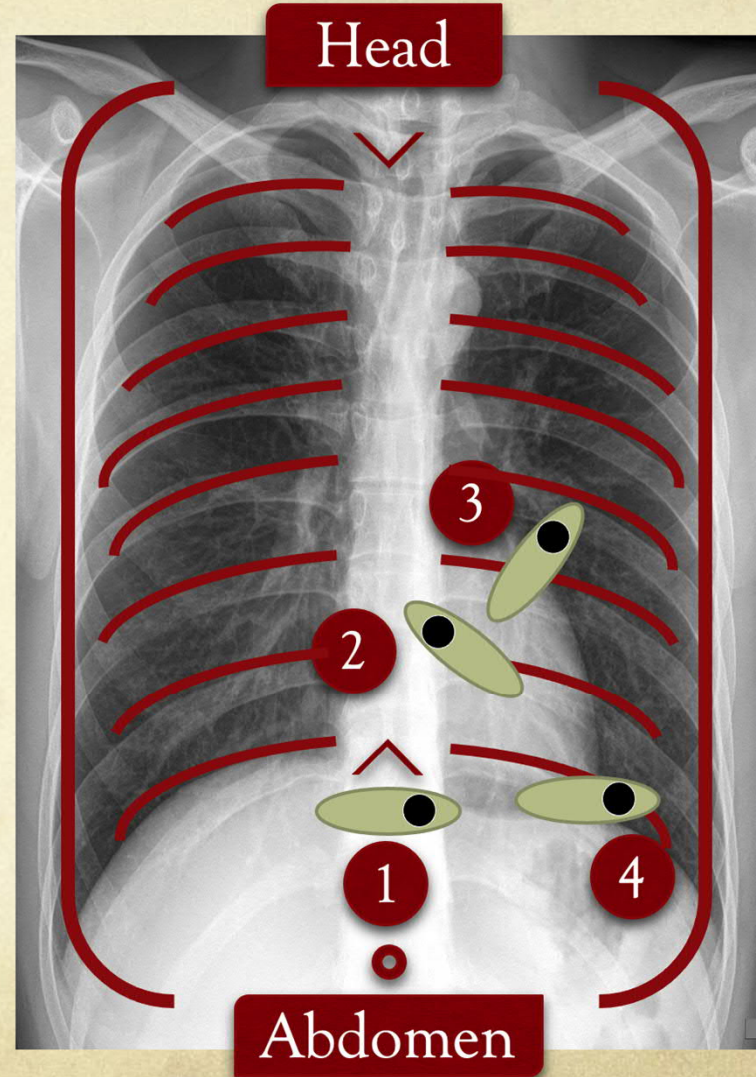
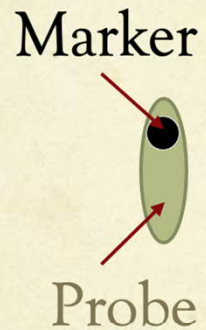
A. Aortic, Tricuspid, & Pulmonic Valve Level



Parasternal short axis @Aortic Valve

Echo

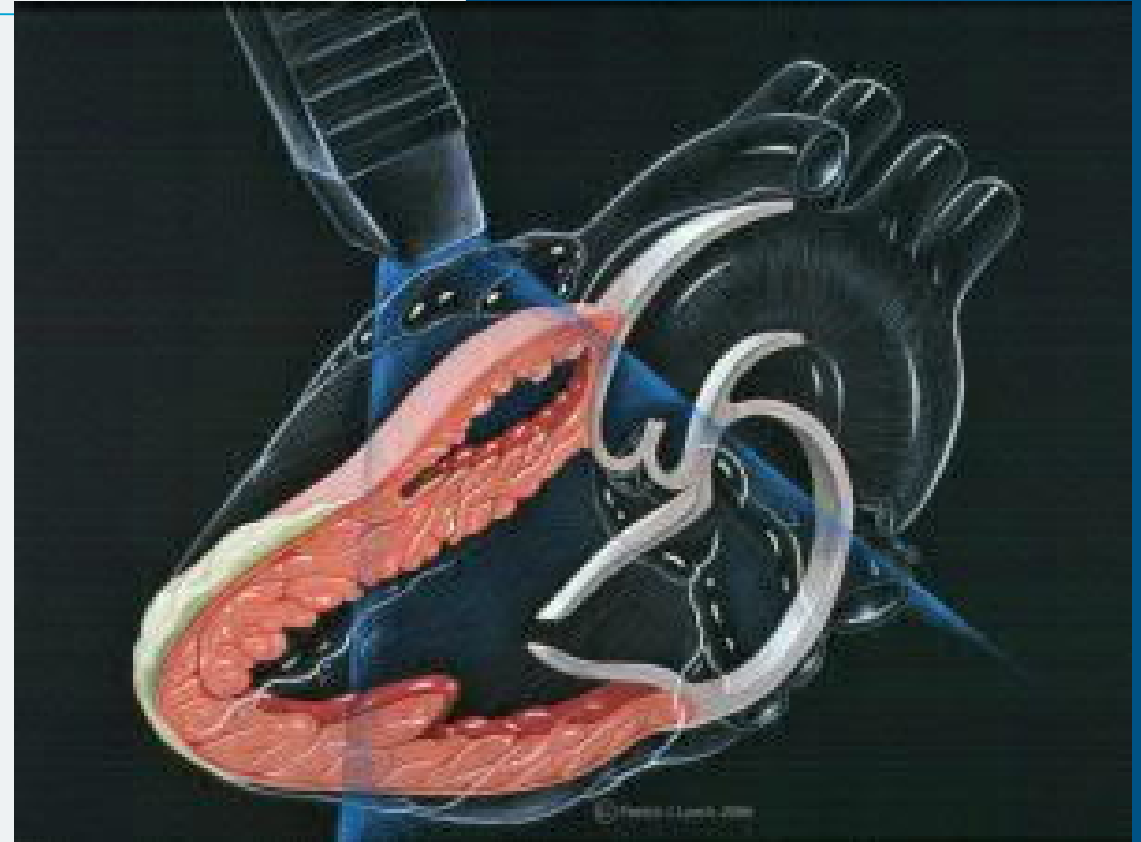
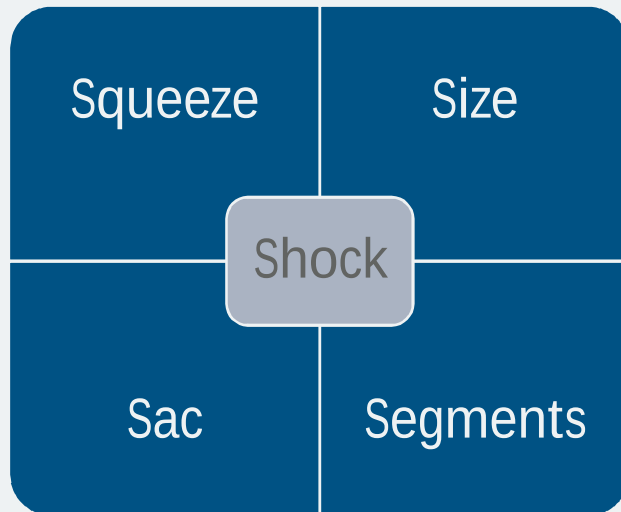
- 1 Subxiphoid
- 2 Parasternal Long Axis
- 3 Parasternal Short Axis
- 4 4-Chamber Apical



Probe Position

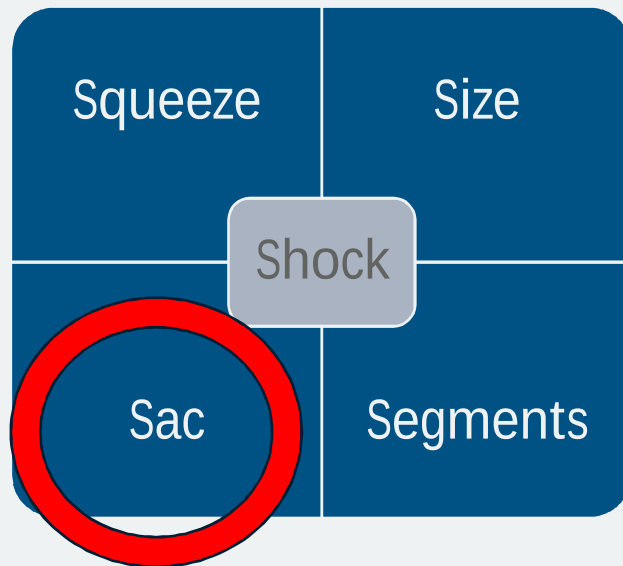
Case: The S's of Focused Echo

- 65 y/o patient with Pmhx CAD s/p stent, CHF (HFrEF) and recent cancer diagnosis presents with chest pain and SOB.

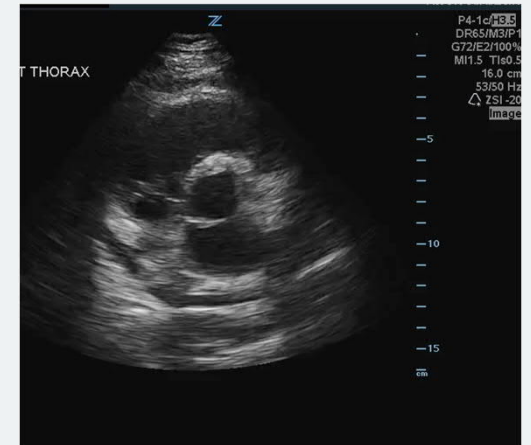
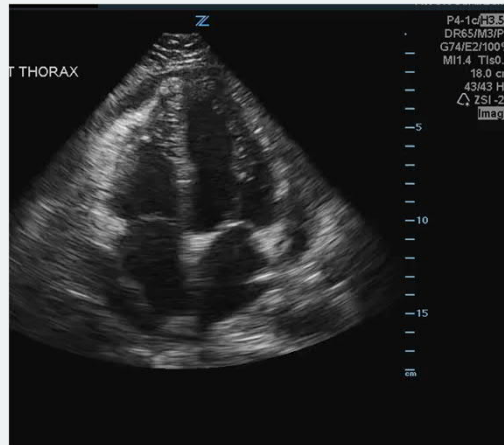


Case: The S's of Focused Echo

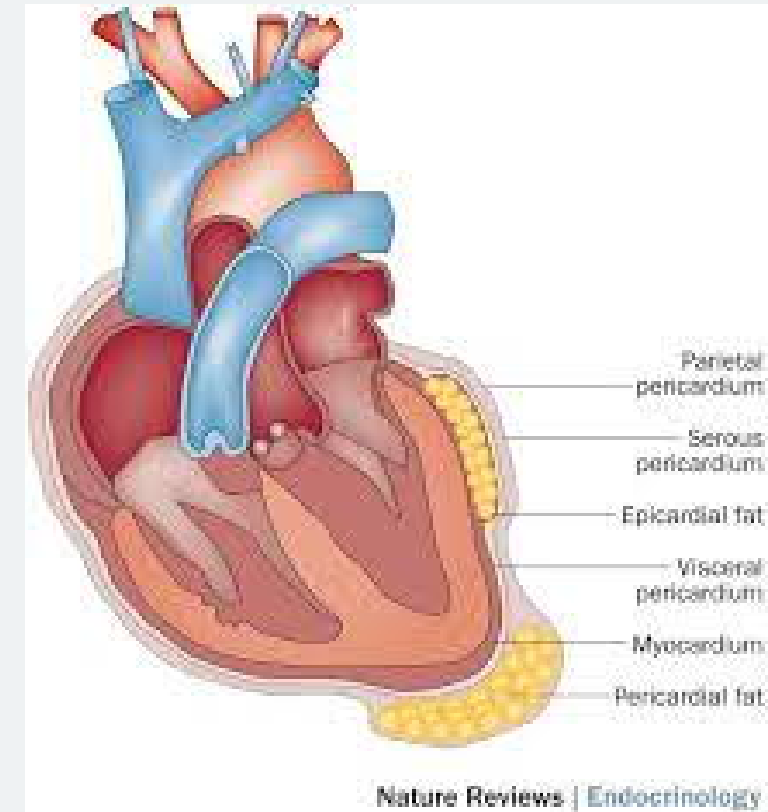
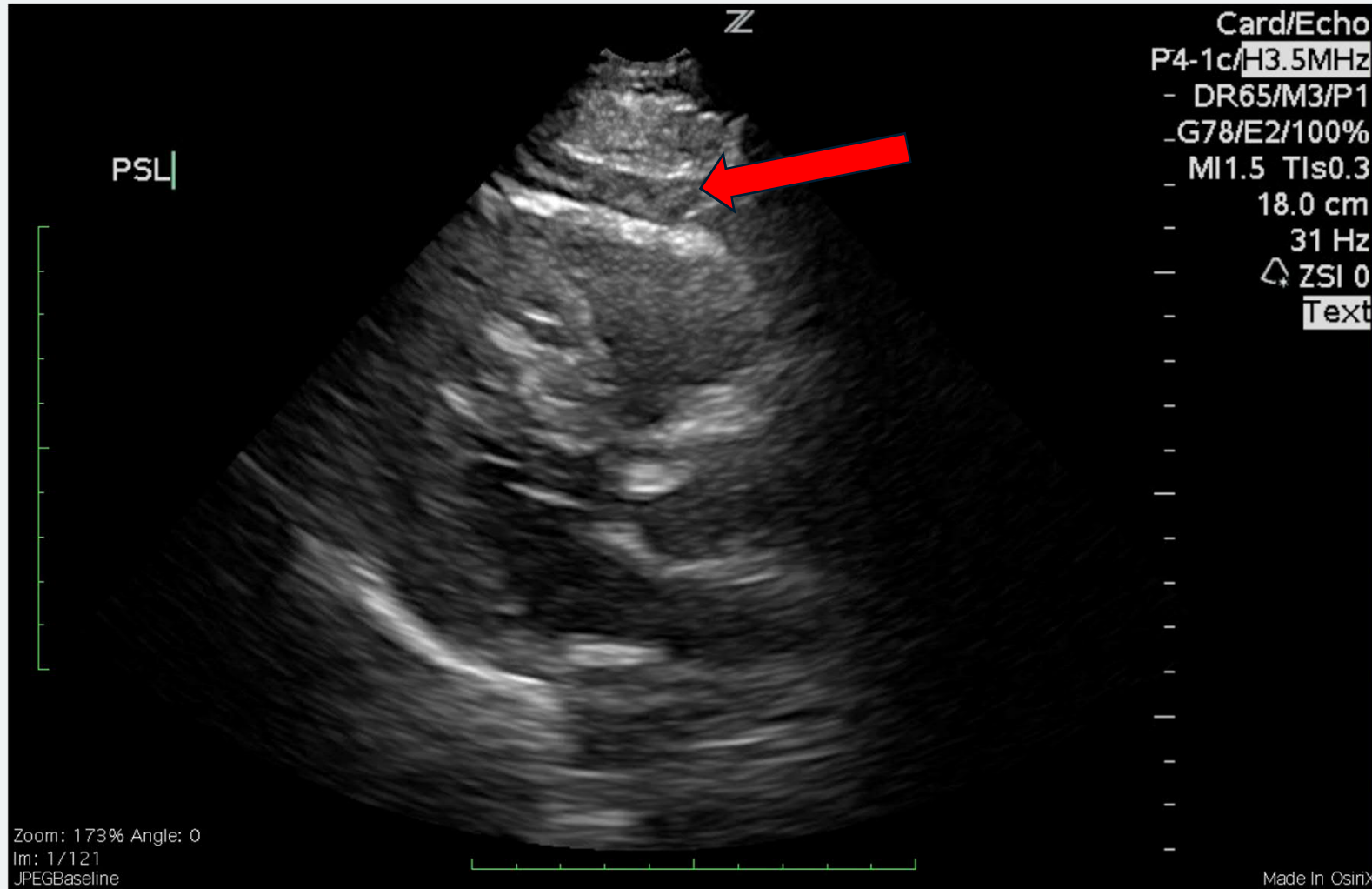
- 65 y/o patient with Pmhx CAD s/p stent, CHF (HFrEF) and recent cancer diagnosis presents with chest pain and SOB.



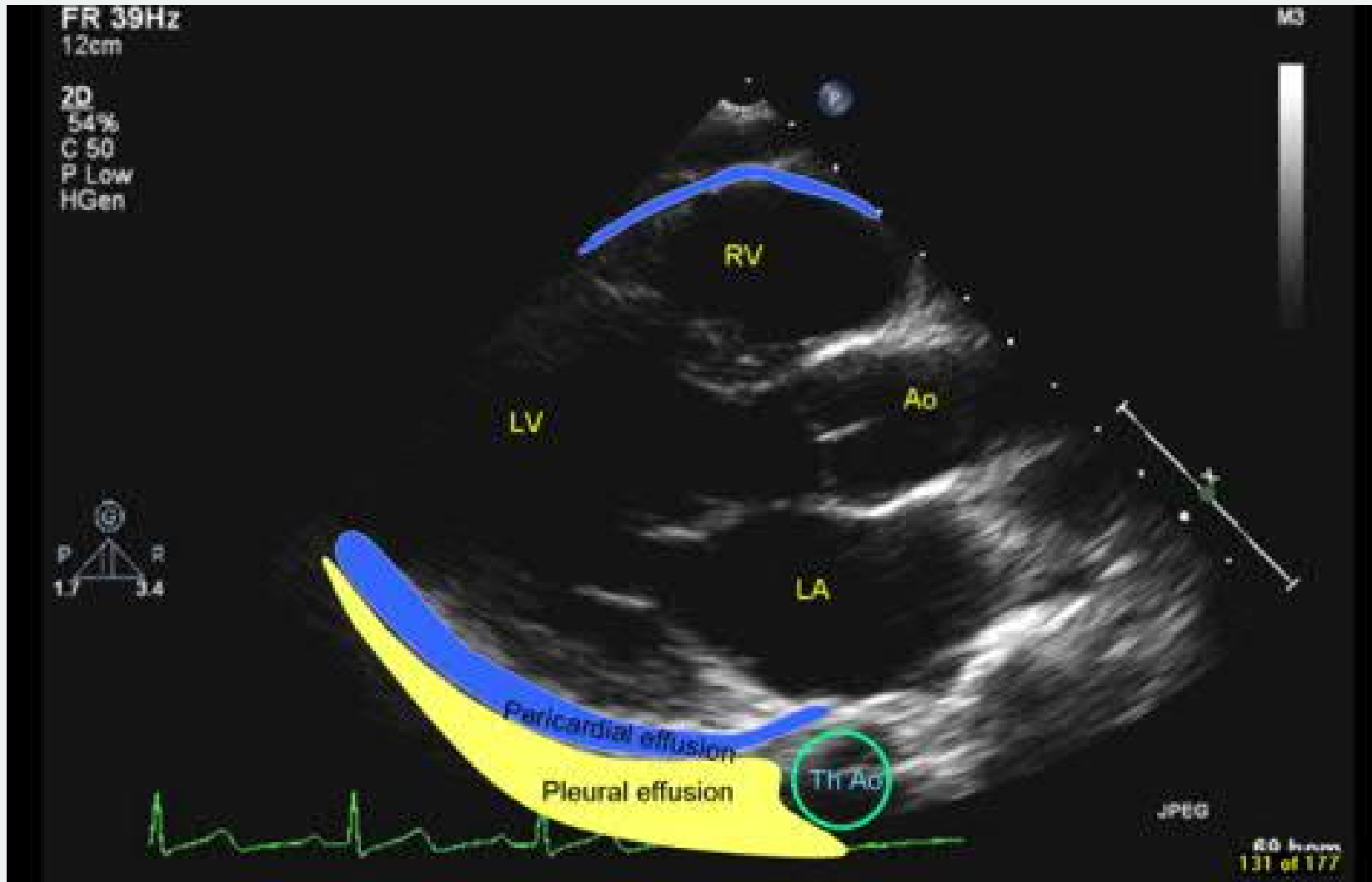
Sac: Pericardial Effusion



Sac: Pericardial Effusion Mimic Fat Pad

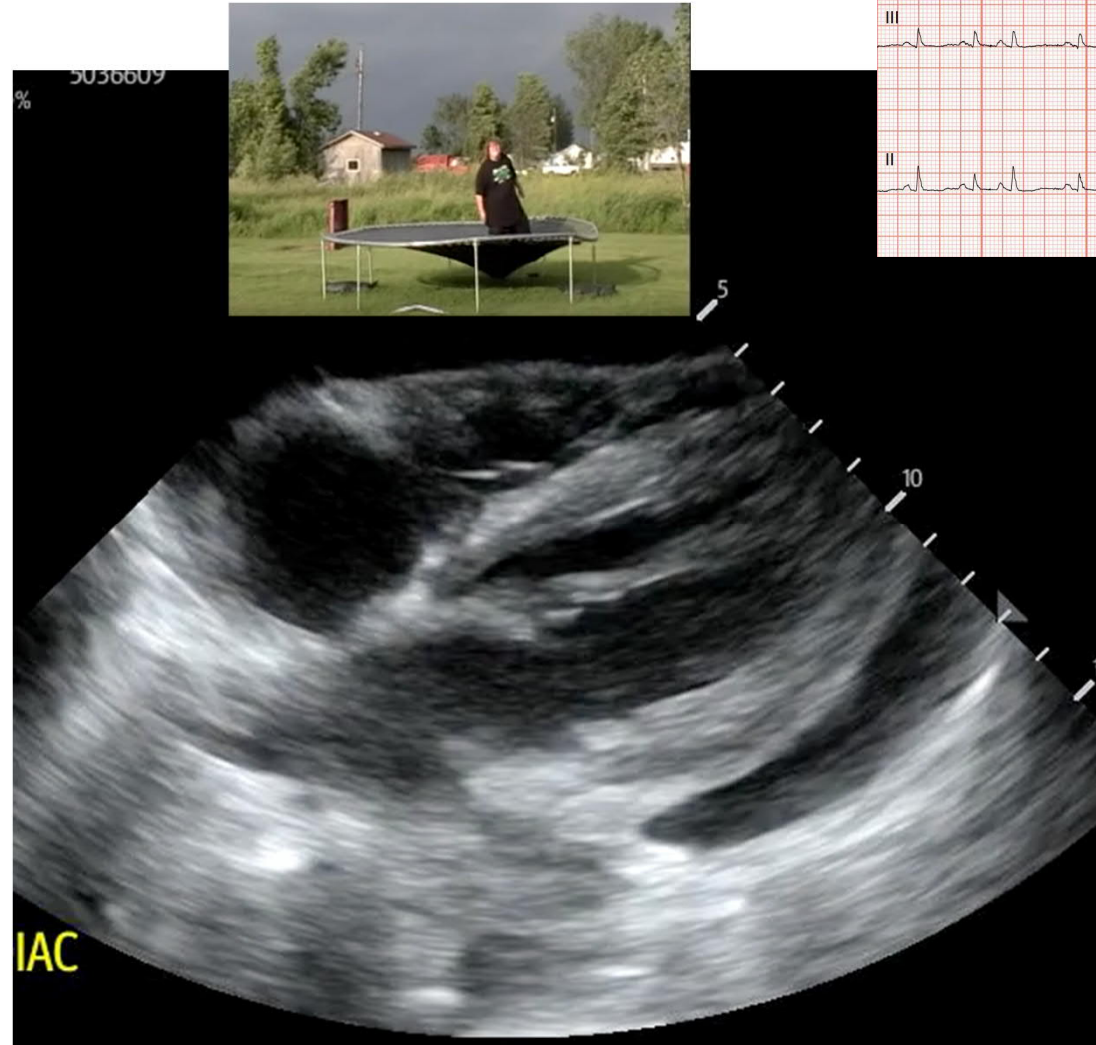
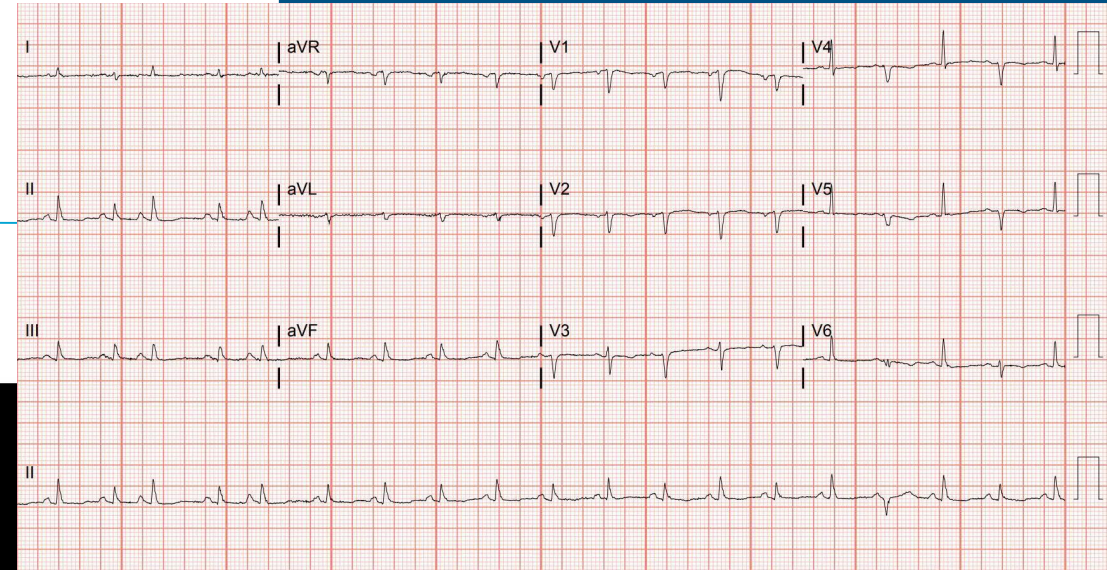


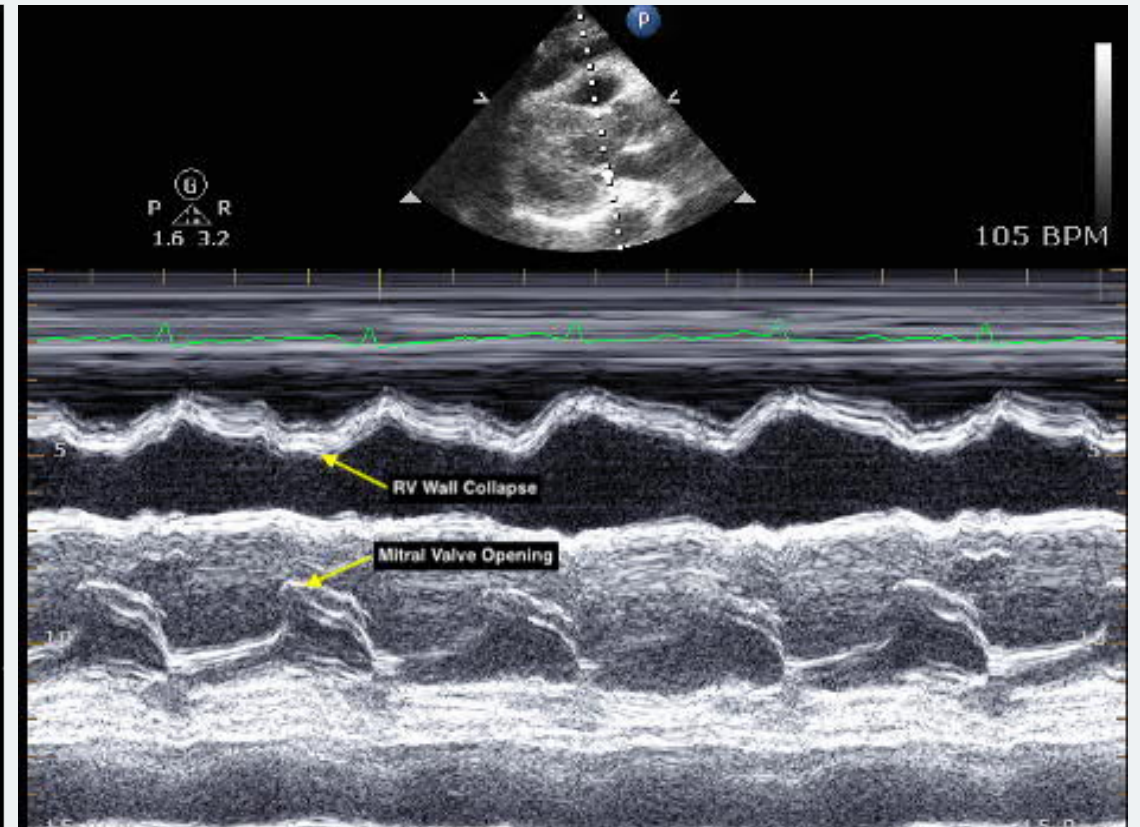
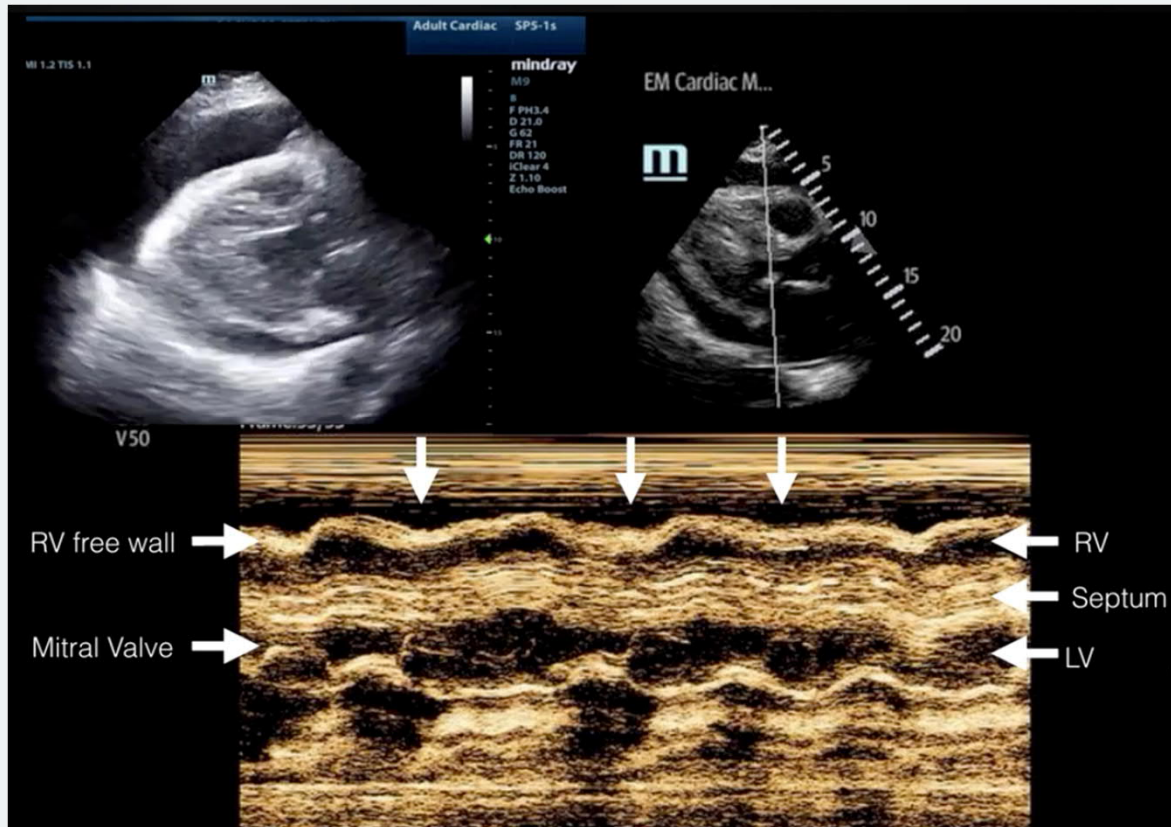
SAC: Pericardial vs Pleural effusion



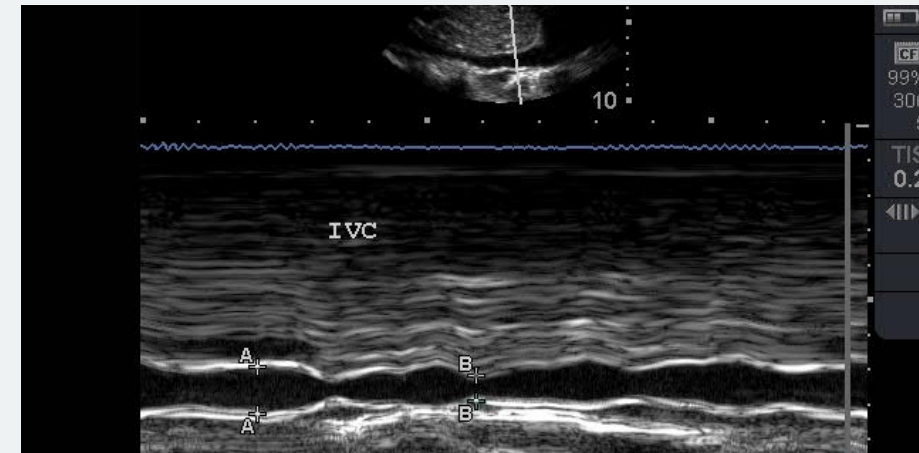
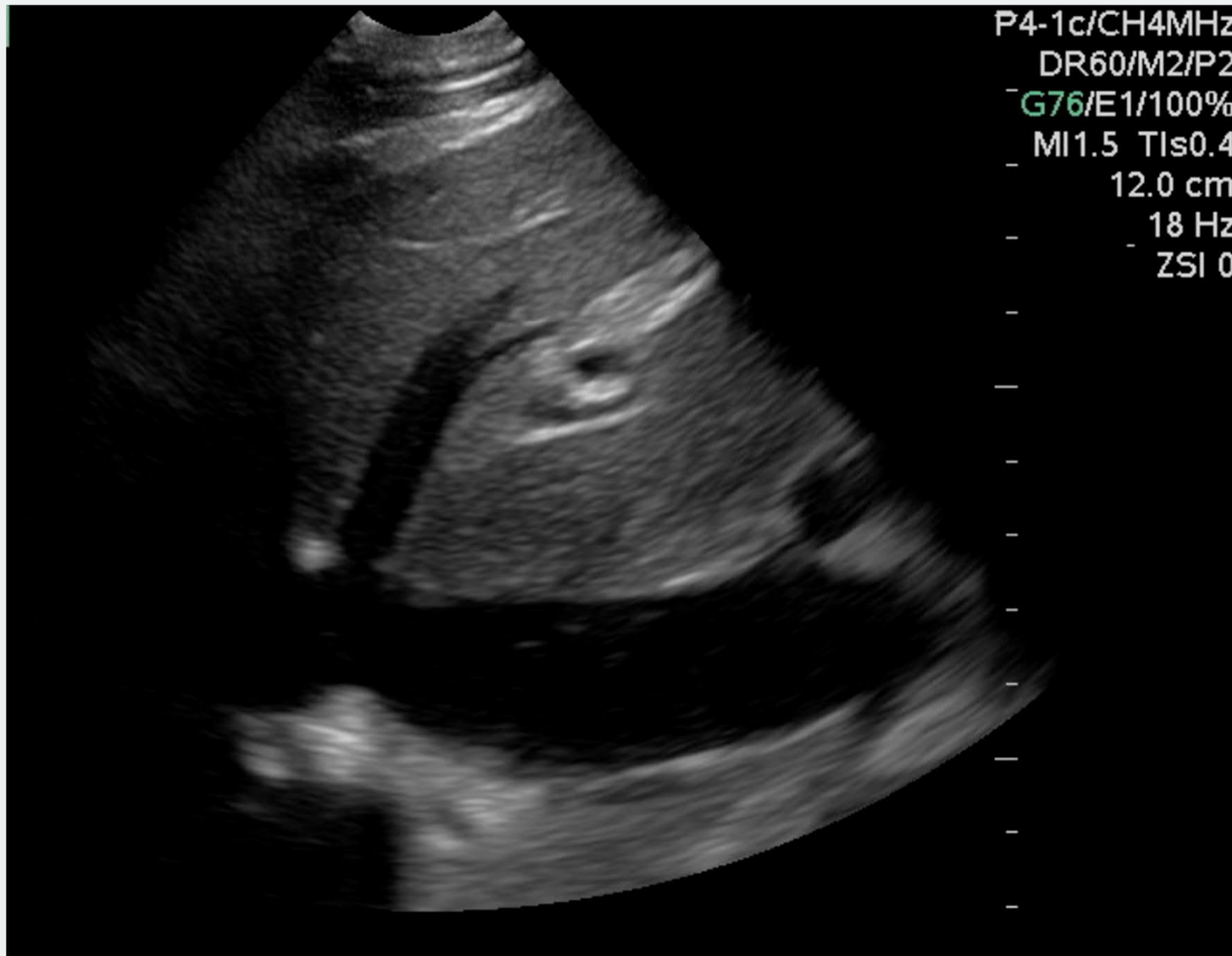
Sac: Pericardial Effusion

- Tamponade





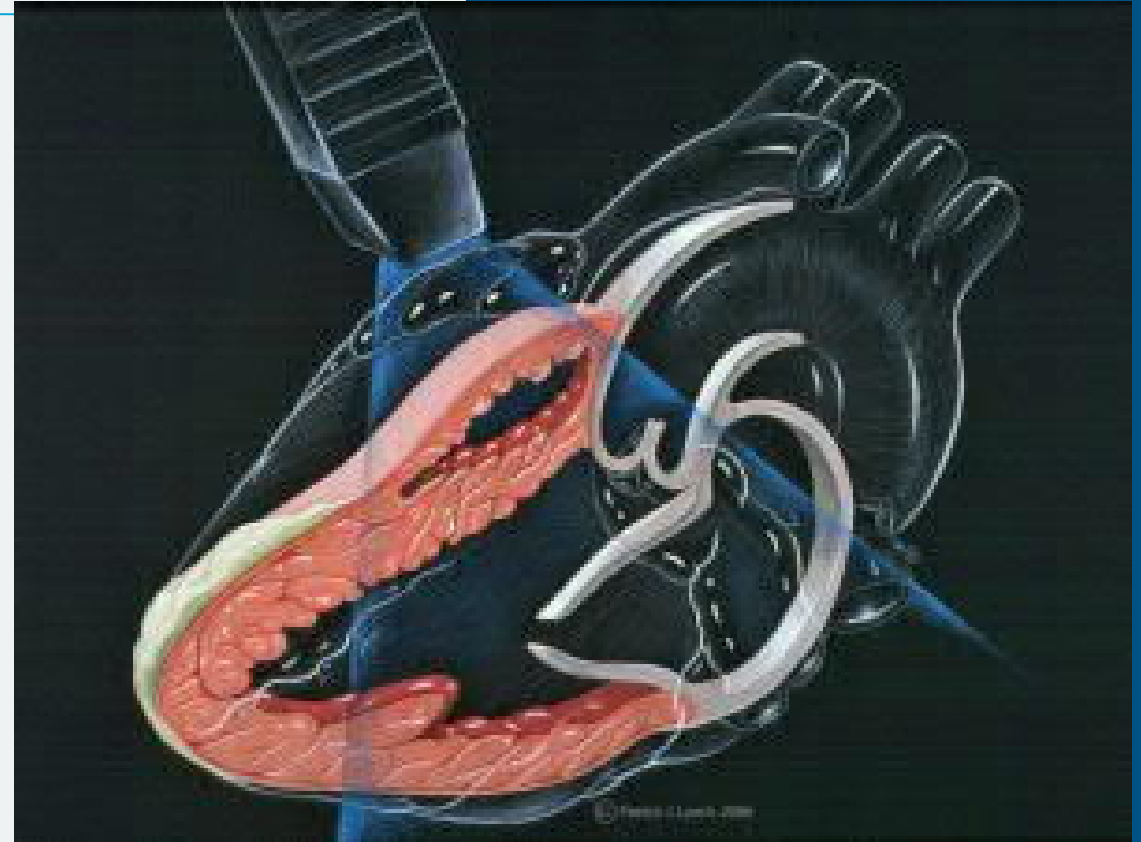
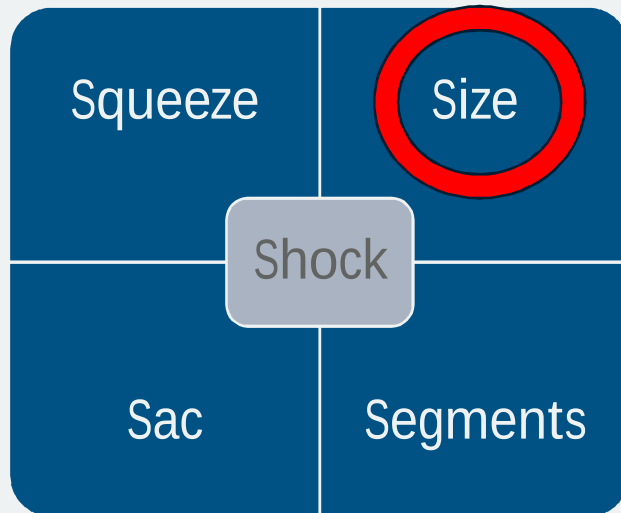
Sac: Tamponade



Tamponade: Plethoric IVC

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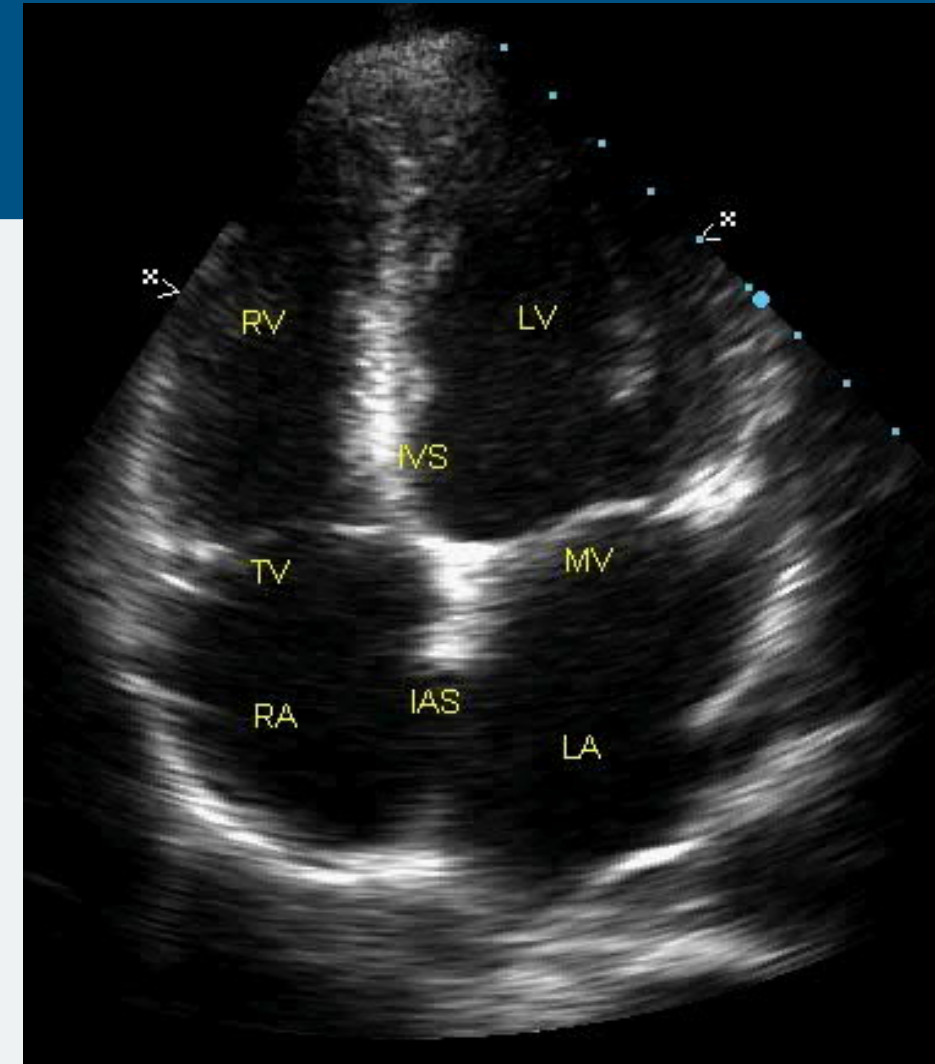
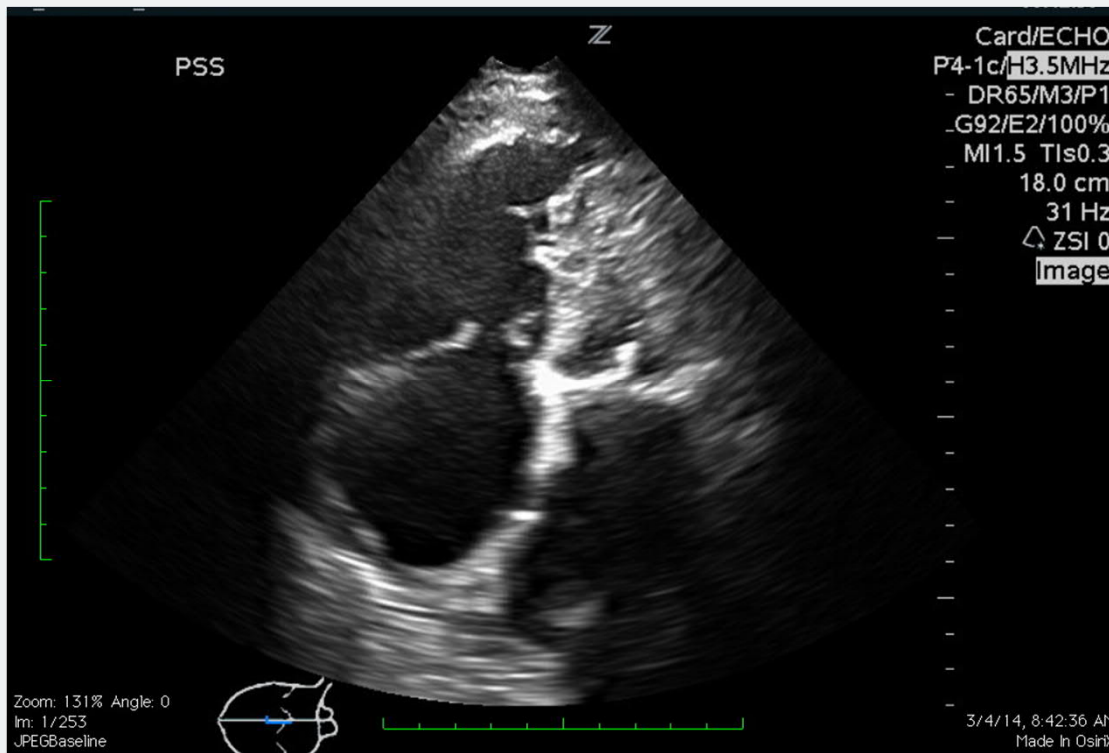


Size: Right Ventricular Chamber Size

RV usually 2/3 size of LV

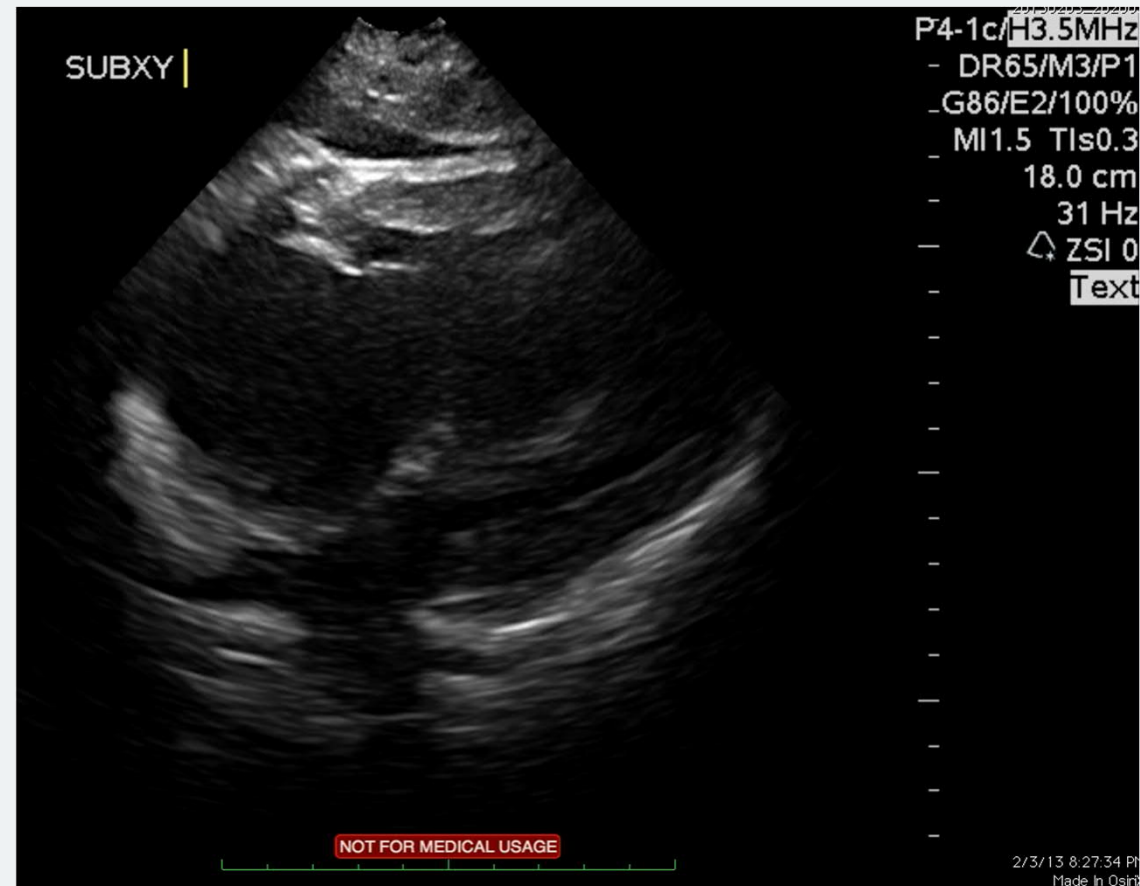
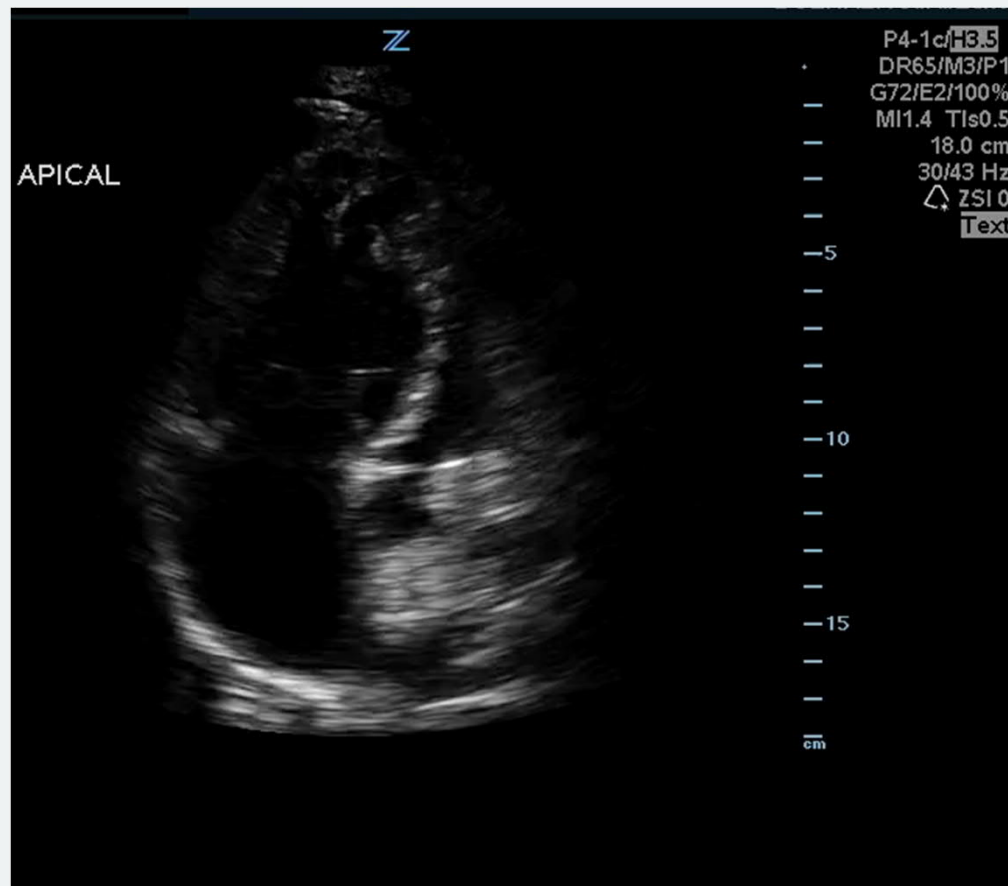
When the RV is equal or larger than LV

- Pulmonary Hypertension
- Cor Pulmonale
- Pulmonary embolus



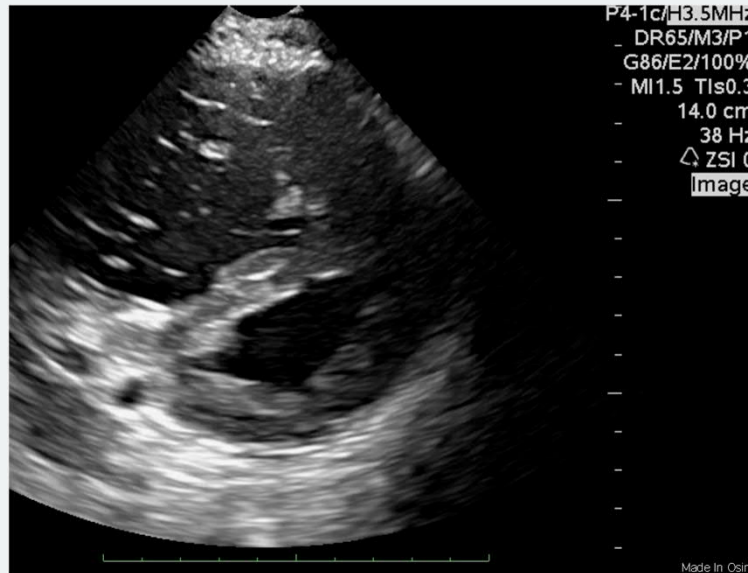
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Size: Right Ventricular Size



- RV shape best evaluated at the parasternal short axis view @mitral valve

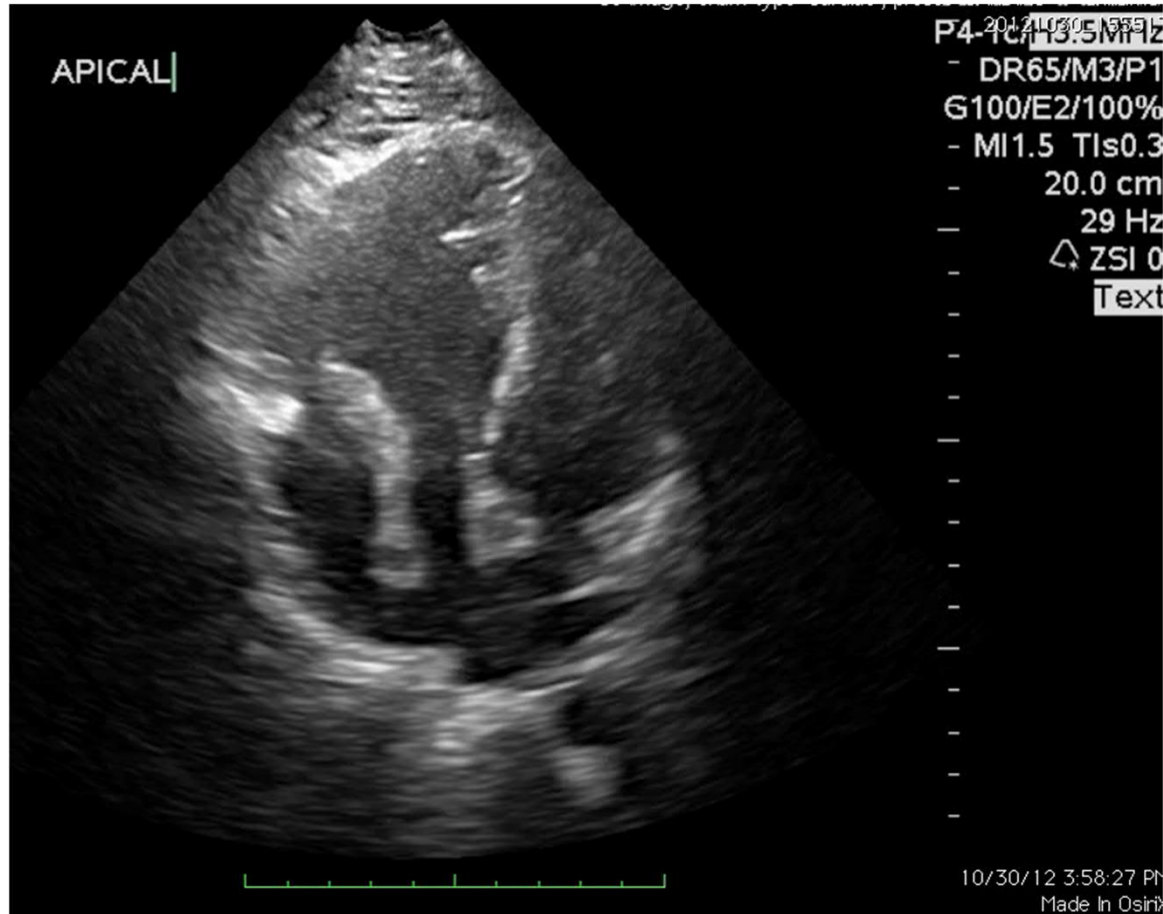
- Normally, the RV is a crescent at the top of the LV



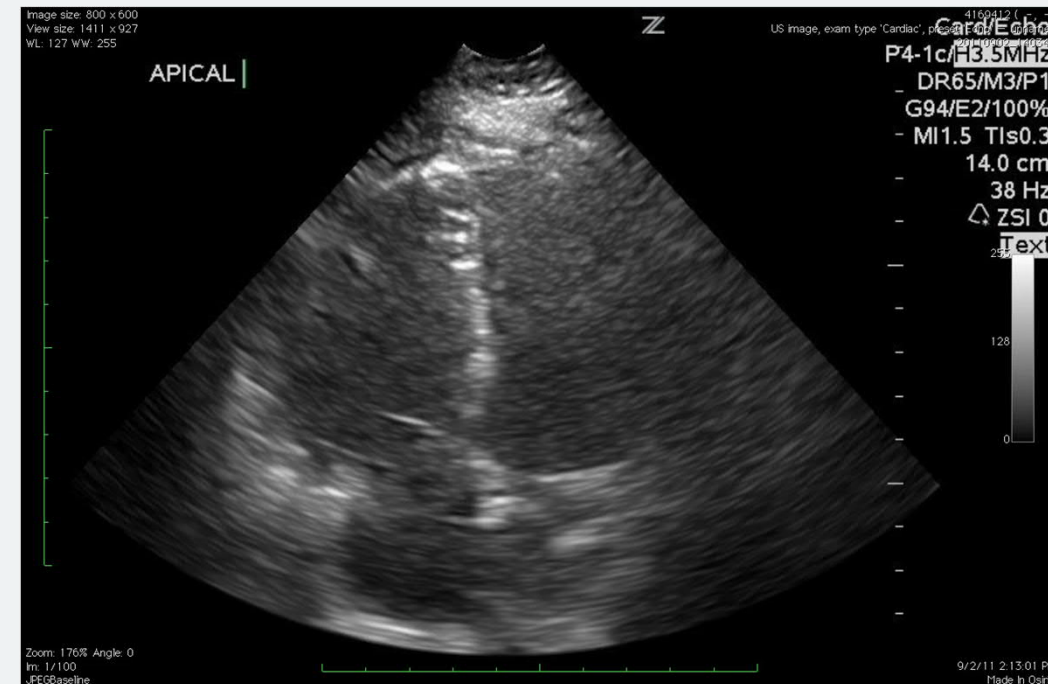
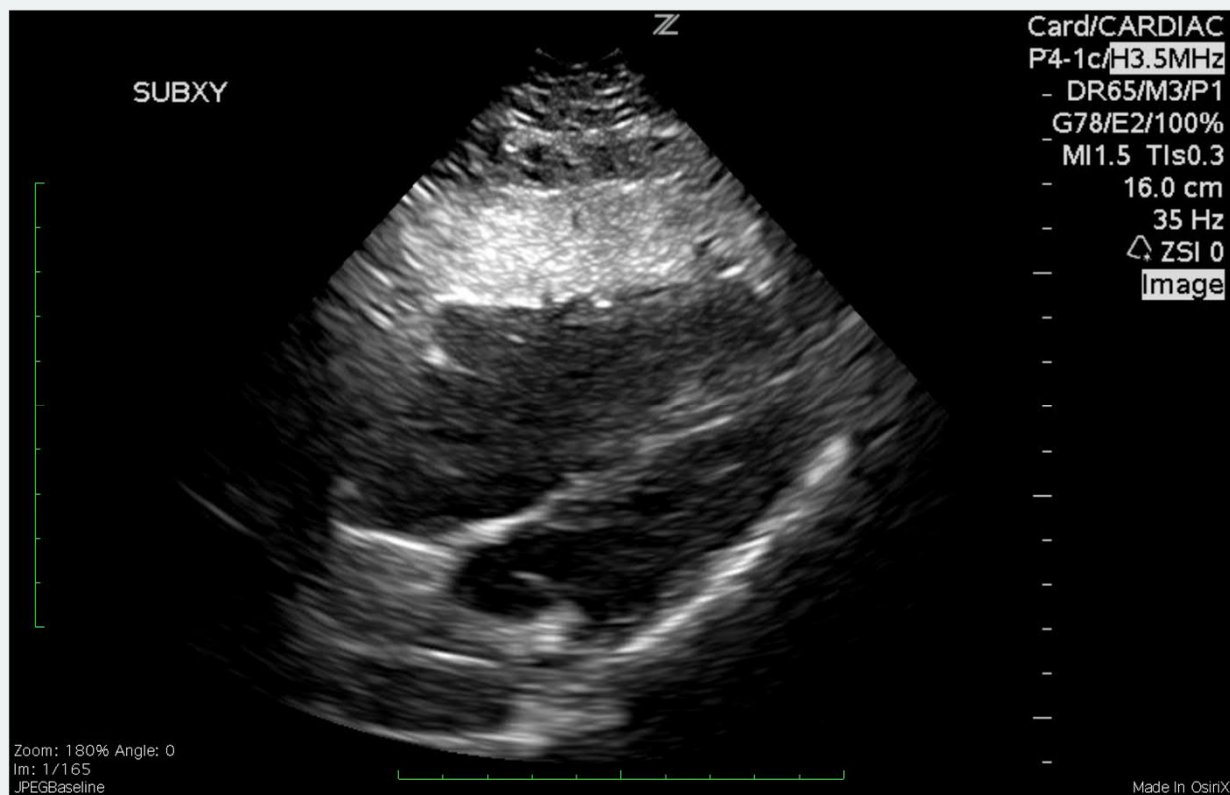
D-Sign

Right Ventricular Shape

Size: Right Ventricular Size

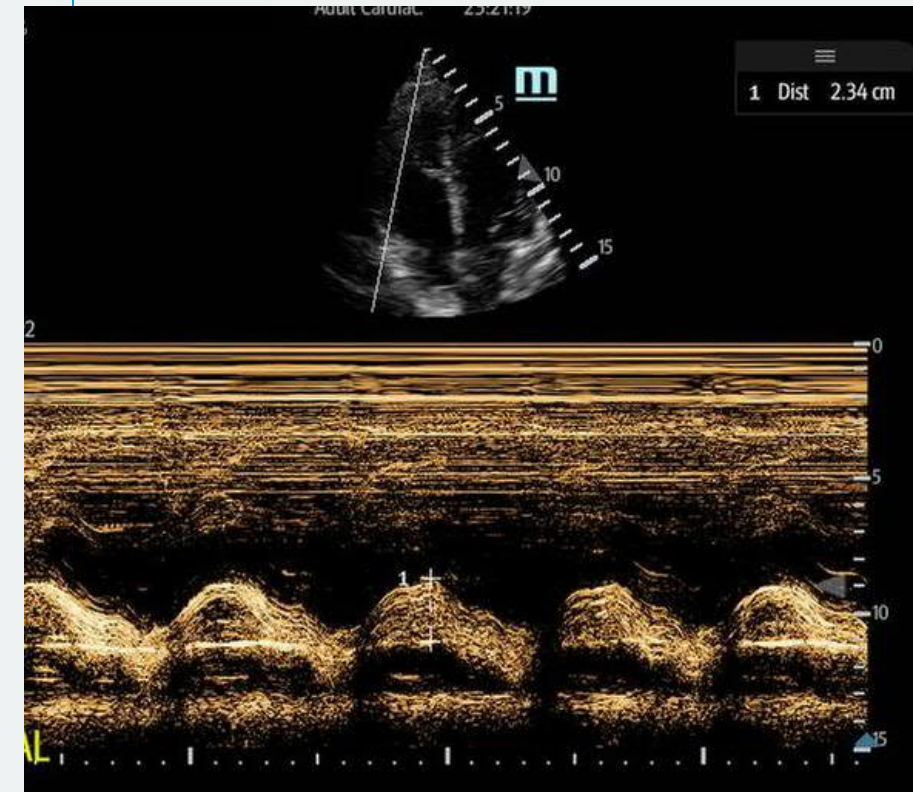
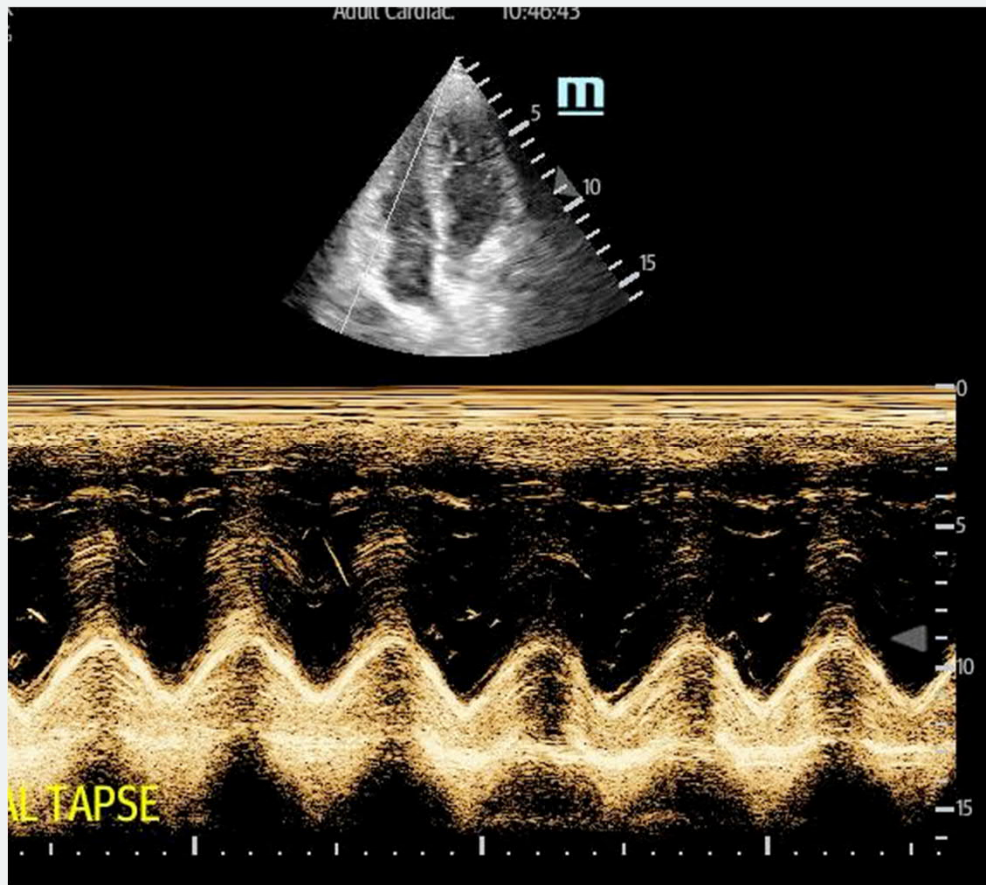


- Clot in transit:
Pulmonary Embolus



PE: McConnell's Sign

TAPSE: Tricuspid Annular Plane Systolic Excursion

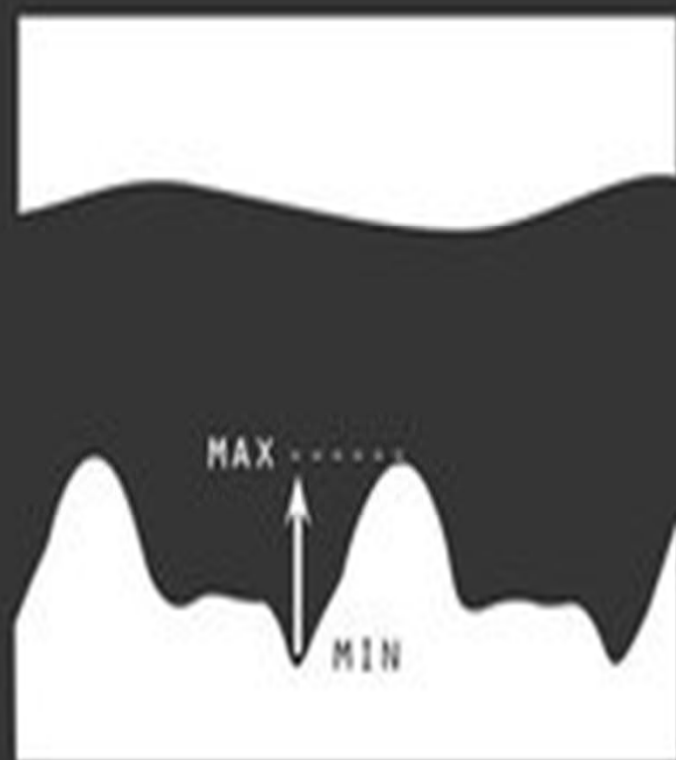


TRICUSPID ANNULAR PLANE SYSTOLIC EXCURSION

@ULTRASOUNDJELLY



APICAL 4 CHAMBER



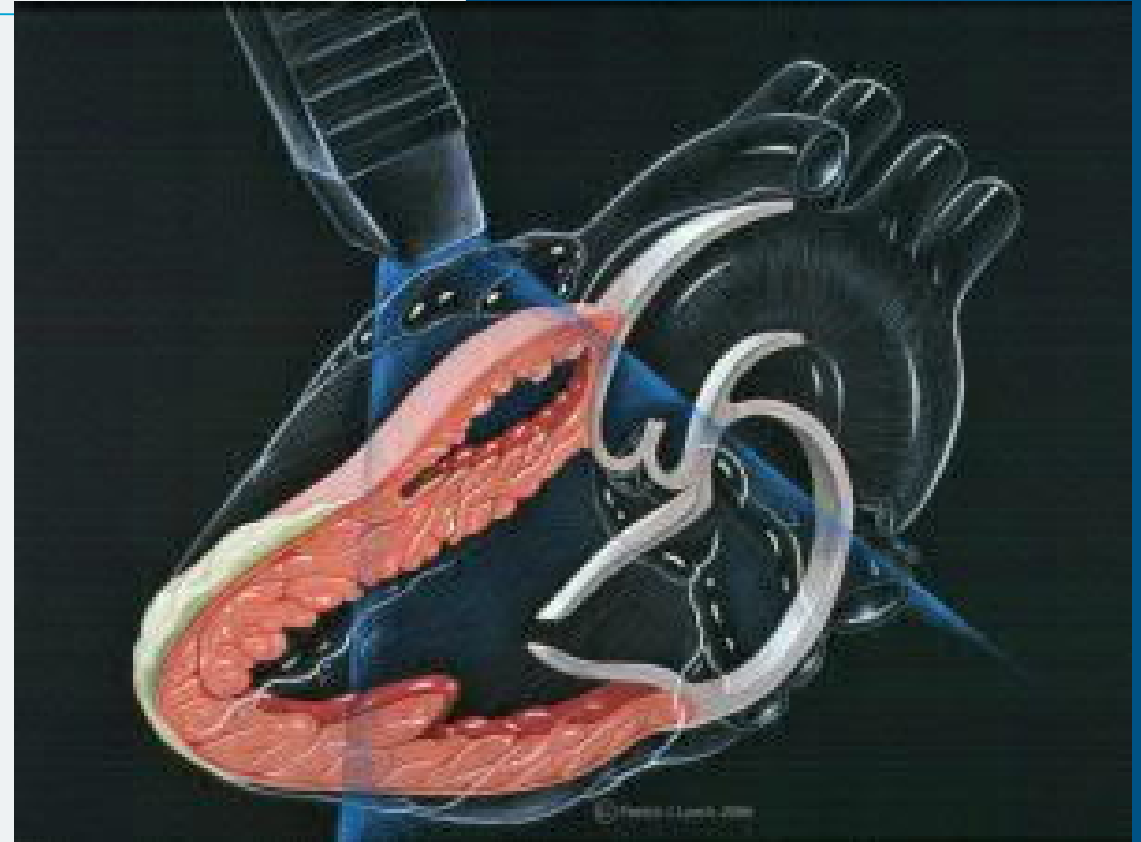
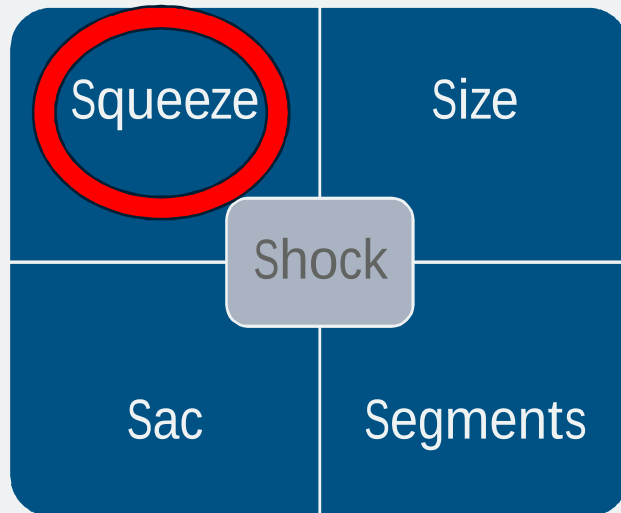
M-MODE



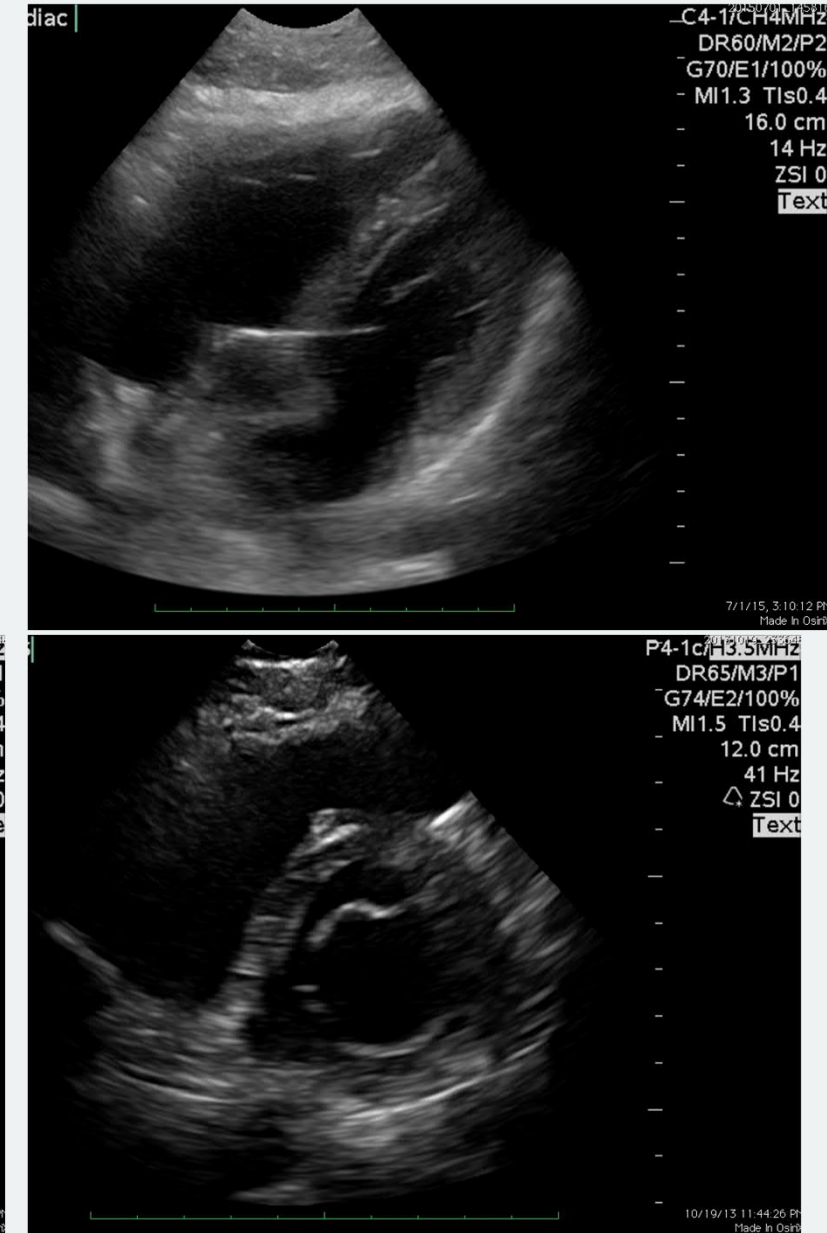
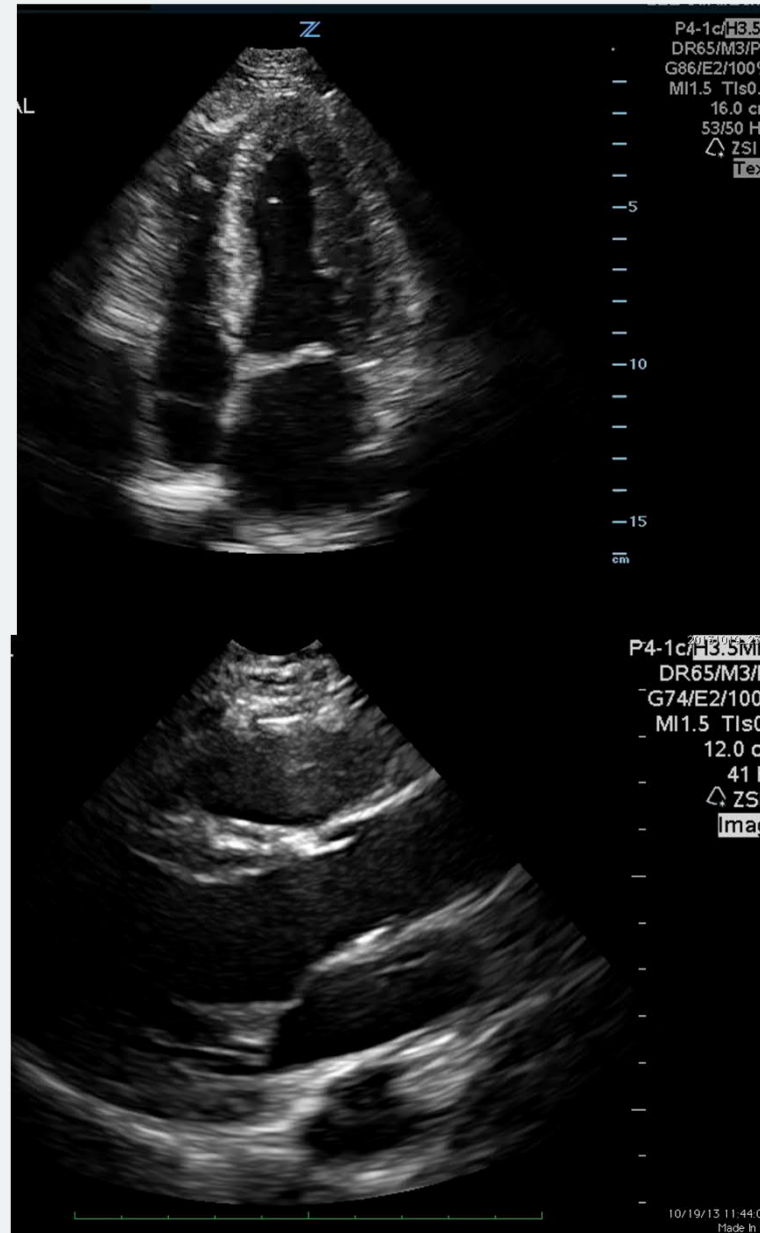
MEASURE TRICUSPID
ANNULAR EXCURSION

Case: The S's of Focused Echo

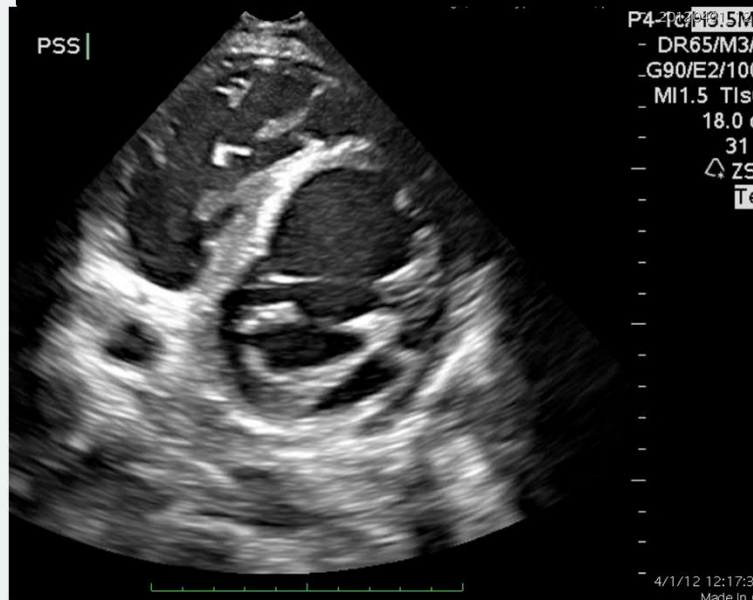
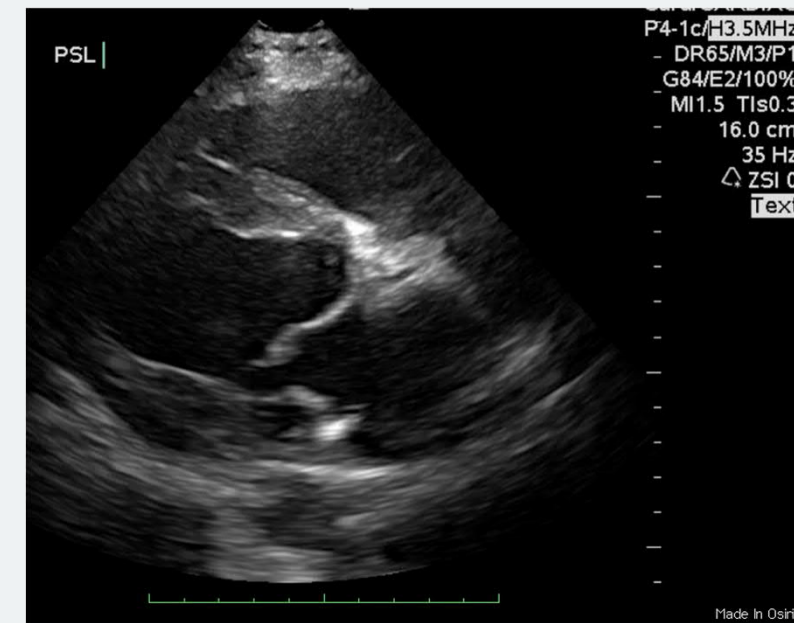
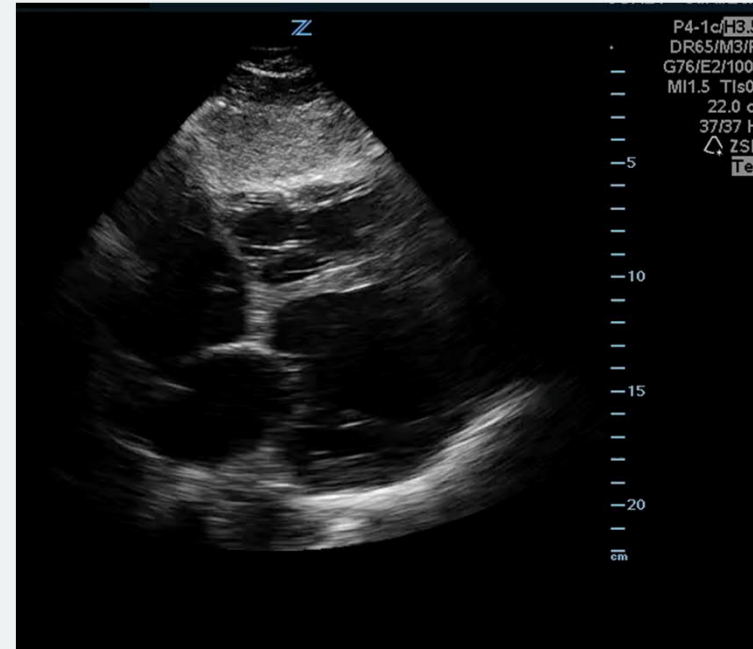
- 65 y/o patient with Pmhx CAD s/p stent, CHF (HFrEF) and recent cancer diagnosis presents with chest pain and SOB.



Squeeze: Normal Contractility

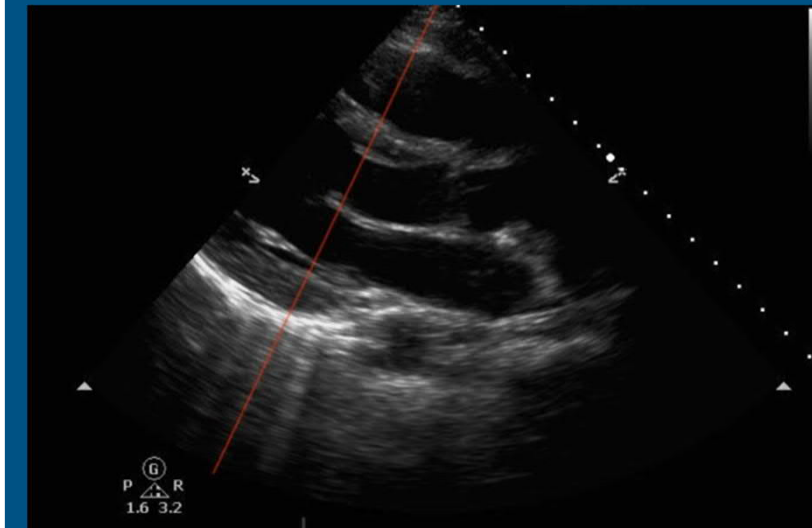
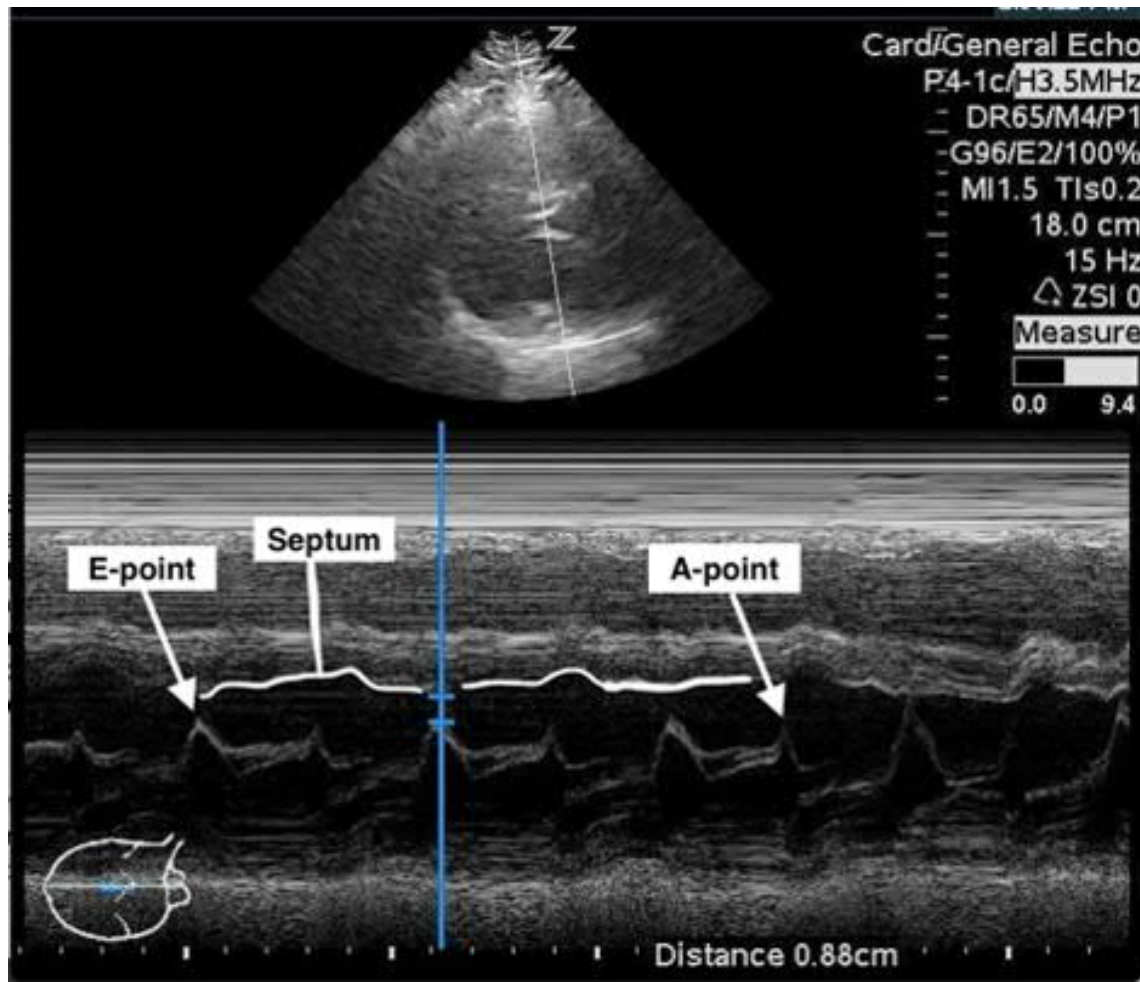


Severely Decreased Contractility



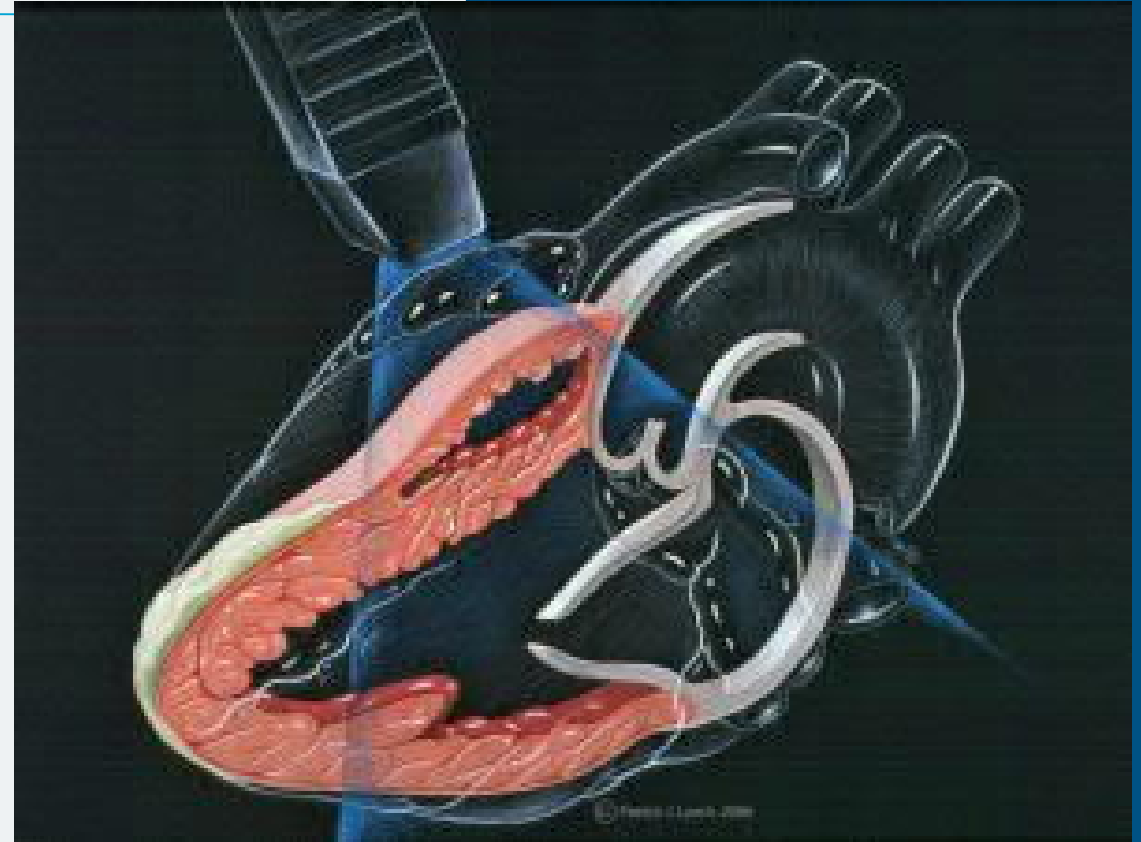
Contractility: EPSS

- E-Point Septal Separation (EPSS)



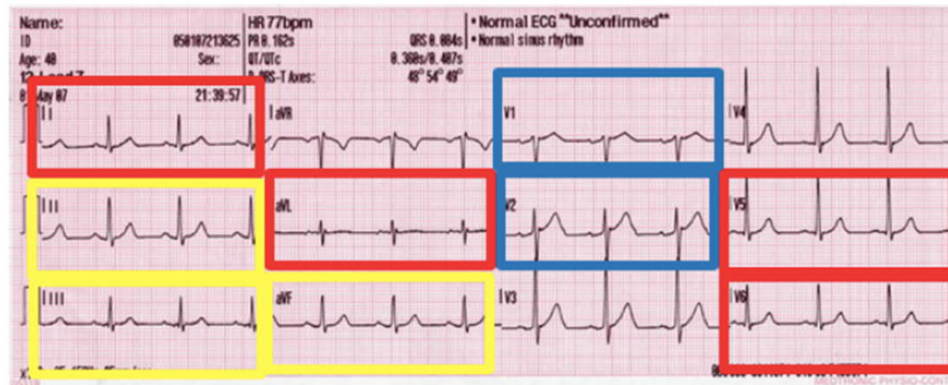
Case: The S's of Focused Echo

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Segments: Ischemia/Infarct

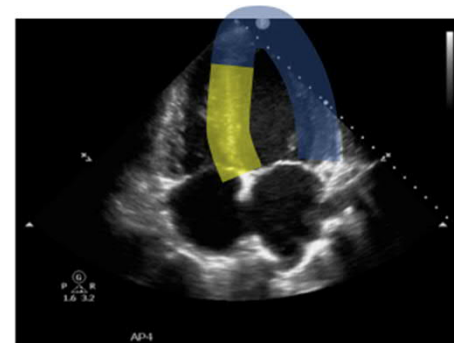
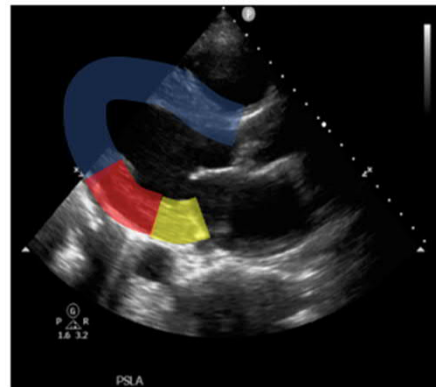
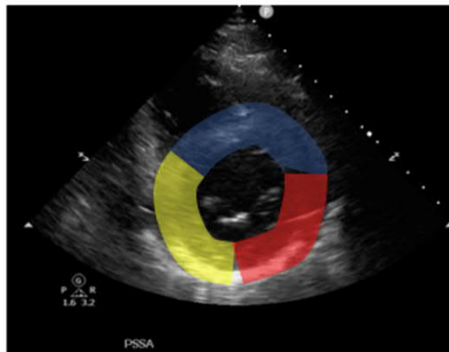
- Regional Wall Motion Abnormalities

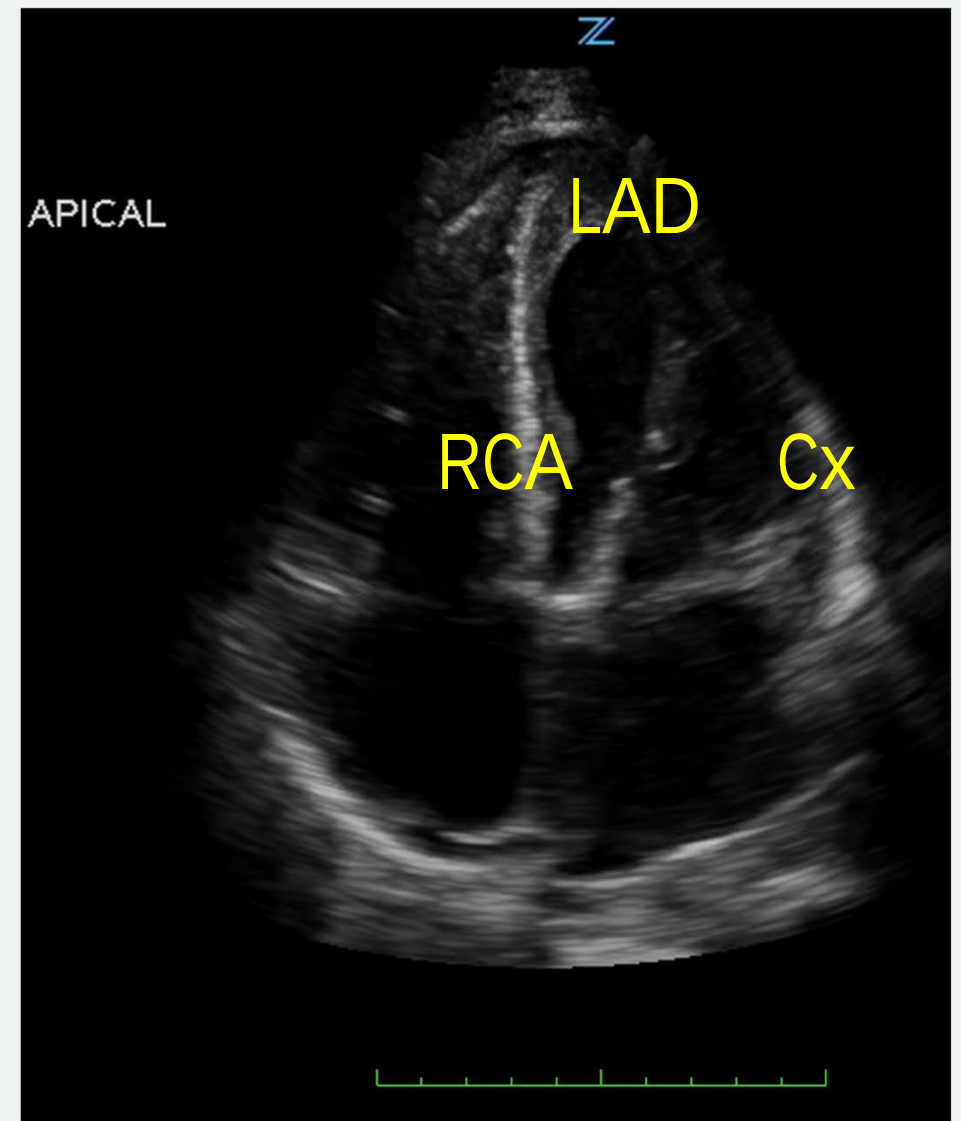
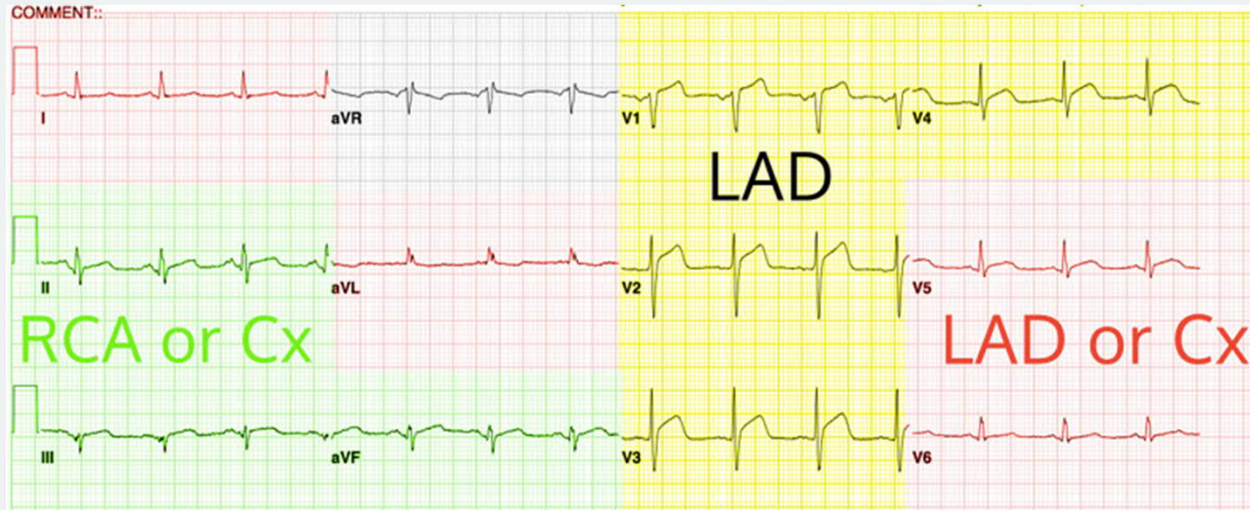


BLUE: Anterior = left anterior descending artery

YELLOW: Inferior = right coronary artery

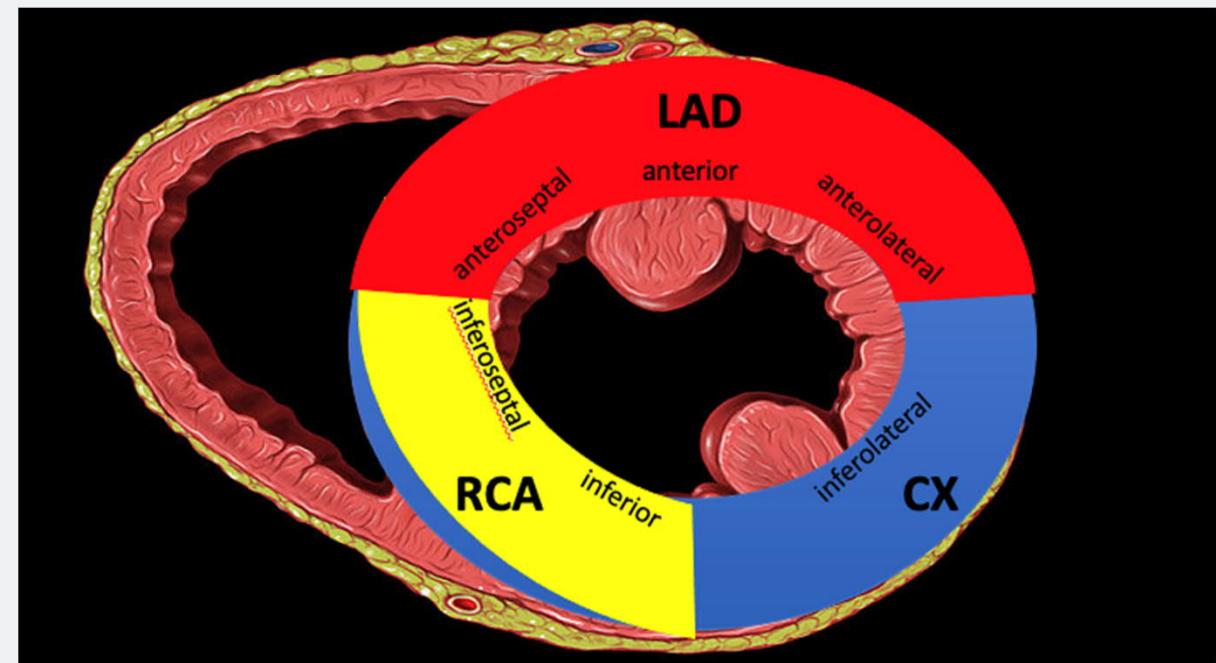
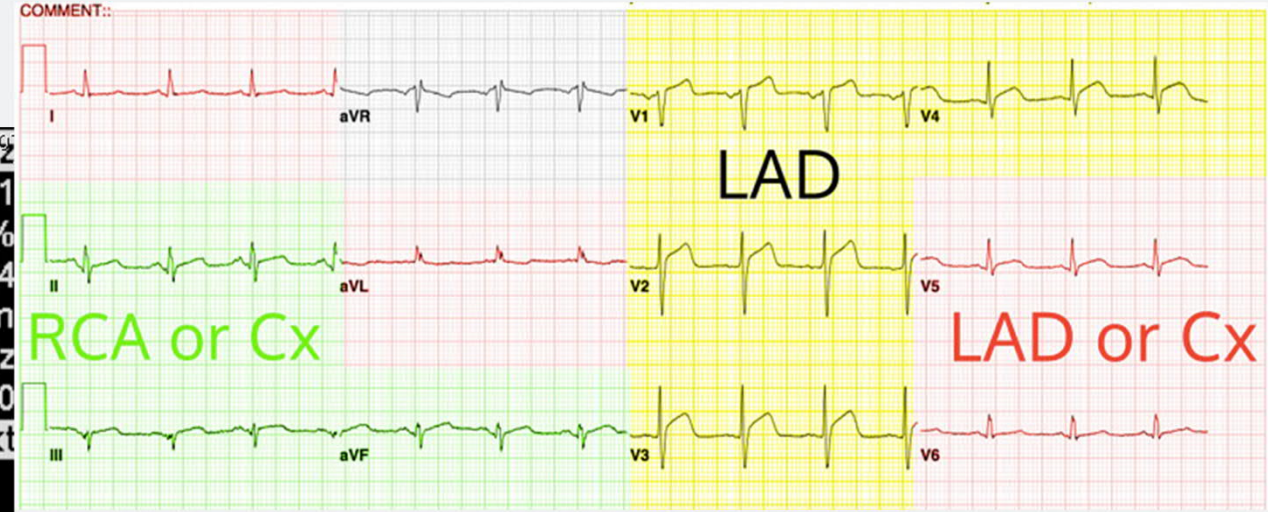
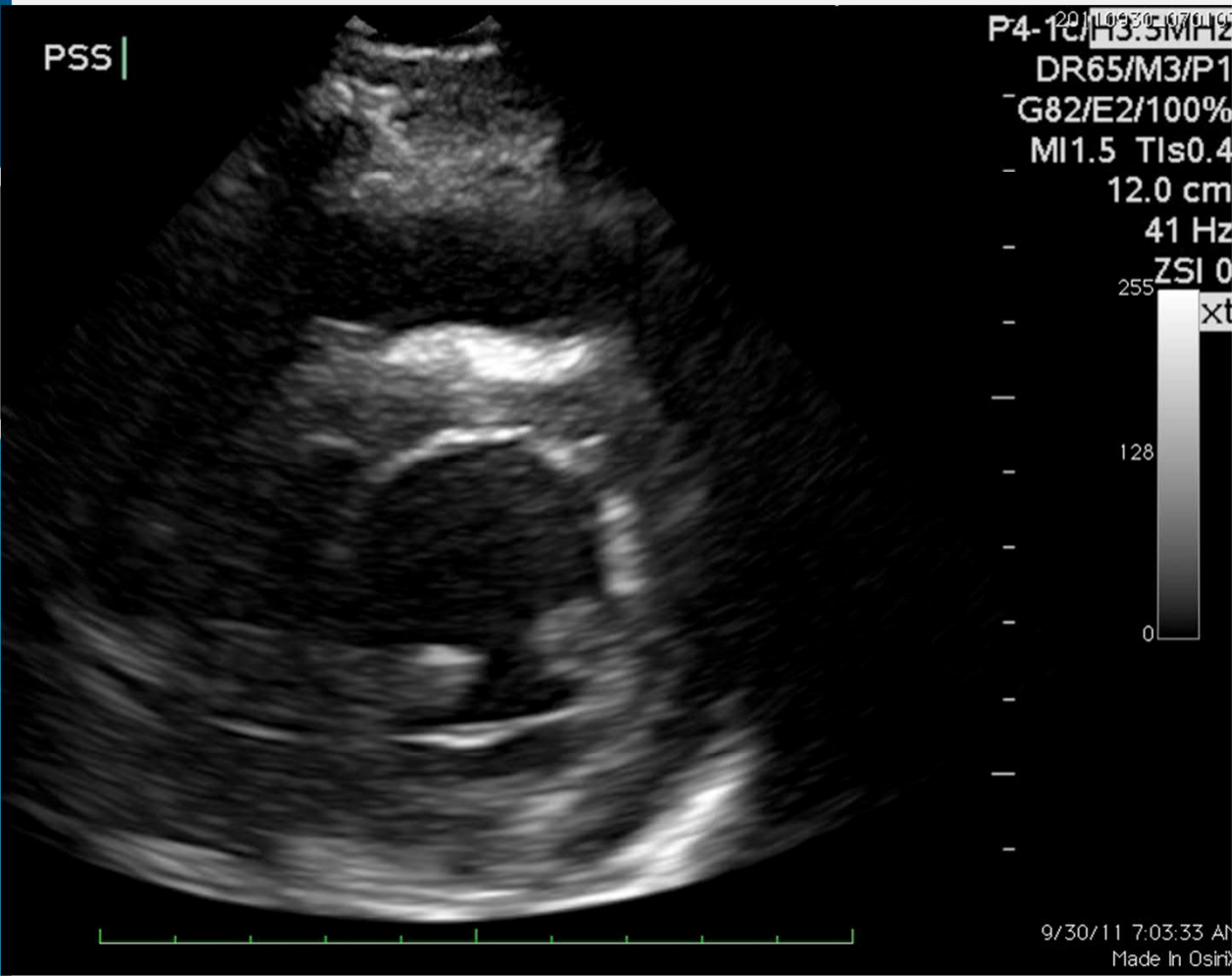
RED: Lateral = left circumflex artery



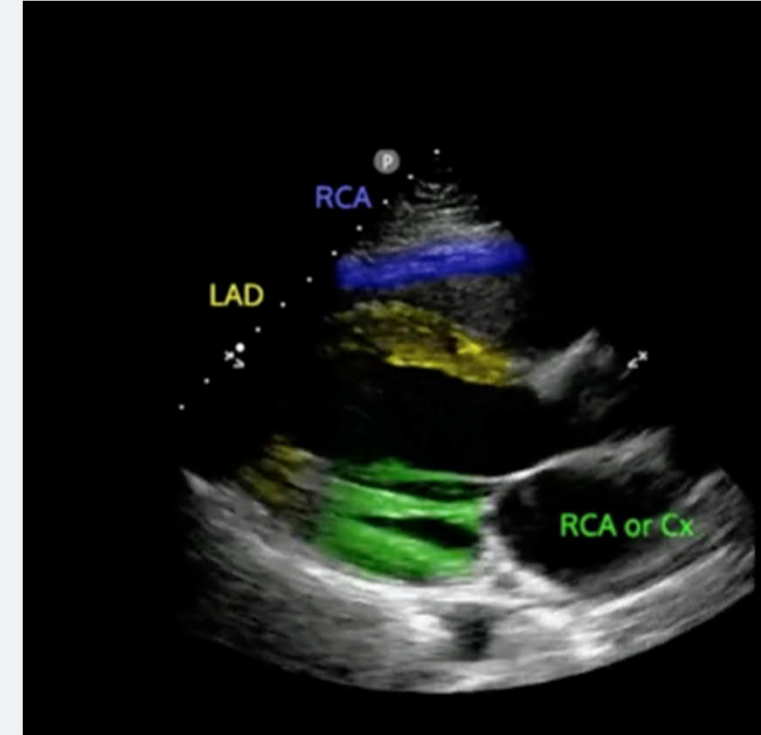
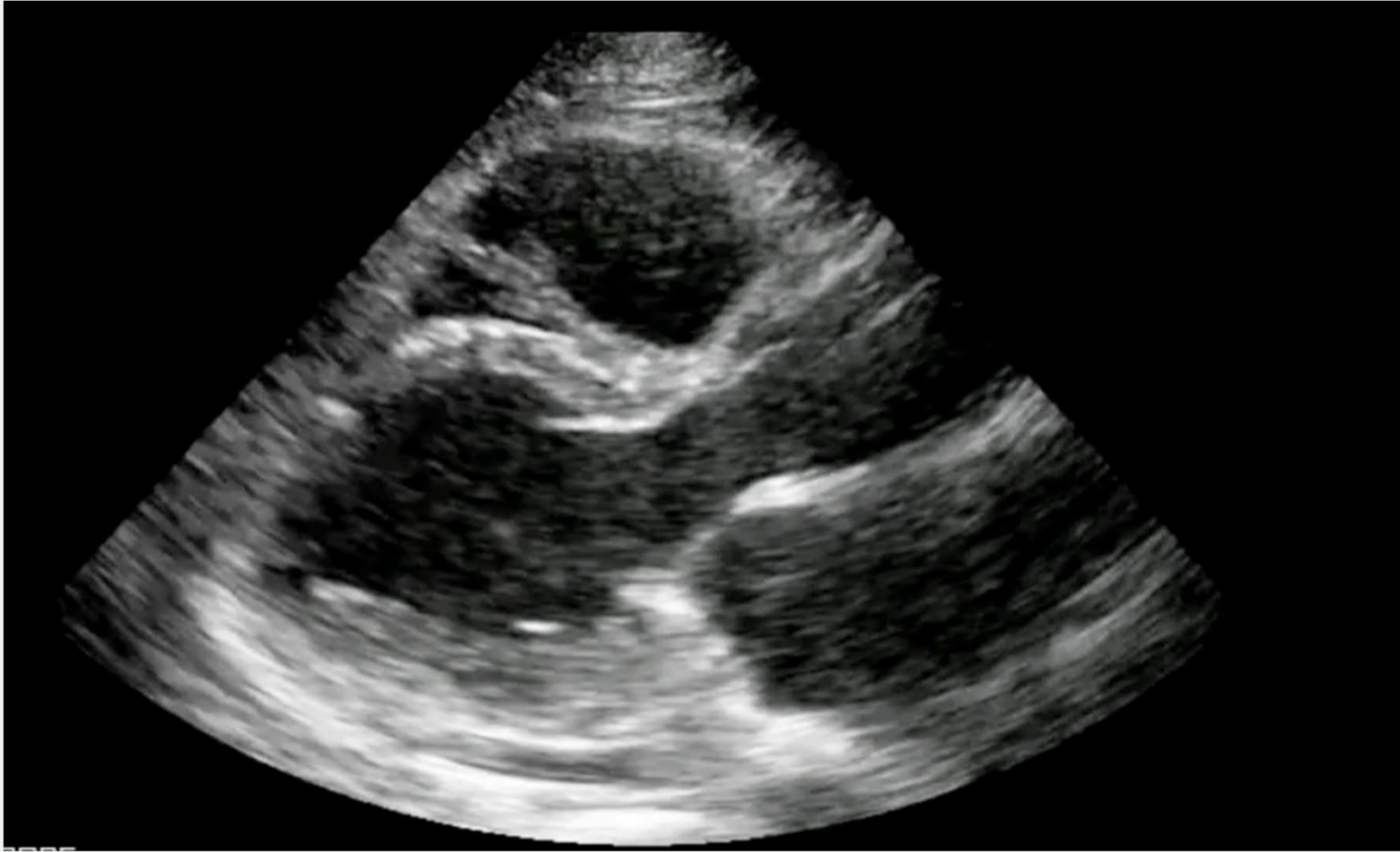


Apical View





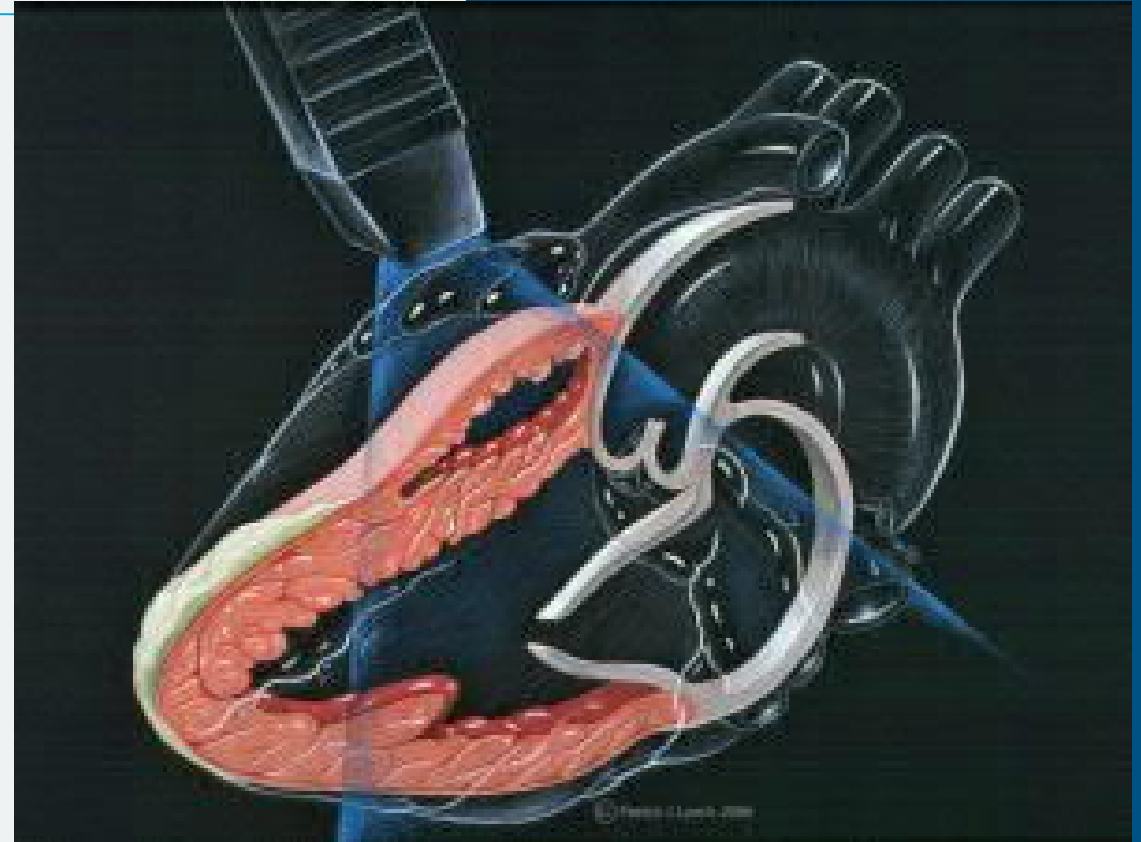
Parasternal Short View



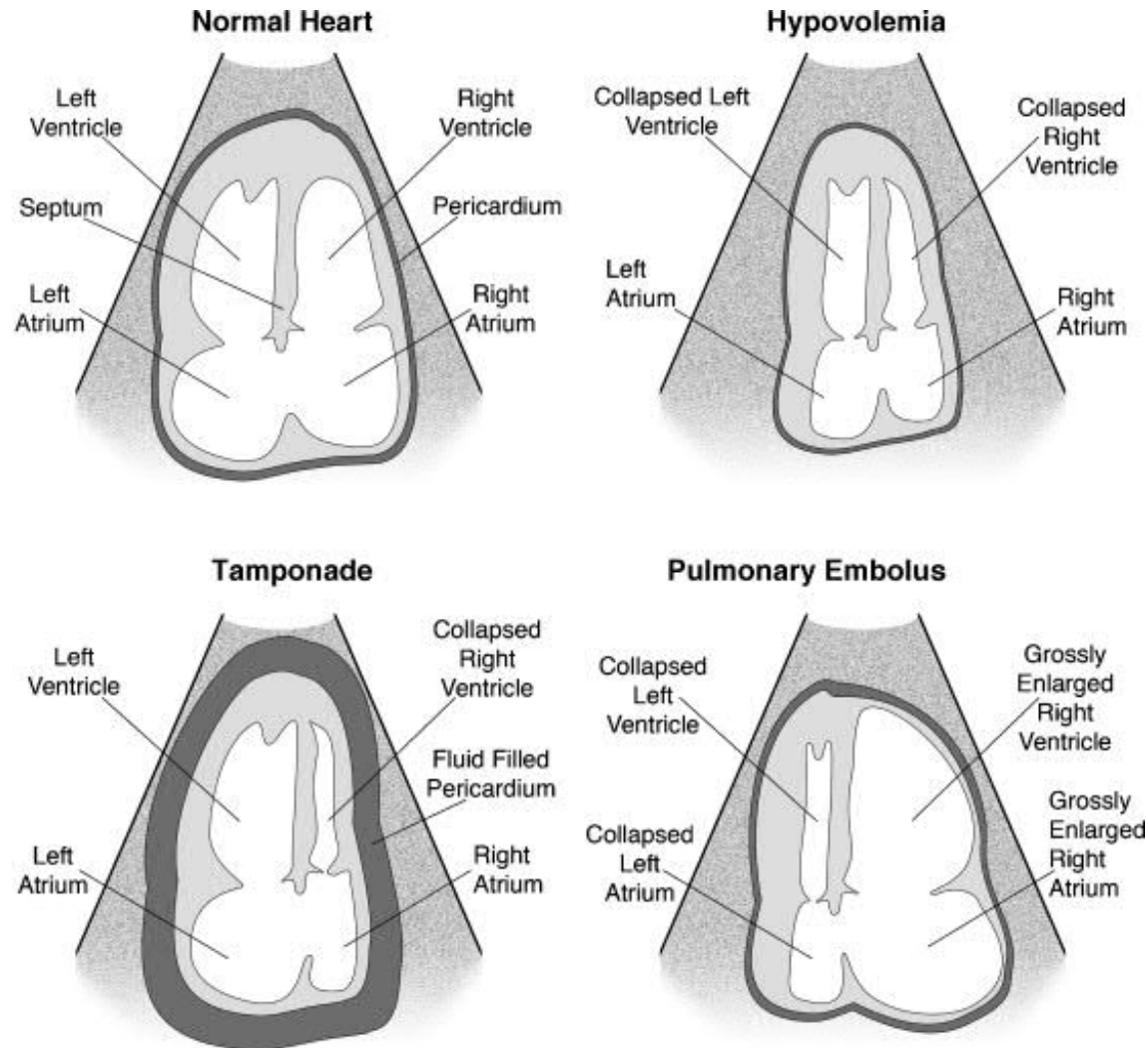
Where is the lesion?
Most likely LAD distribution

Case: The S's of Focused Echo

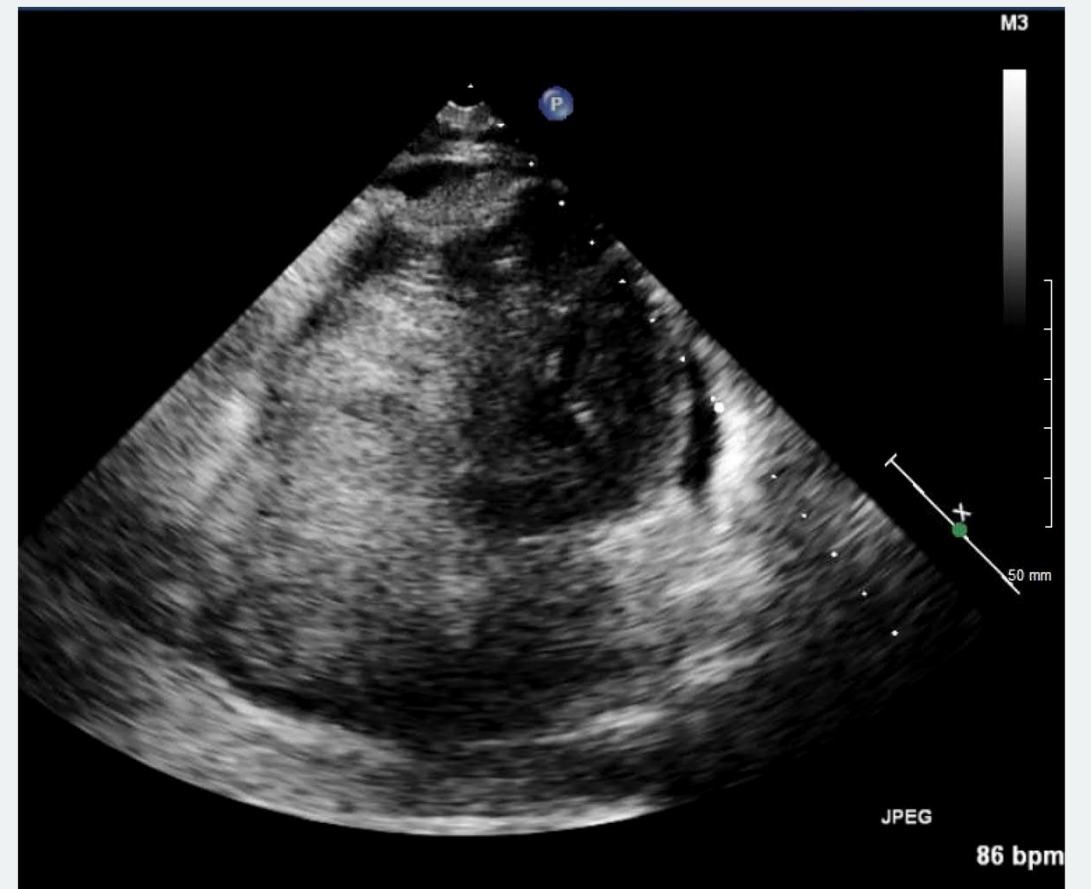
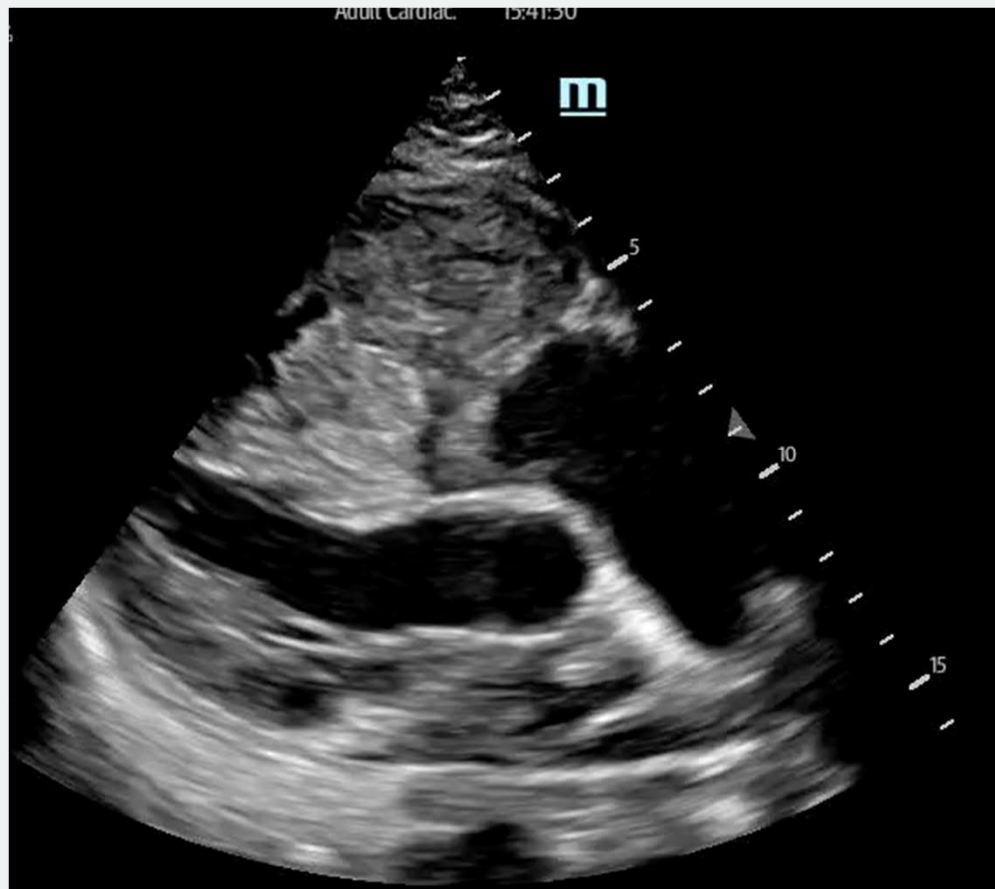
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Putting it all together: Shock

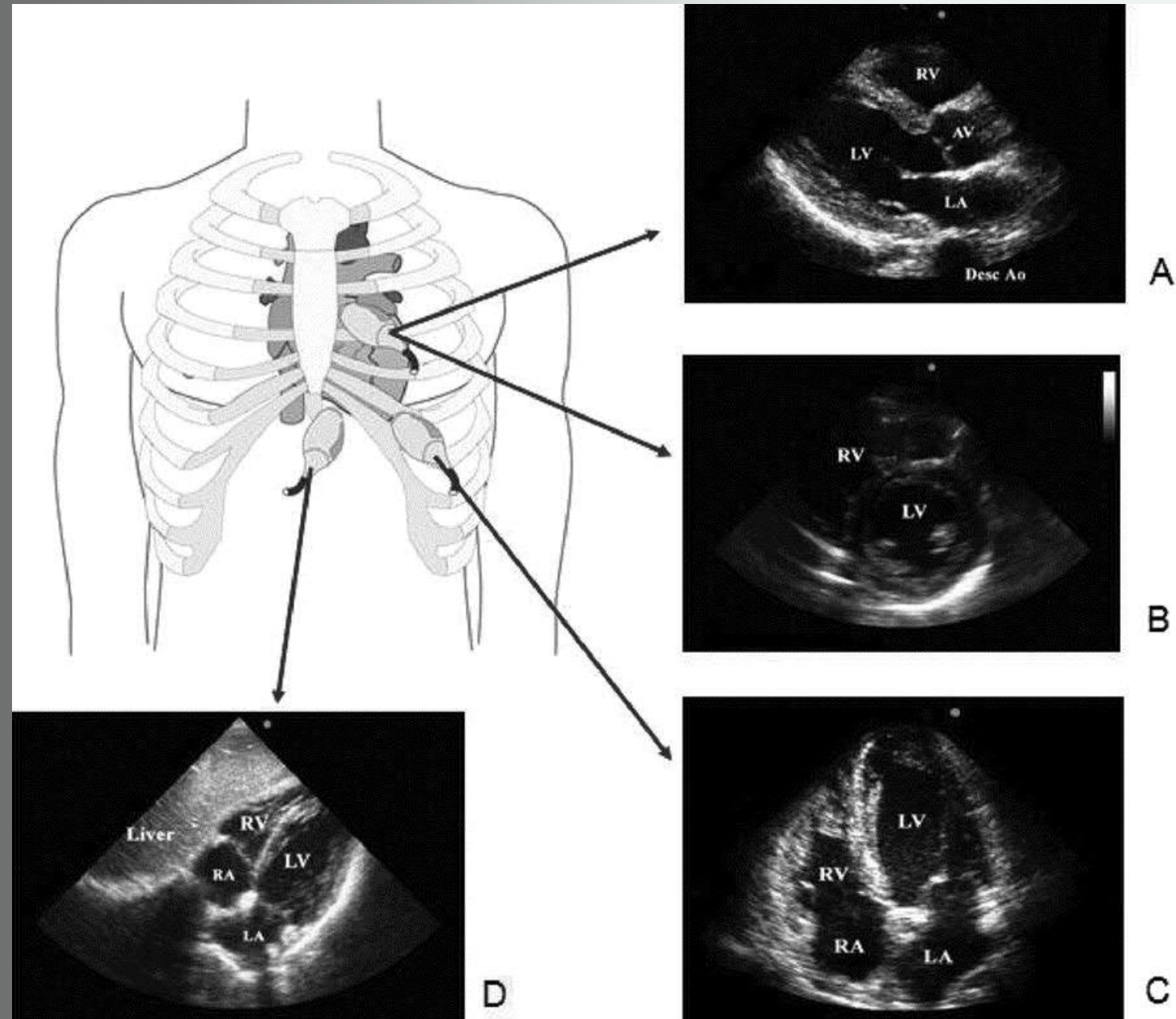


Cardiac Masses



Review

- Main focused POCUS cardiac views
 - Apical
 - Subxiphoid
 - Parasternal Long
 - Parasternal Short
 - IVC
- The S's of Focused Echo
- Clinical Scenarios



Questions?

References

- **A Case Report of Cardiac Tamponade** Derek JC Hunt, DO*, Kevin McLendon, DO* and Matthew Wiggins, MD* DOI: <https://doi.org/10.21980/J8J644>
- Advanced Critical Care Ultrasound: Augmenting the Physical Exam with Ultrasound Findings in Cardiac Tamponade 10/5/2021 [Taylor Miller, MD](#), [Alexis Salerno, MD, FACEP](#), [Dustin Slagle, MD](#); <https://www.emra.org/emresident/article/us-cardiac-tamponade>
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