

Internal Medicine Point-of-Care Ultrasound: Parasternal, Subxiphoid, Apical

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Disclosure

- No financial disclosure or conflicts of interest with the presented material in this presentation.

PEARLS



P – Parasternal (and subxiphoid)

E - Epigastric

A - Anterior lung; apical (cardiac)

R - RUQ

L - LUQ

S - Suprapubic

Lecture Outline

- Discuss beginner and advanced goals with POCUS
- Probe Orientation
- Normal Ultrasound Anatomy
- Pathology and Applications for the internist

Parasternal and Apical Views

- Beginner
 - Identify all anatomical structures one should have in your “home screen.”
 - Identify the descending aorta.
 - Identify pericardial effusions.
 - Determine big picture left ventricular function.
 - Evaluate chamber size and wall motion.
- Advanced
 - Identify probable etiology of a murmur.
 - Visualization of tricuspid valve and right atrial pathology.
 - Evaluate RV strain.

Probe Orientation in Parasternal Long Axis View

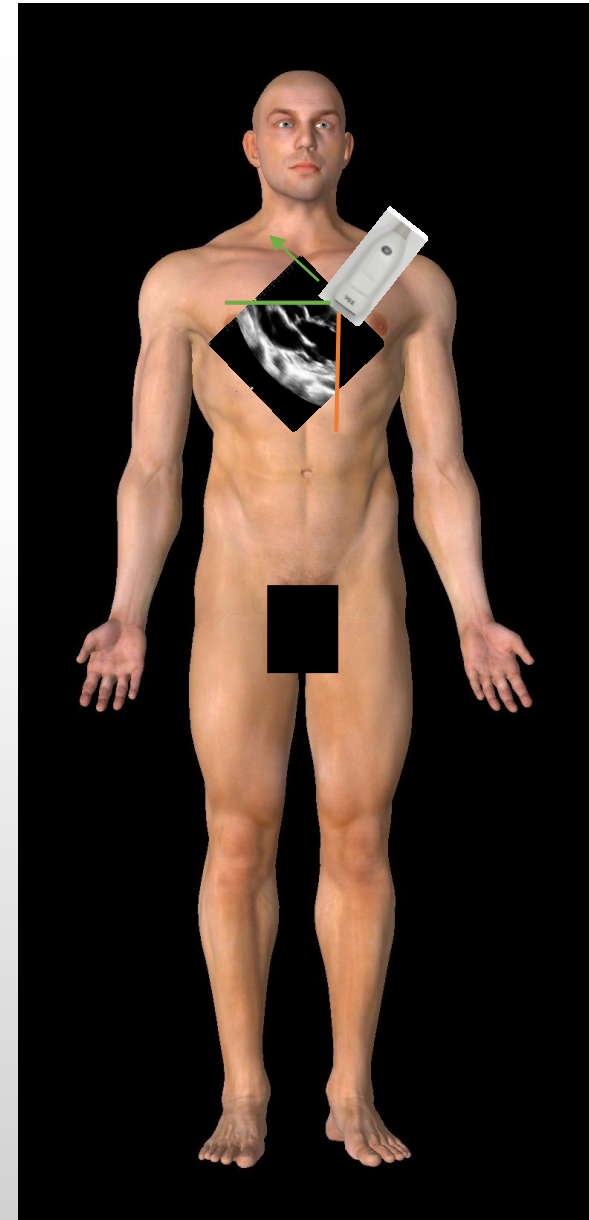
Probe: Phased Array/ sector probe

Preset: Cardiac

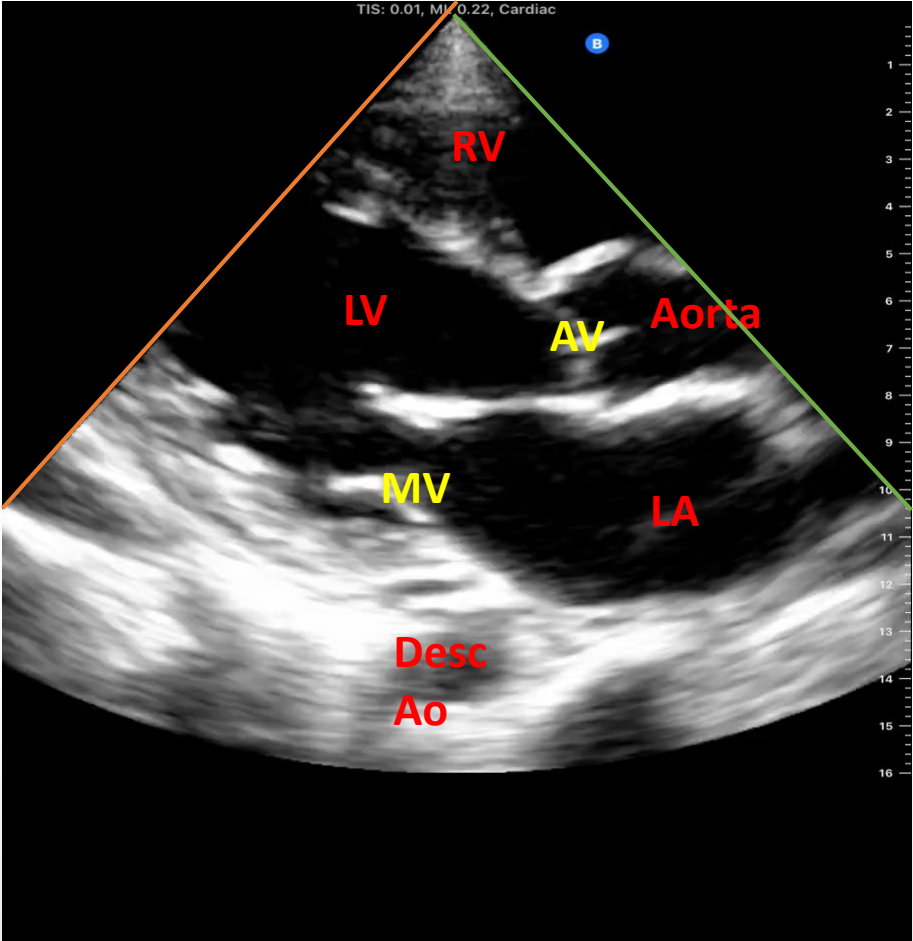
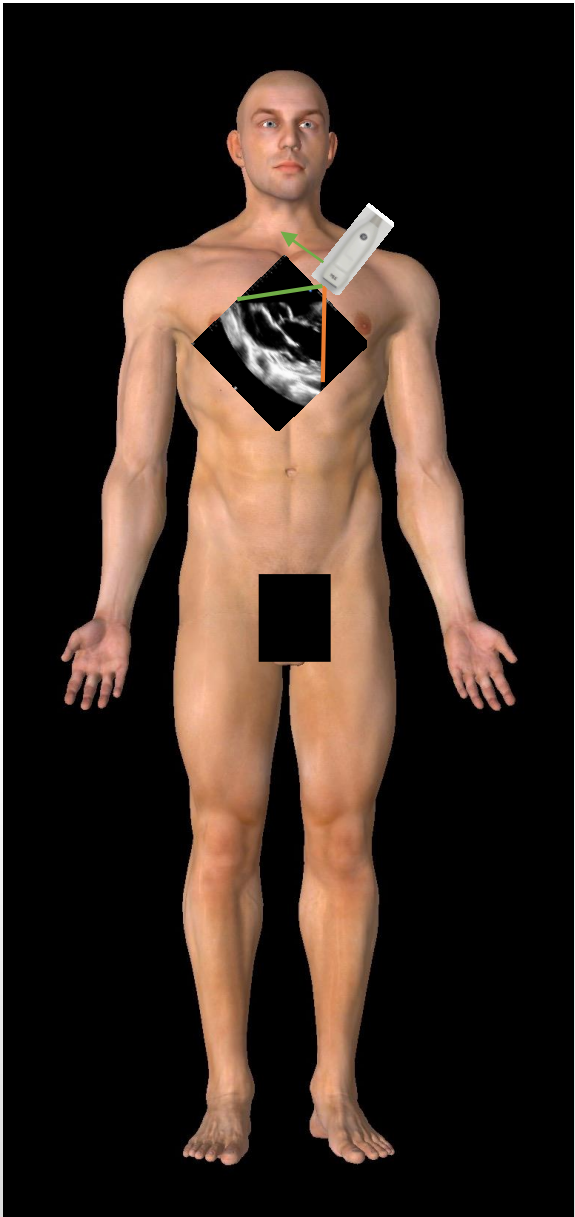
Probe marker: Patient's right shoulder

Probe location: Approximately left 4th intercostal space

- Window shopping



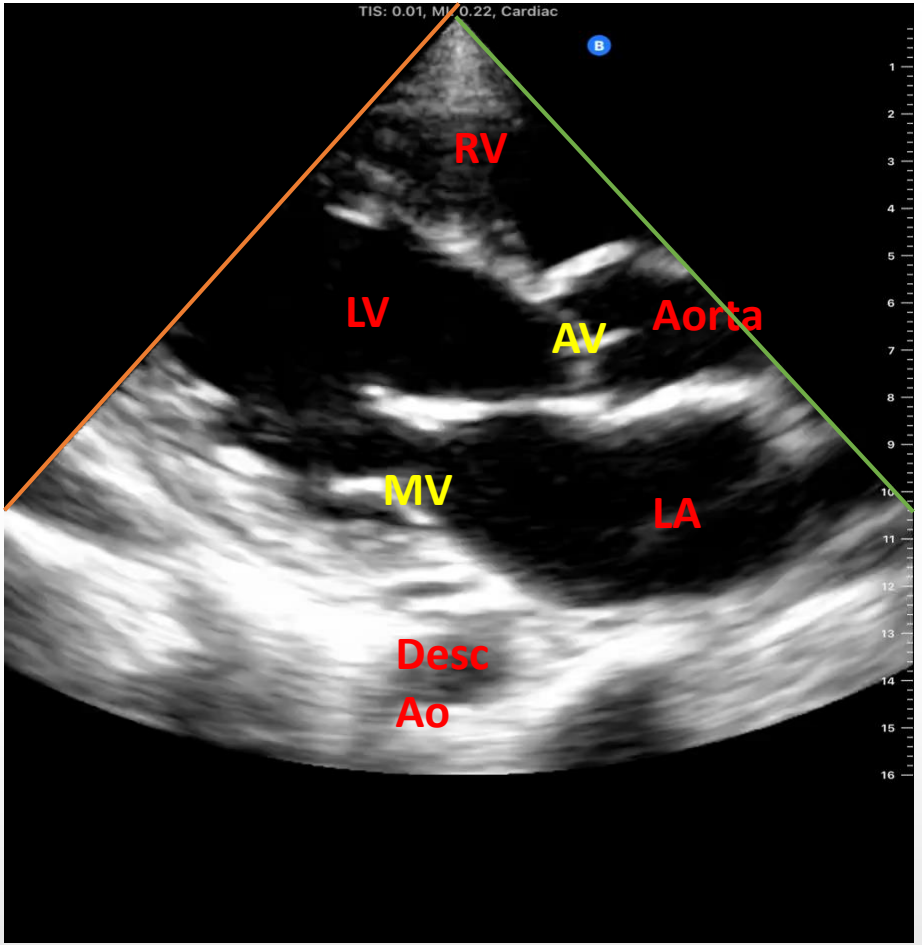
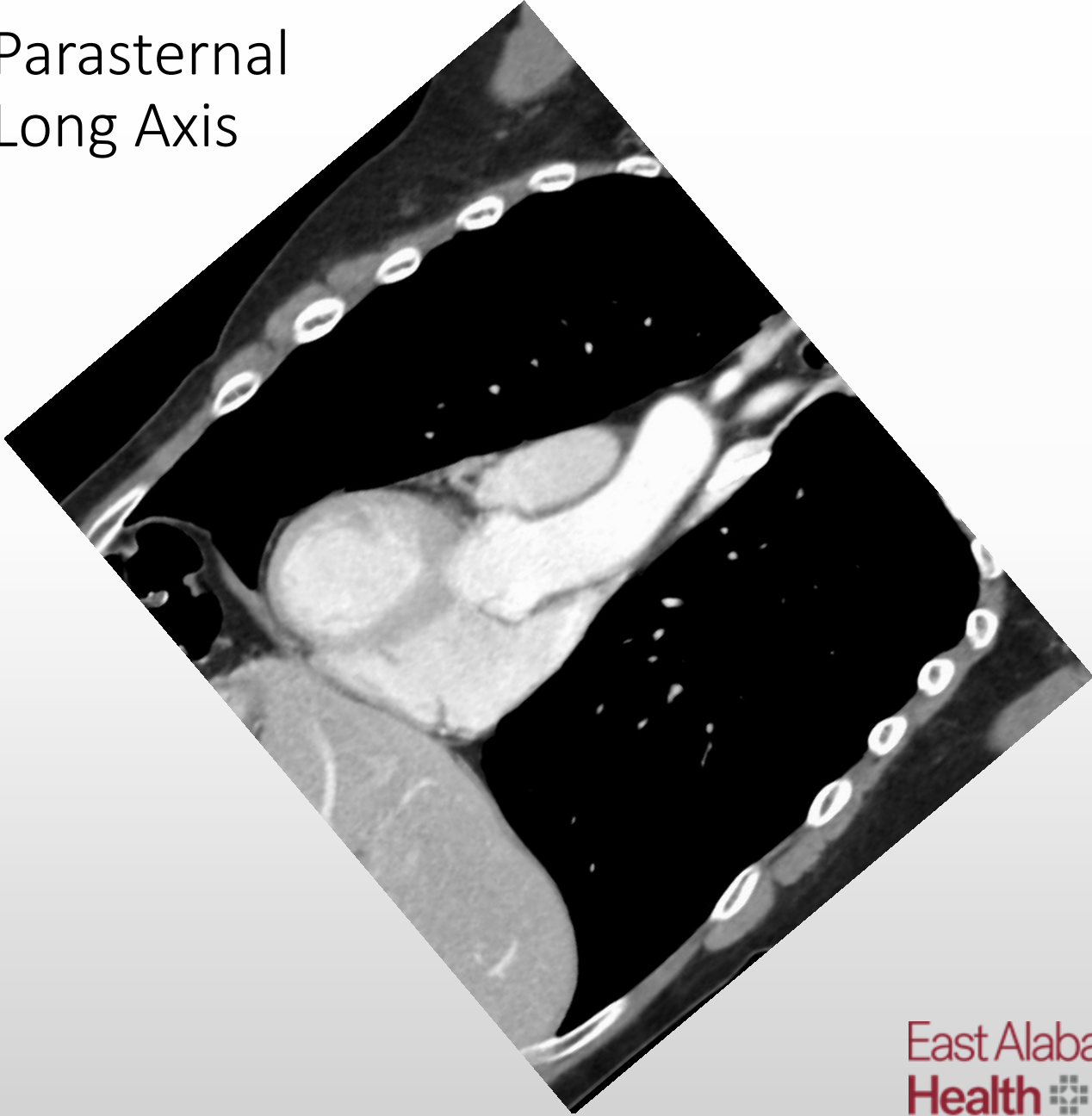
Parasternal Long Axis



Important considerations:

- Rule of Thirds
- End Point Septal Separation (EPSS)

Parasternal
Long Axis



- Important considerations:
- Rule of Thirds
 - End Point Septal Separation (EPSS)

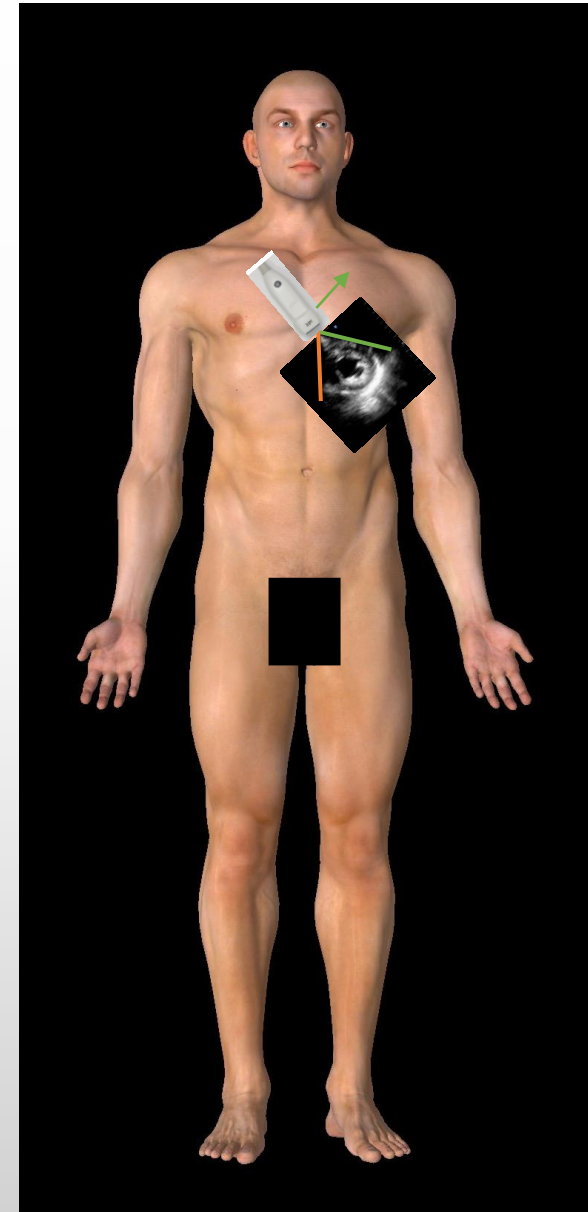
Probe Orientation in Parasternal Short Axis View

Probe: Phased Array

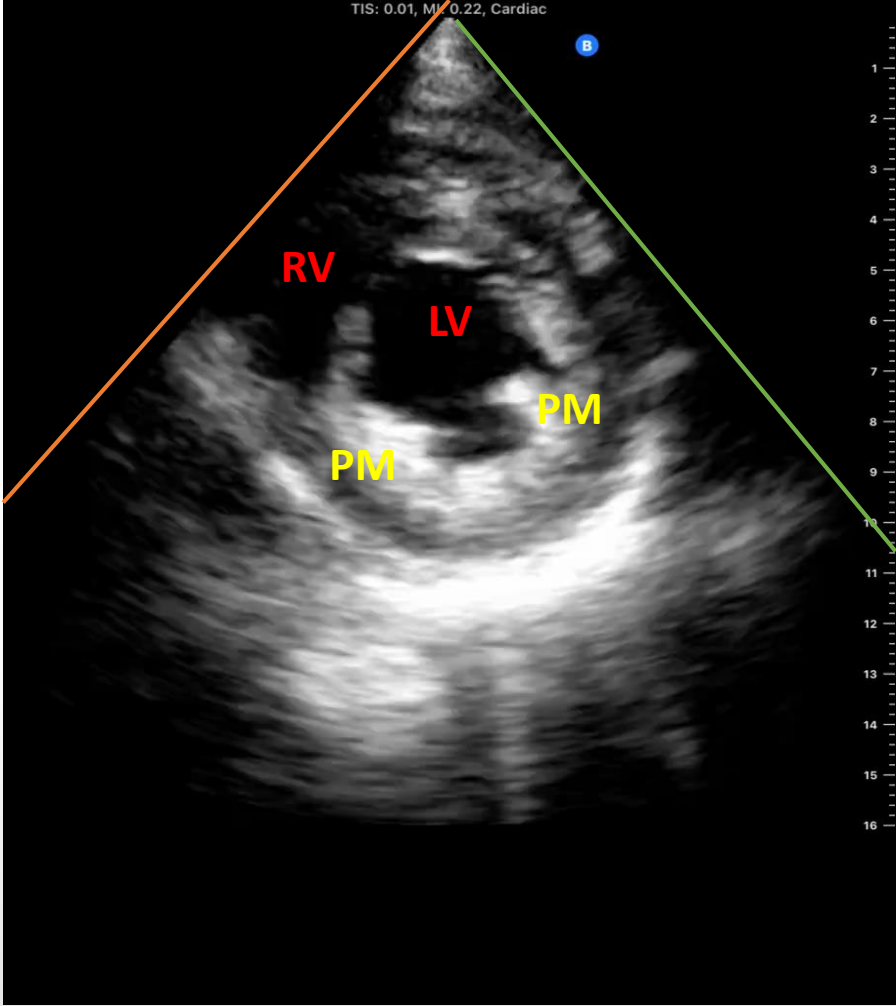
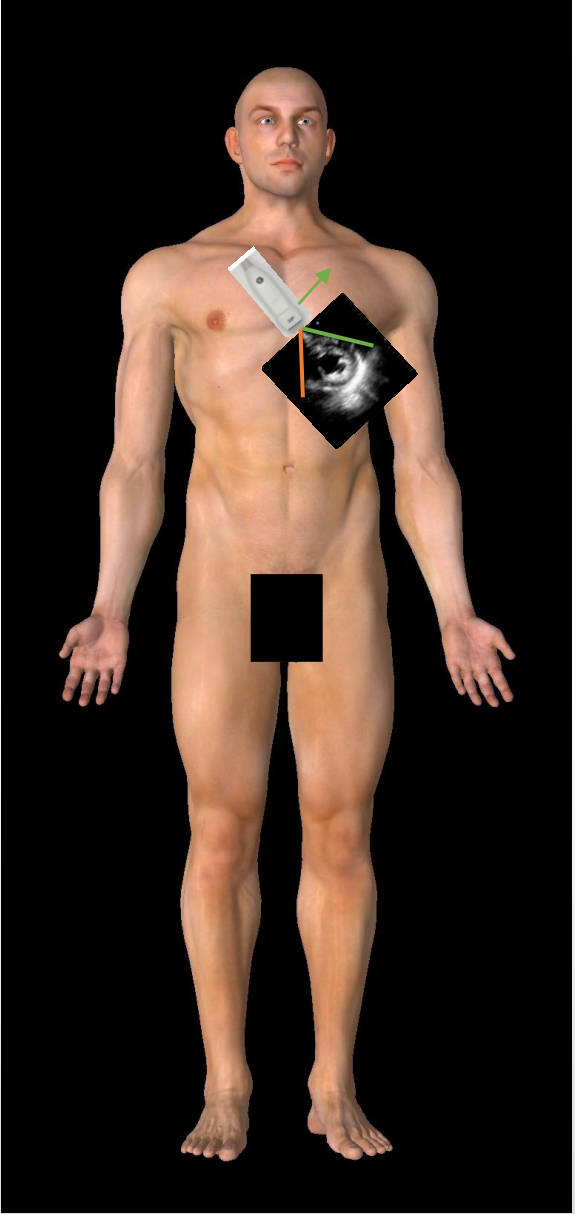
Preset: Cardiac

Probe marker: Patient's left shoulder

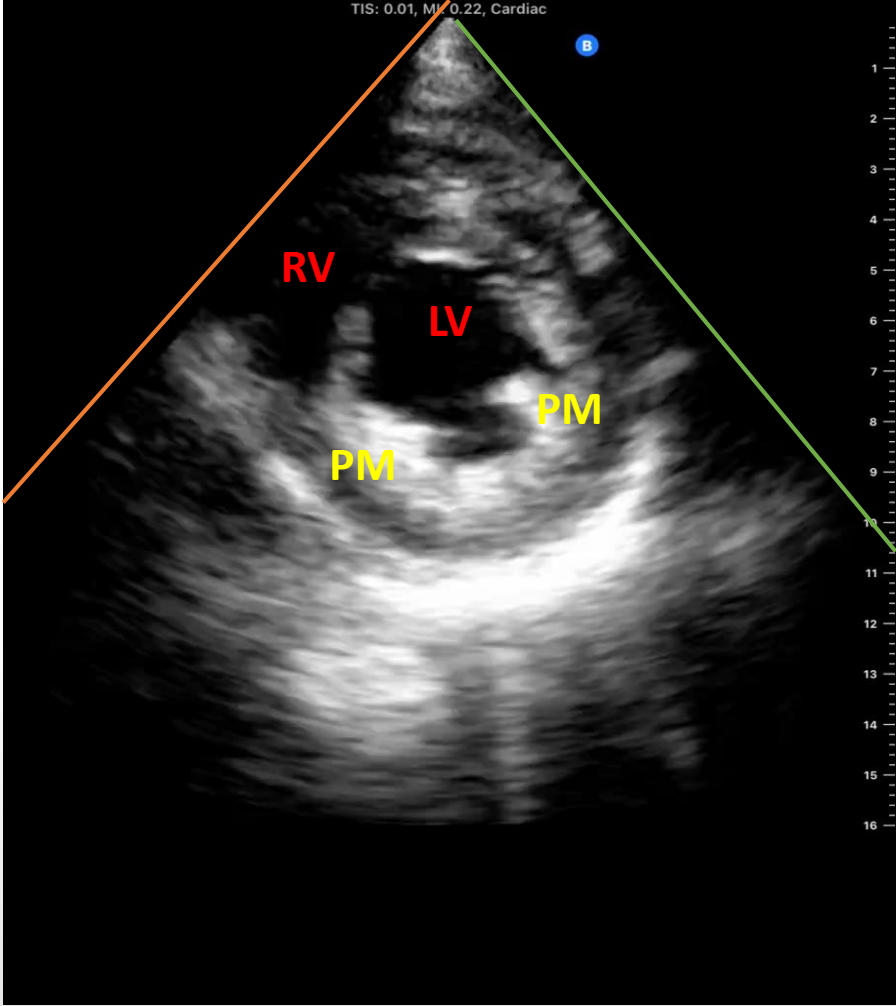
Probe location: Approximately left 4th intercostal space (where best PLAX view is obtained), 90 degrees turn from the parasternal long axis view



Parasternal Short Axis



Parasternal Short Axis



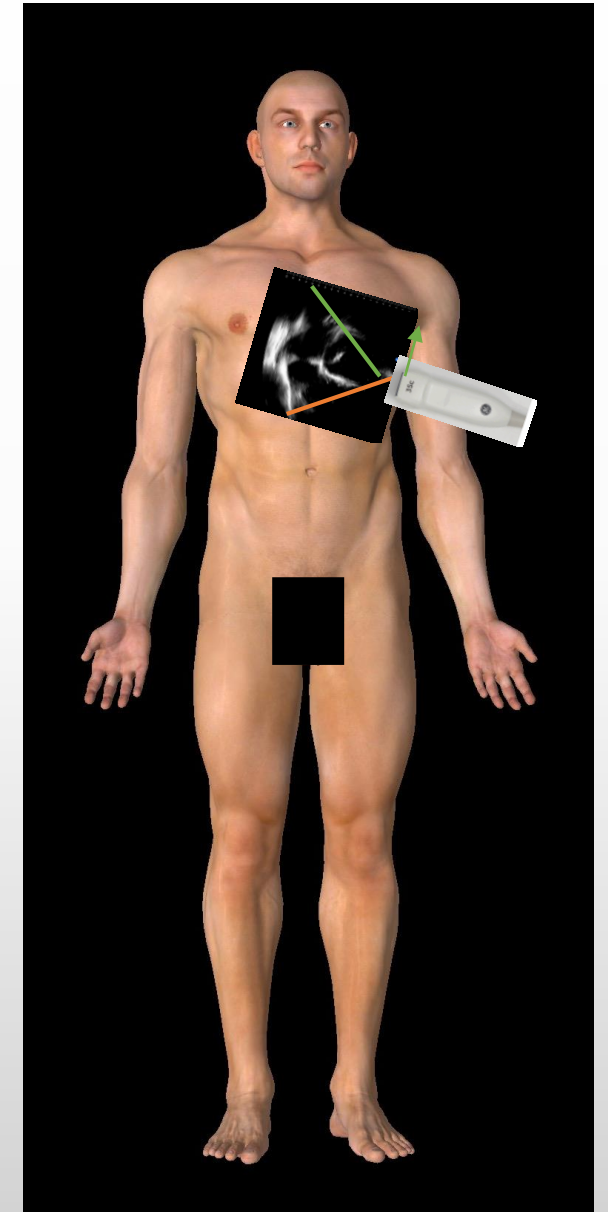
Probe Orientation in Apical View

Probe: Phased Array

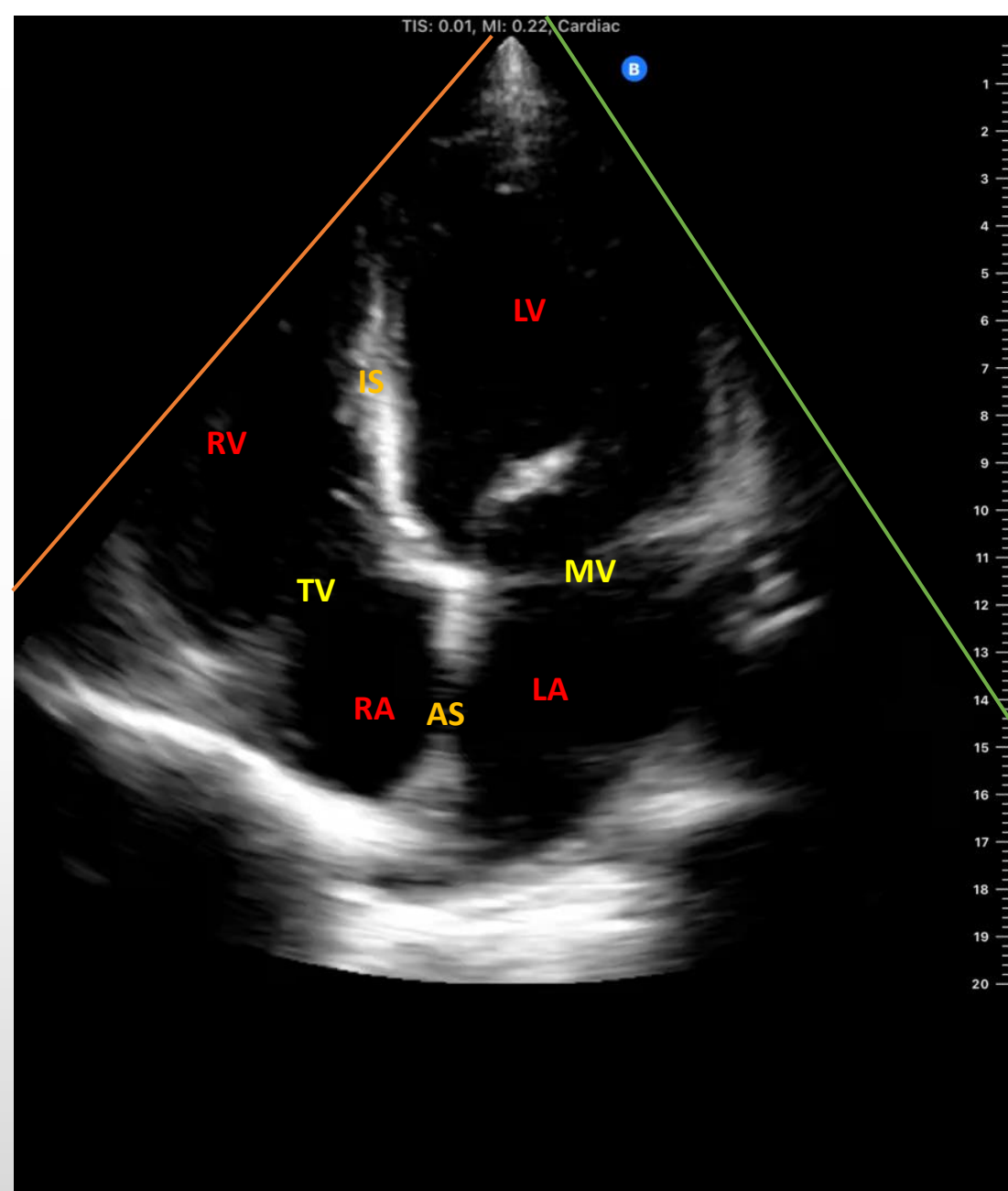
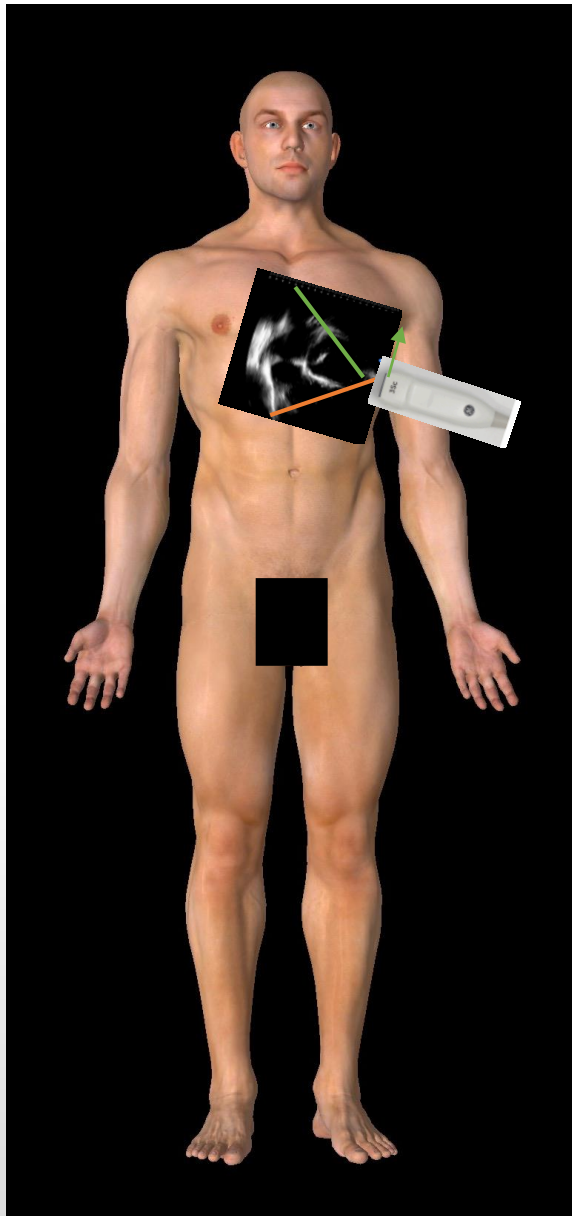
Preset: Cardiac

Probe marker: Patient's left

Probe location: between fourth or fifth ICS, midclavicular line
(have patient lie on left side to obtain better view)



Apical



Subxiphoid View

- Beginner
 - Identify all the anatomical structures on should have on your “home screen”.
 - All four chambers, mitral, and tricuspid valve.
 - Identify pericardial effusions.
- Advanced
 - Obtain a “modified view” ... Obtain a short-axis and long-axis views of the heart by turning the probe marker to the ceiling and toward the patient’s right shoulder, respectively.

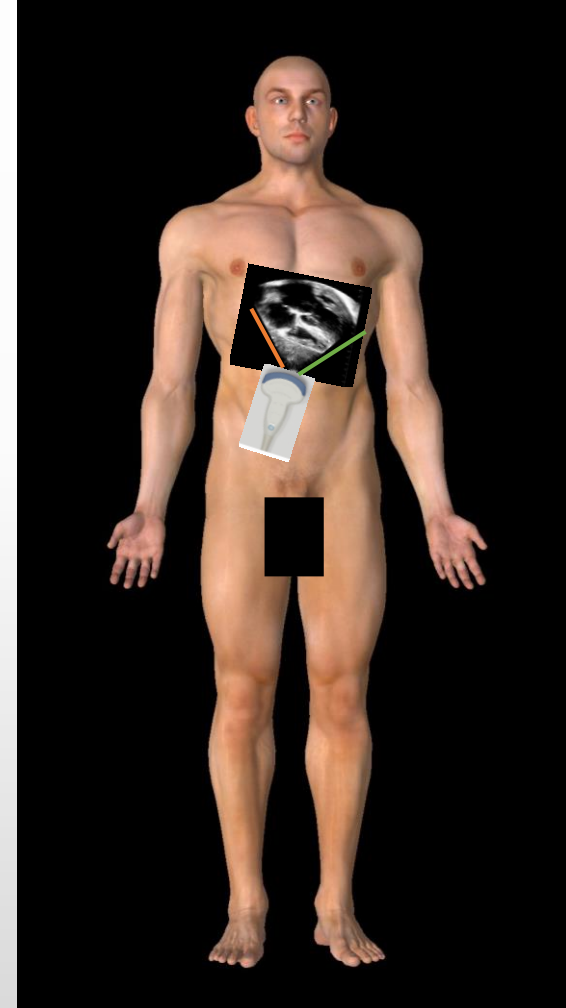
Probe Orientation in Subxiphoid View

Probe: Phased-Array

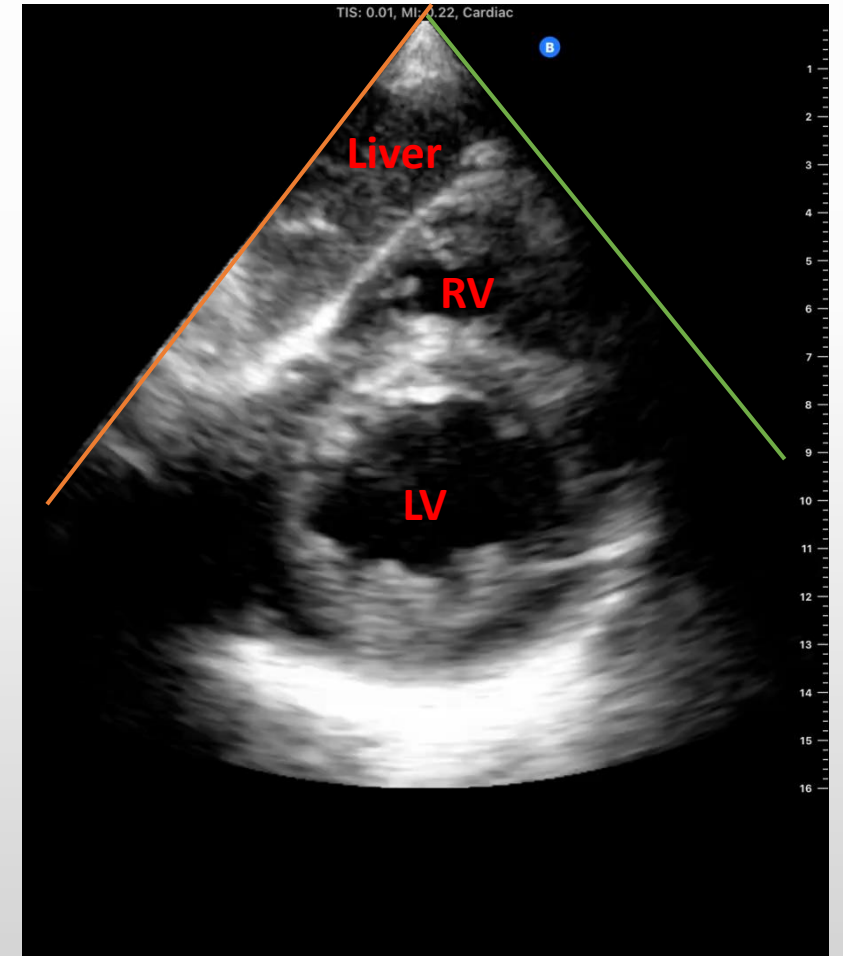
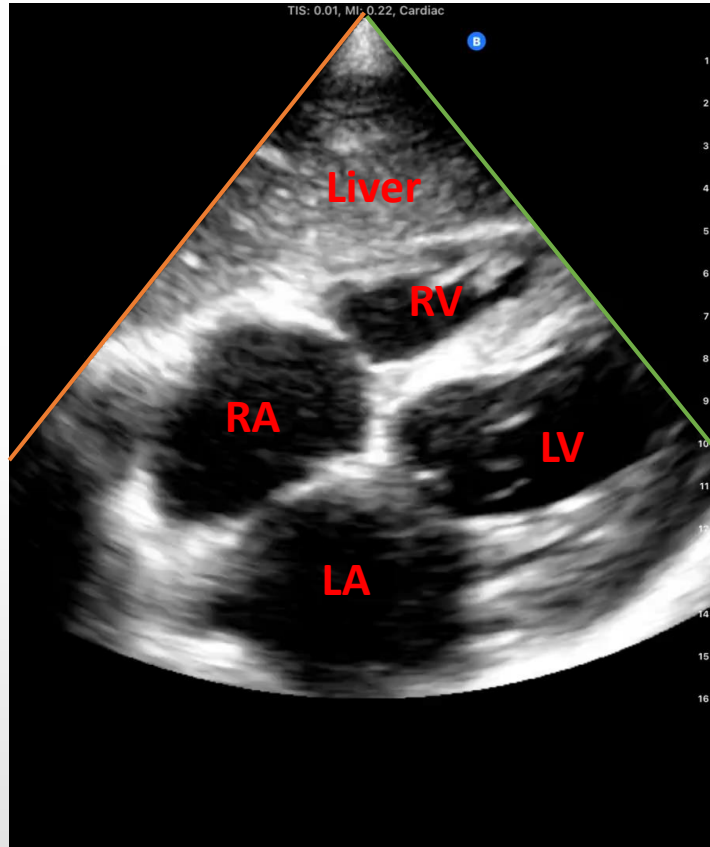
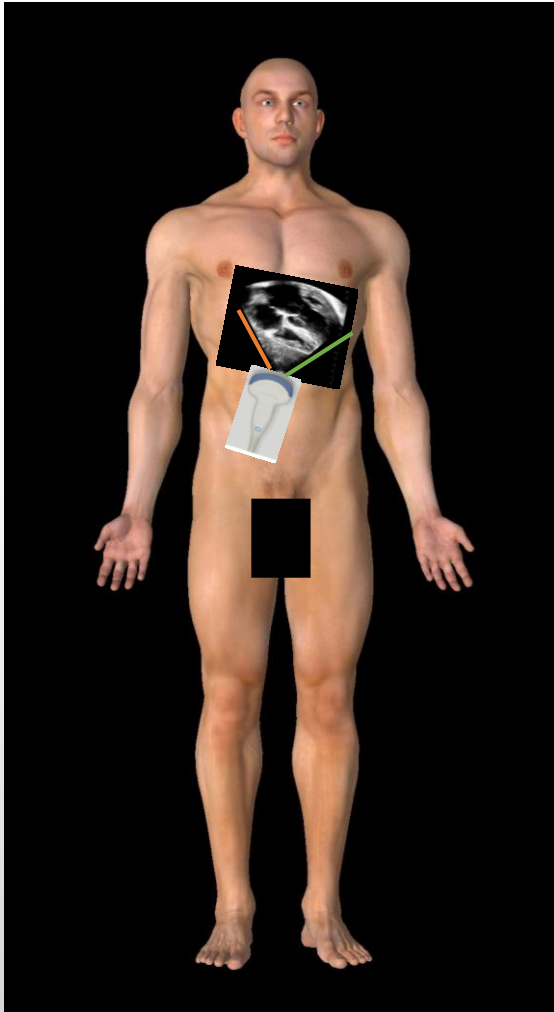
Preset: Cardiac

Probe location/marker: Position the probe under the costal arch (beneath the xiphoid process) with the indicator pointing towards the patient's left.

- Note: Since the plane of the heart is superficial, you need to use an overhand grip on the probe in order to be parallel with the skin



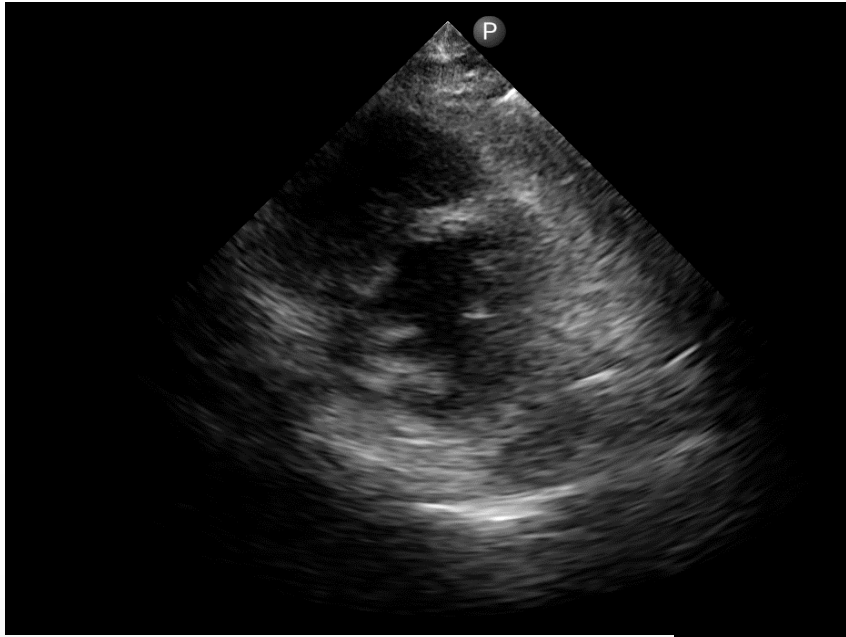
Subxiphoid View



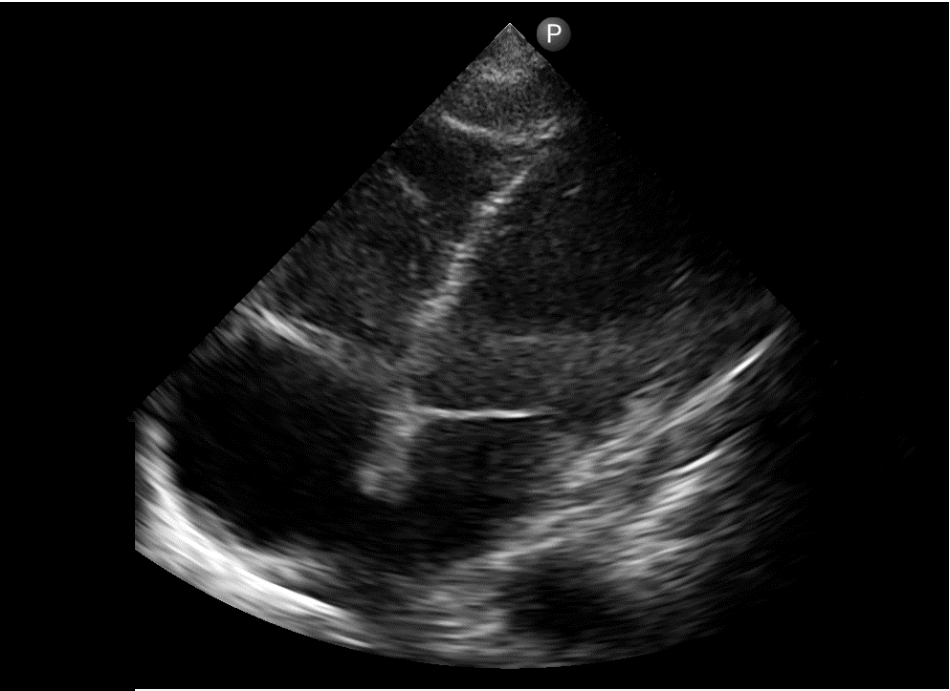
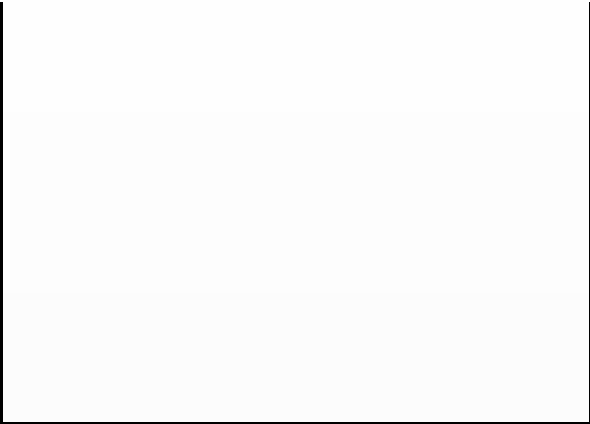
Cases and Pathology

Case

A 57 yo F with a PMH of DM2, HTN, and morbid obesity presents to the ED with sudden onset SOB. She recently returned from a trip overseas and was on a 14-hour flight. VS significant for BP 70/30, HR 115 bpm, RR 26, and O2 sat 86%. PE with elevated JVP, Tachycardia and regular rhythm, crackles b/l, and 2+ pitting edema. POCUS findings are shown on the following slide.



“D Sign”

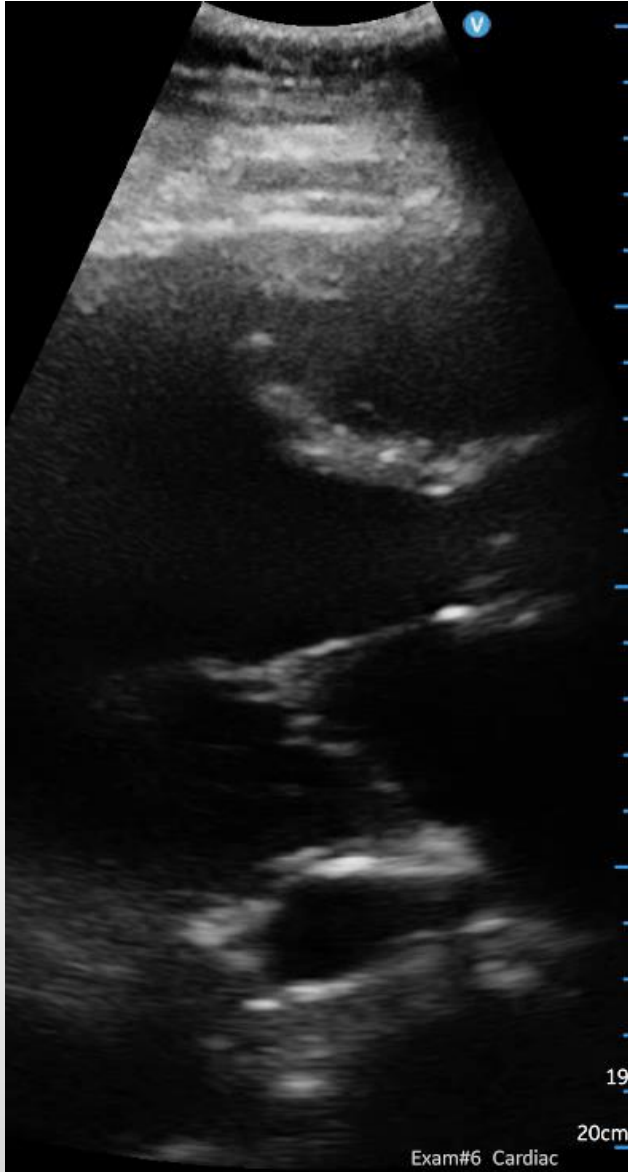


“McConnell’s Sign”



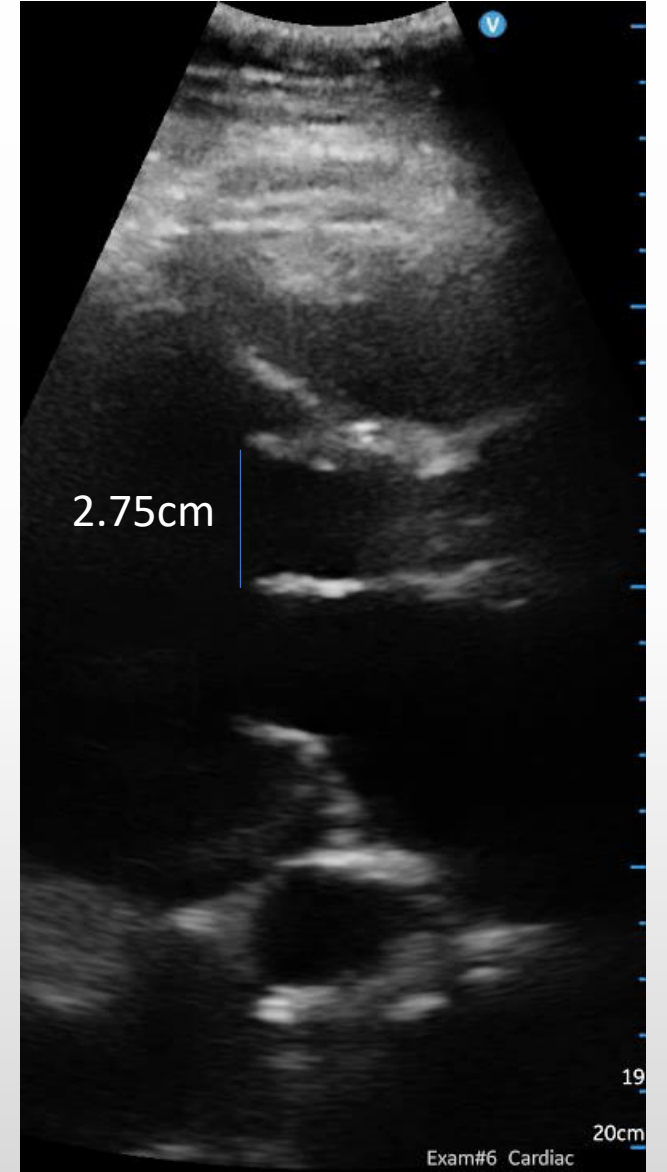
Case

62 yo M with no reported PMH presents to the ED with 1 wk hx/of worsening SOB, DOE, and orthopnea. Patient does not report any recent travel or family history of stroke or cardiac disease. VS on significant for a temp 98°F, BP 133/82, HR 92 bpm, RR 18, and O2 sat 98% on the ventilator. PE findings significant for elevated JVP, RRR, crackles bilaterally, and 3+ pitting edema b/l lower extremities. BNP 3,000. POCUS on the following slide.



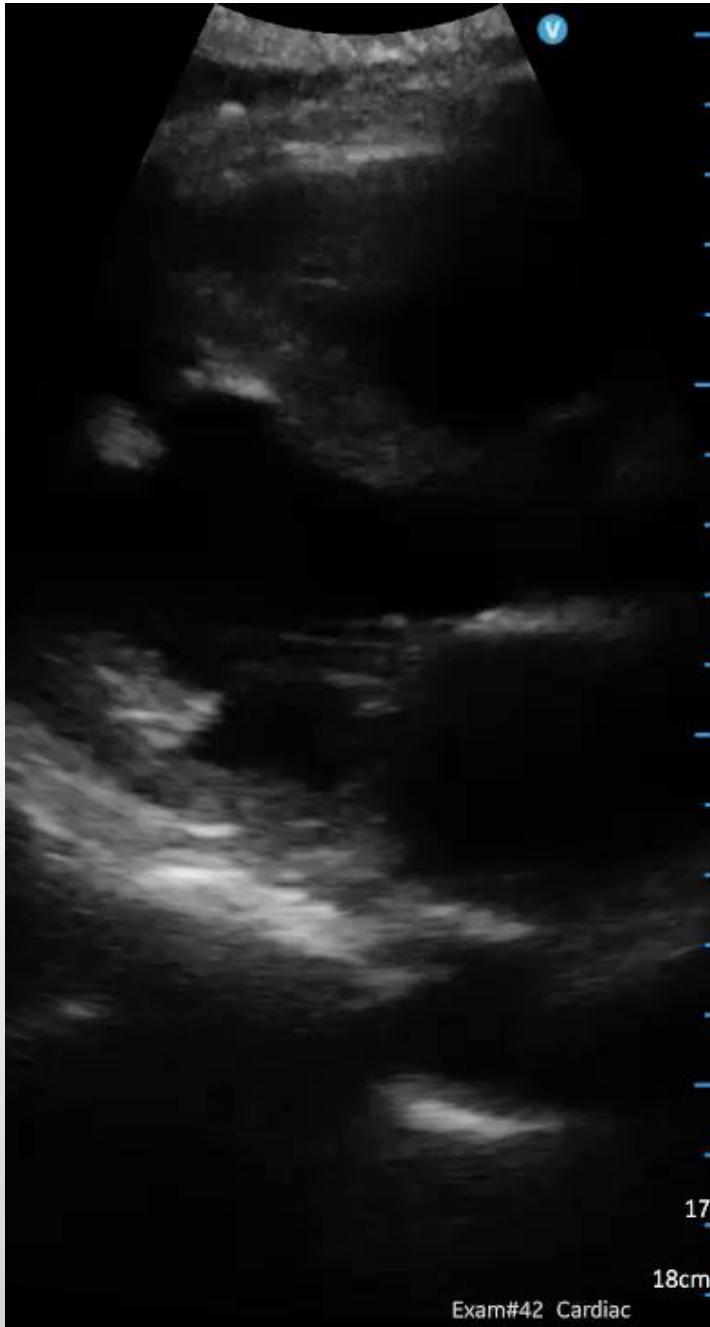
1. What cardiac view is this?
2. What's abnormal?

Let's calculate the end point septal separation!

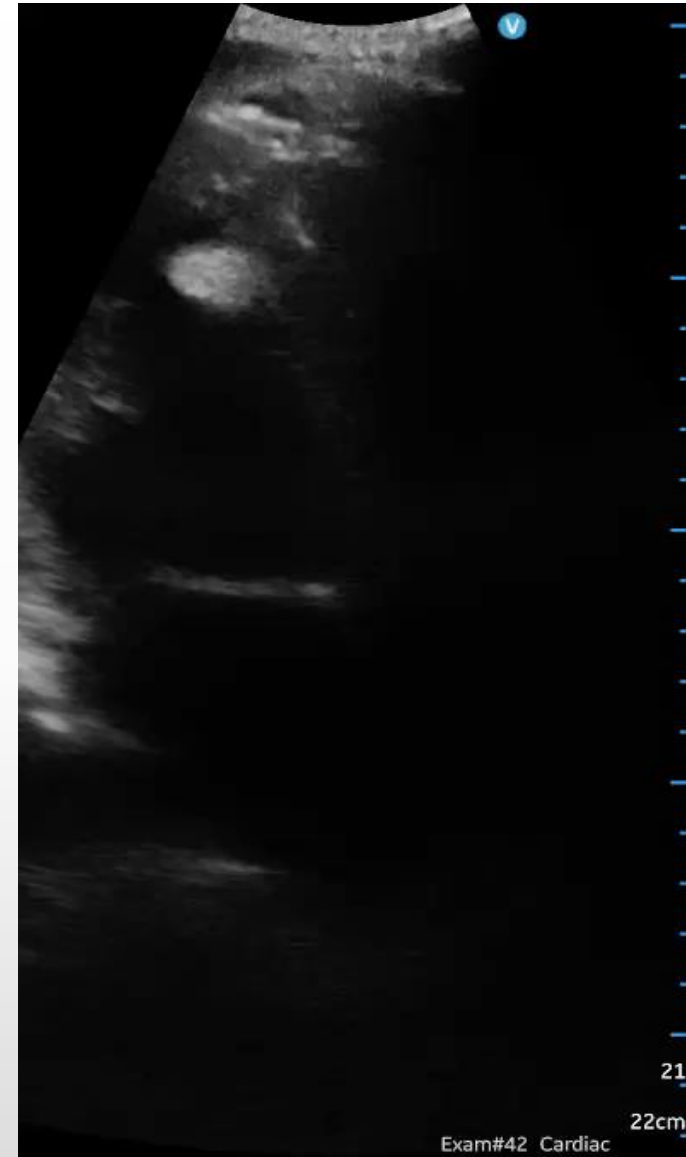


Case 3

67 yo M with PMH of HTN and HFrEF with EF 20-25% presents to the ED with right sided abd pain over the last 24 hours. CT scan of the abdomen/pelvis revealed bilateral renal infarcts R>L. On admission, you decide to do a bedside echo to look for any acute abnormalities that may explain his b/l renal infarcts.

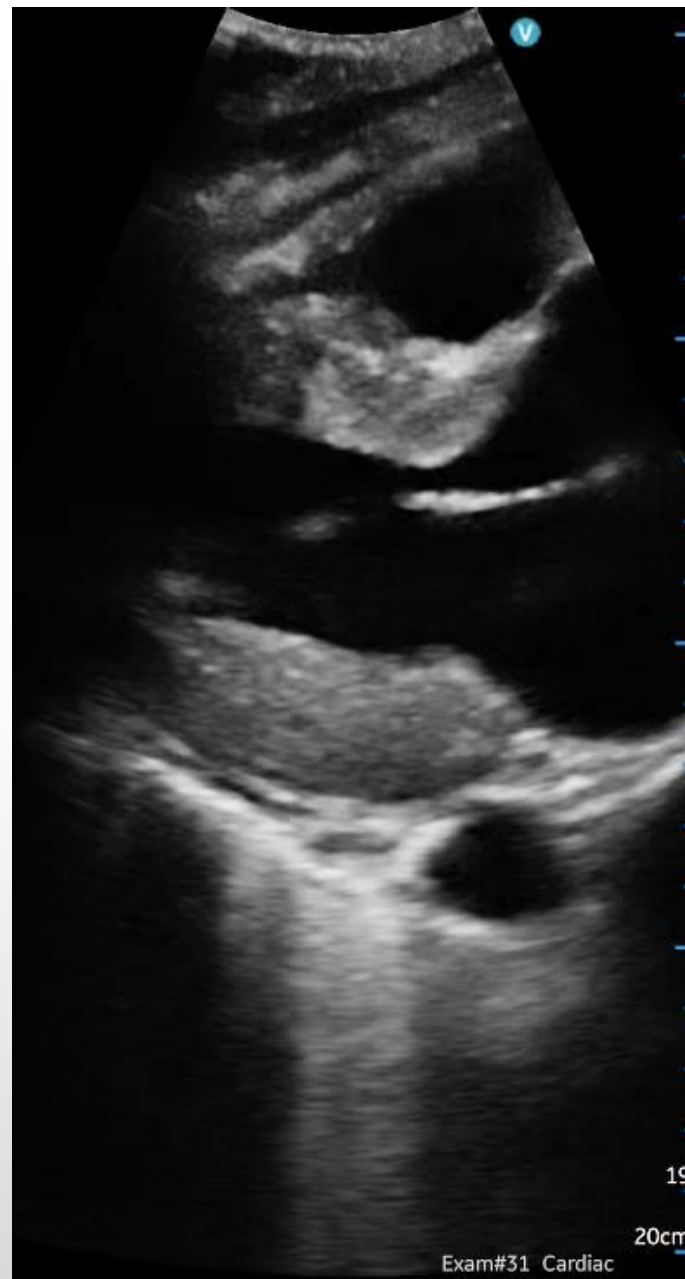


LV
thrombus



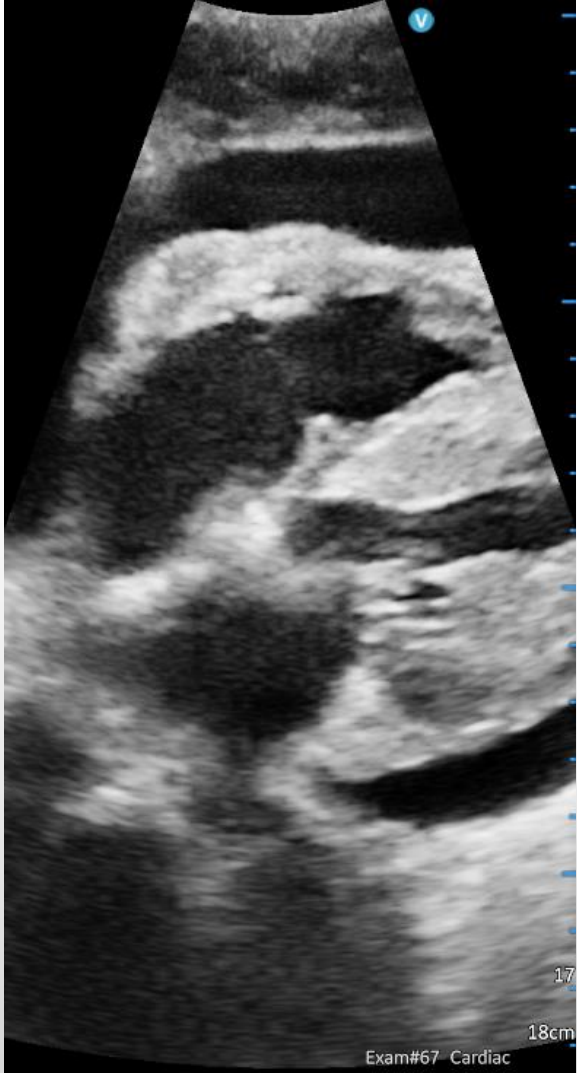
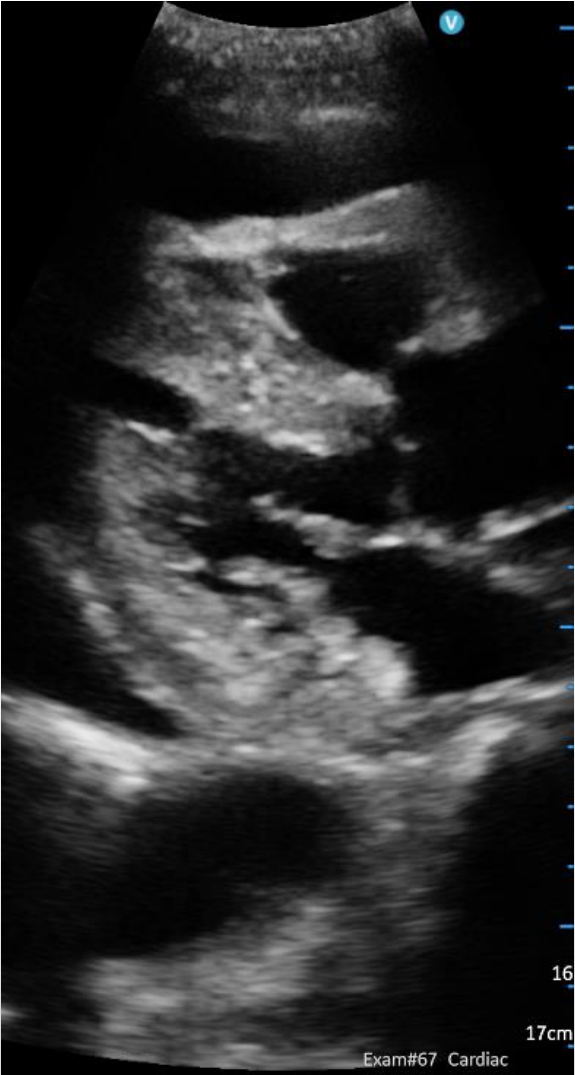
*image is flipped so that the left side of the image represents LA/LV

LV
hypertrophy



Exam#31 Cardiac

Pericardial effusion



Final Thoughts

- What's our main goal with ultrasound?
- What're our limitations?