eFAST EXAM

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Objectives

- What is the eFAST exam?
- Scanning technique
- Normal images
- Recognizing an abnormal exam

eFAST Tutorial Video (8:36)

- *ATTESTATION LINK AT END OF POWERPOINT*

- PLEASE WATCH THIS VIDEO!!!!

- https://www.youtube.com/watch?v=Yg78aU93SZE

Why use Ultrasound in Trauma?

- Literature supports its use
- Other options are less appealing
- Quick
- Non-invasive
- Portable
- Repeatable
- Inexpensive
- Easy to learn

What is the FAST Exam?

- Focused Assessment with Sonography for Trauma
- Per ATLS protocol, performed during the secondary survey
- Screening exam to evaluate for presence or absence of fluid in potential or dependent spaces
  - Pericardium – is there a pericardial effusion?
  - Peritoneum – is there fluid in the peritoneal cavity?
- eFAST – Extended FAST exam
  - Evaluating thorax – hemothorax or pneumothorax?
- Goal is to identify immediate or potential life threating scenarios in trauma and critically ill patients

Applications

- Blunt and penetrating abdominal trauma
- Blunt and penetrating chest trauma
- Hemodynamically unstable, undifferentiated hypotensive patient
- Ectopic pregnancy

Fluid Detection

- Overall, FAST exam 60-85% sensitivity and 90-99% specificity for detecting intraperitoneal free fluid (meaning, if negative, does not rule out injury)
  - Used as a rule-in, not rule-out tool

- RUQ is most sensitive view

- Detection of free intraperitoneal fluid depends on the quality of the exam (and skill of the operator)
  - 700cc if you're just ok
  - 500cc if you're good
  - 300cc if you're great

Limitations to Ultrasound

- Solid organ injury
- Hollow viscus injury
- Pancreatic injury
- Retroperitoneal trauma
- Diaphragm injury/perforation
- Clotted blood
- Body habitus
- Operator dependent

Required Views

1. Right upper quadrant (Morison's pouch)
2. Left upper quadrant (Splenorenal recess)
3. Sub-xiphoid cardiac window (Subcostal view)
4. Suprapubic window (Pelvic view)
5. Right thorax
6. Left thorax

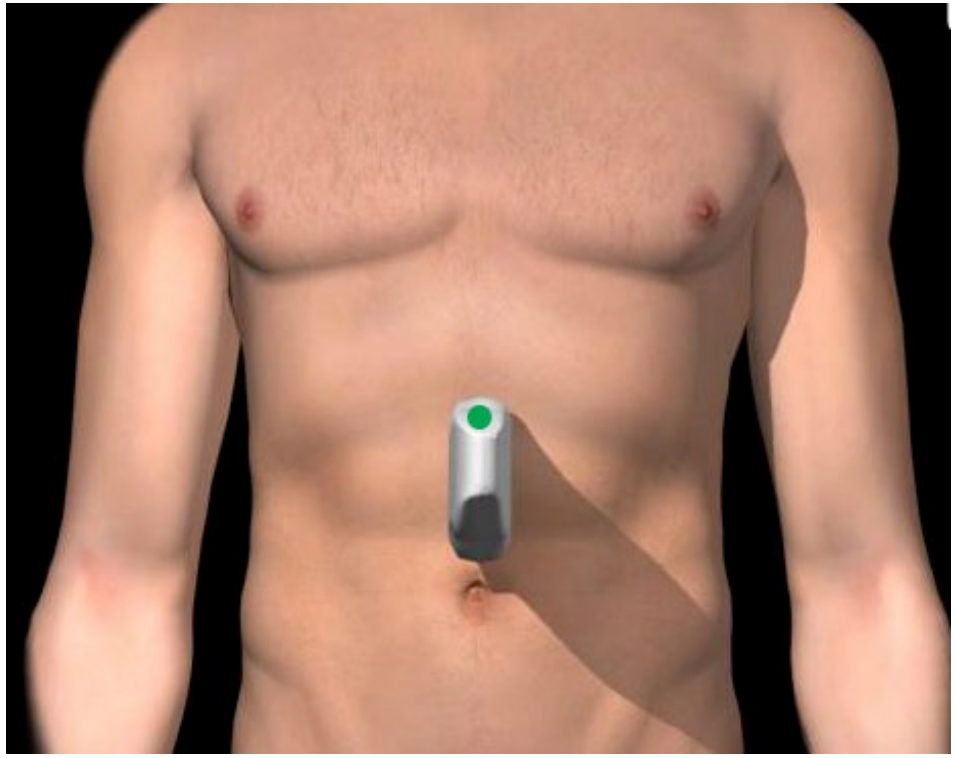
Fan the probe at each of these views to fully evaluate for a pocket of fluid

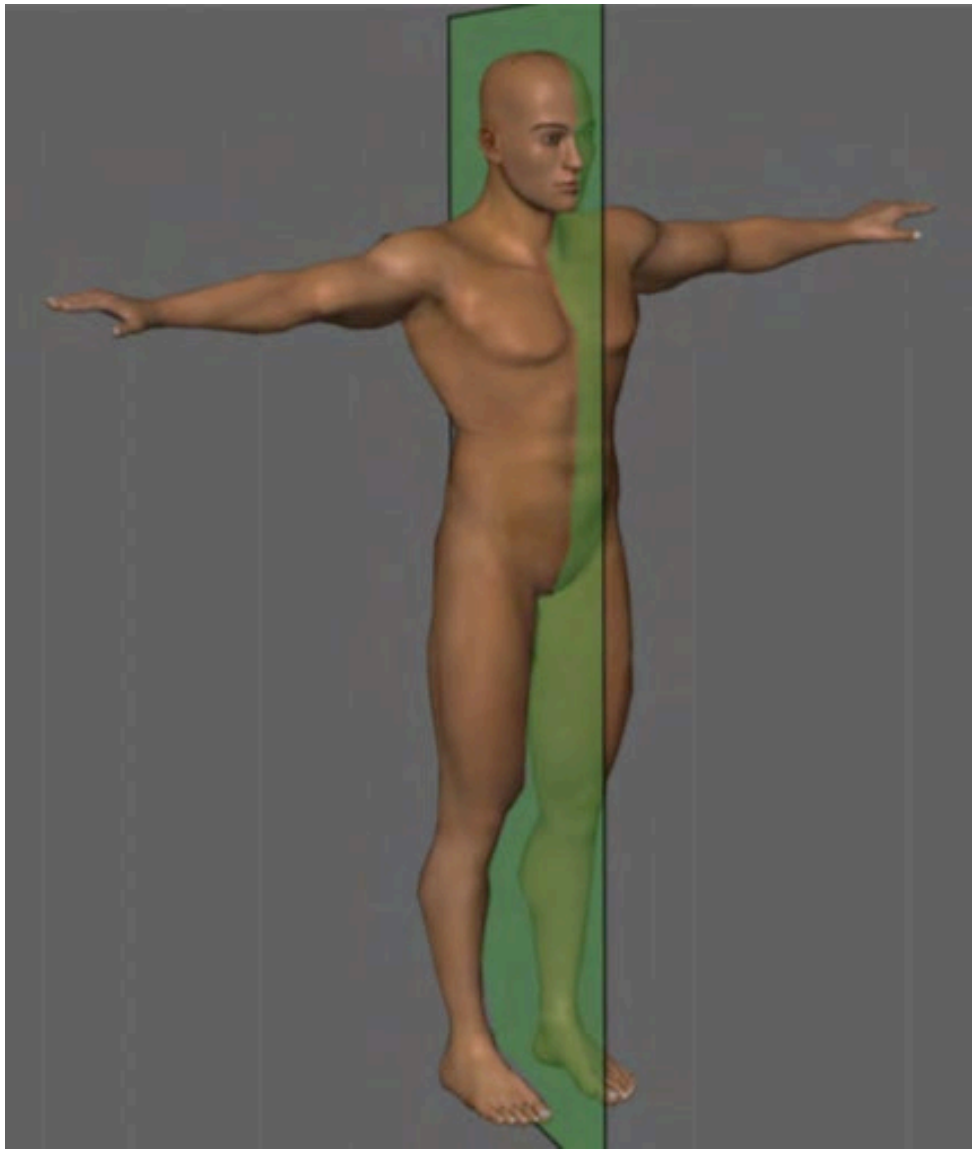
Scanning Technique

- Transducer Selection
  - Curvilinear or Phased Array

Scanning Planes

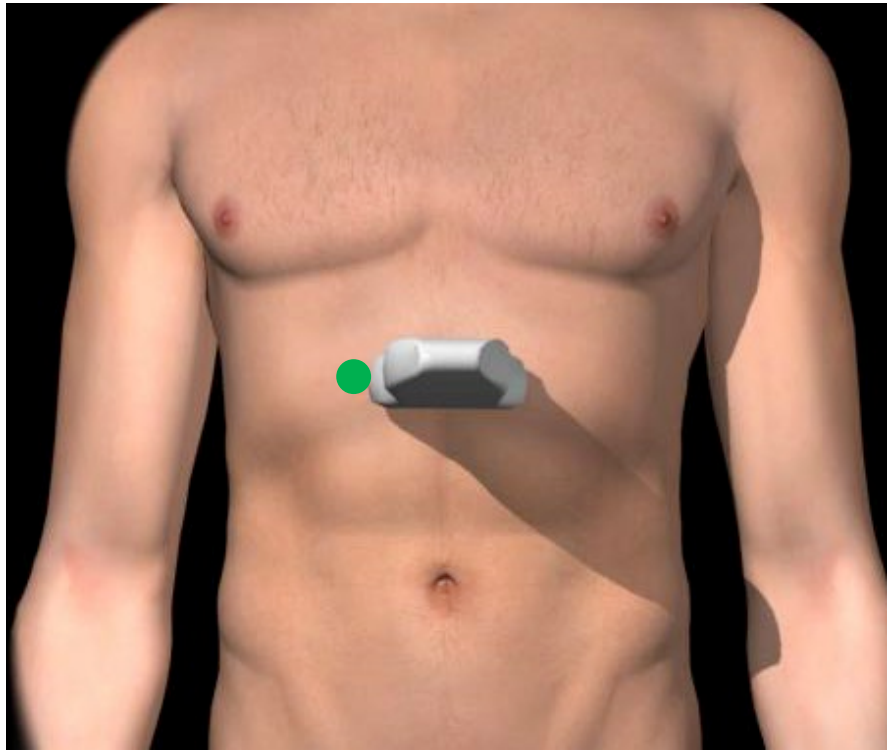
- Longitudinal or Sagittal

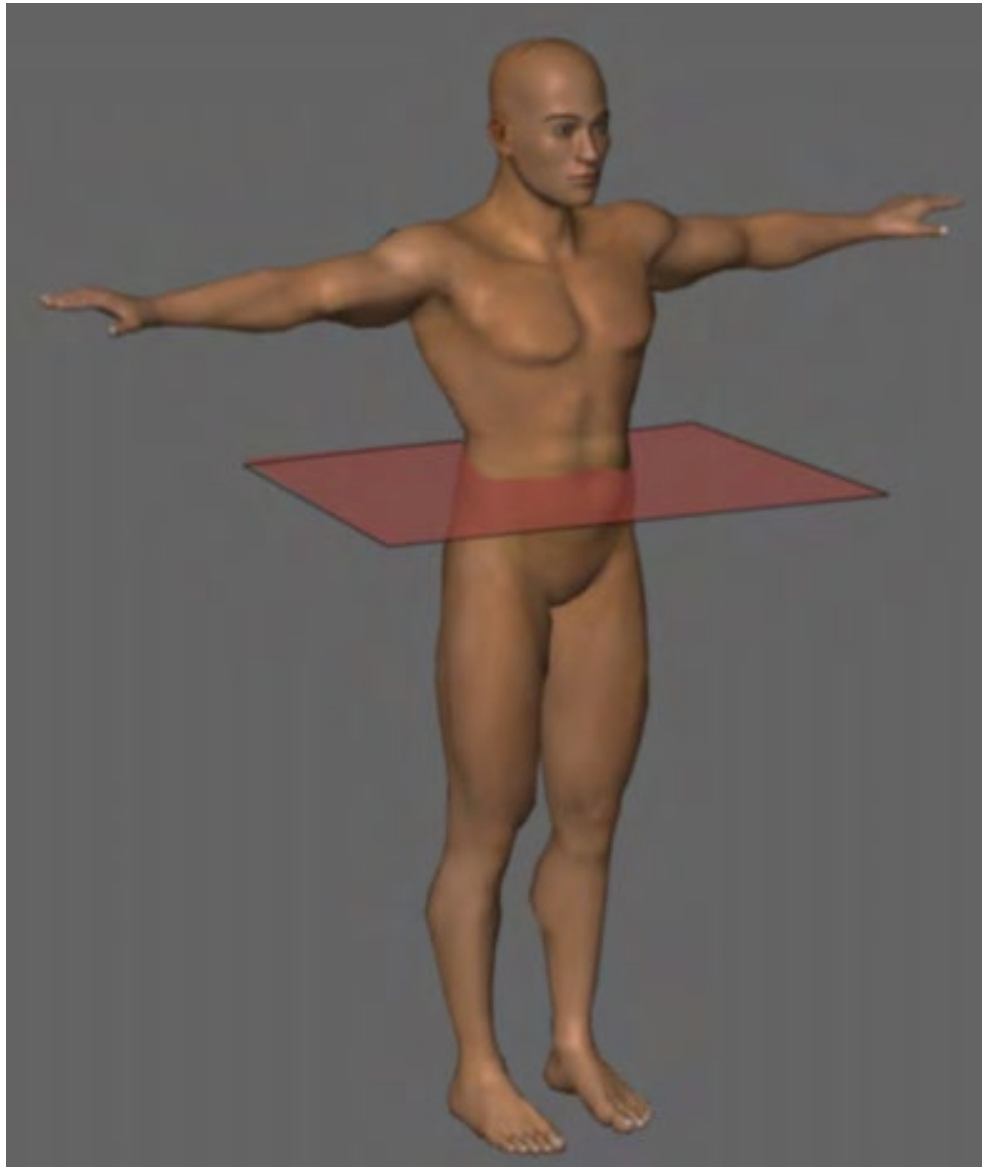




Scanning Planes

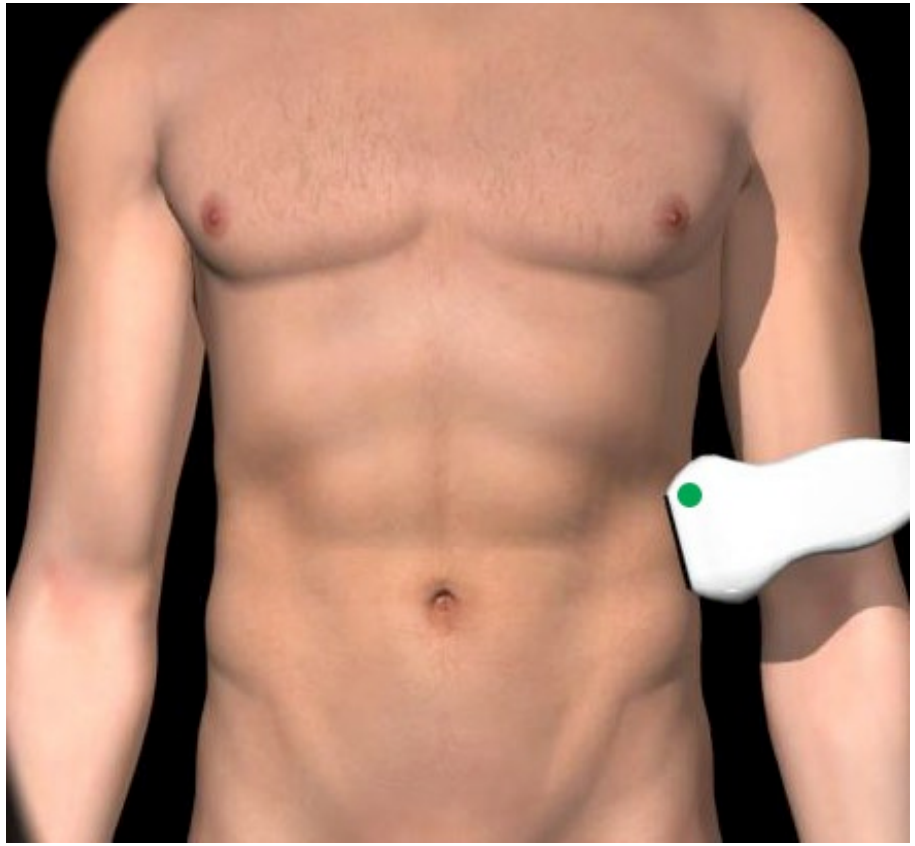
- Transverse

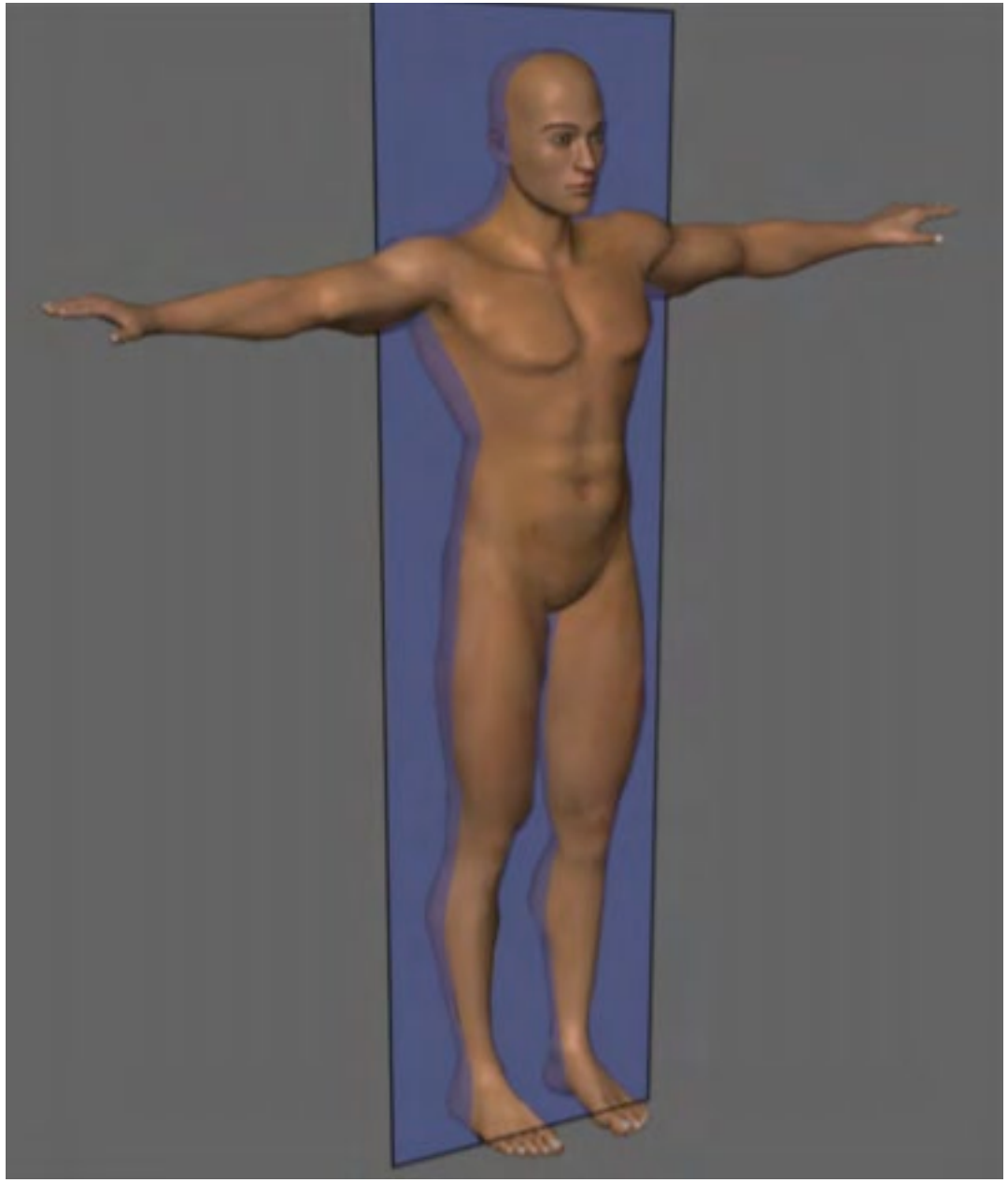




Scanning Planes

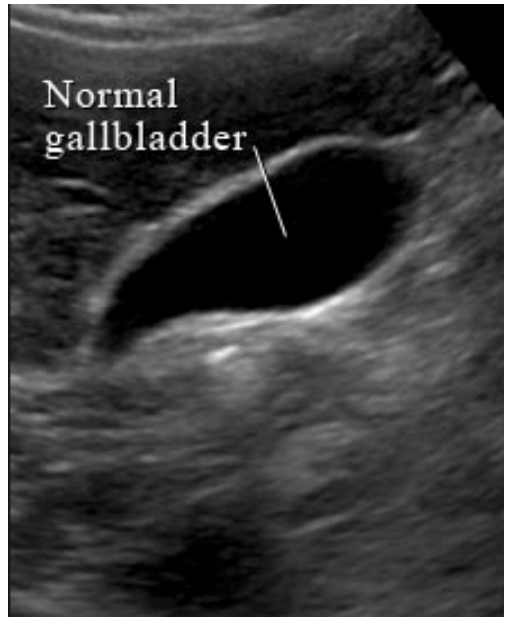
- Coronal



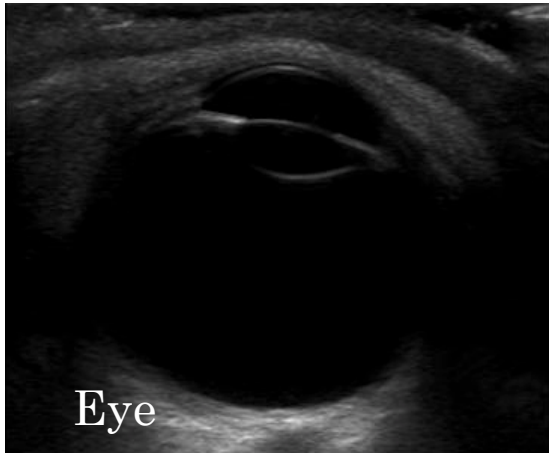


Fluid = Abnormal

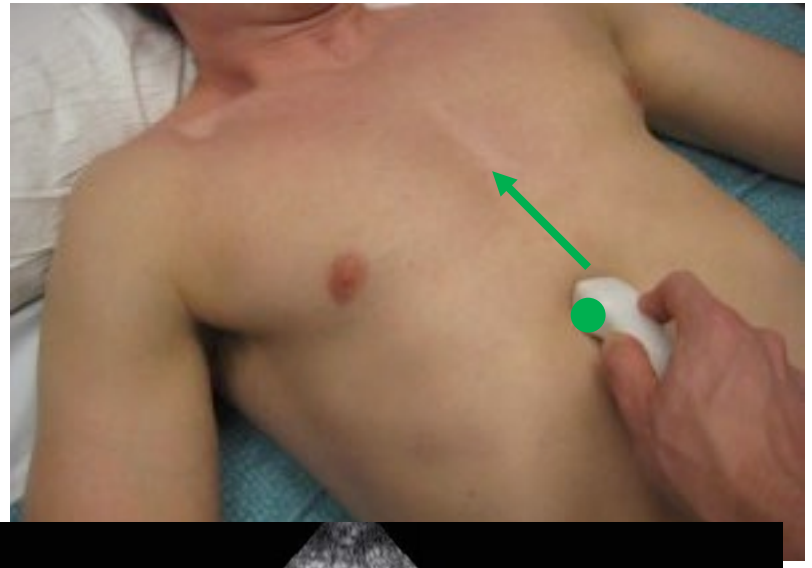
- Fluid appears black on ultrasound (anechoic)



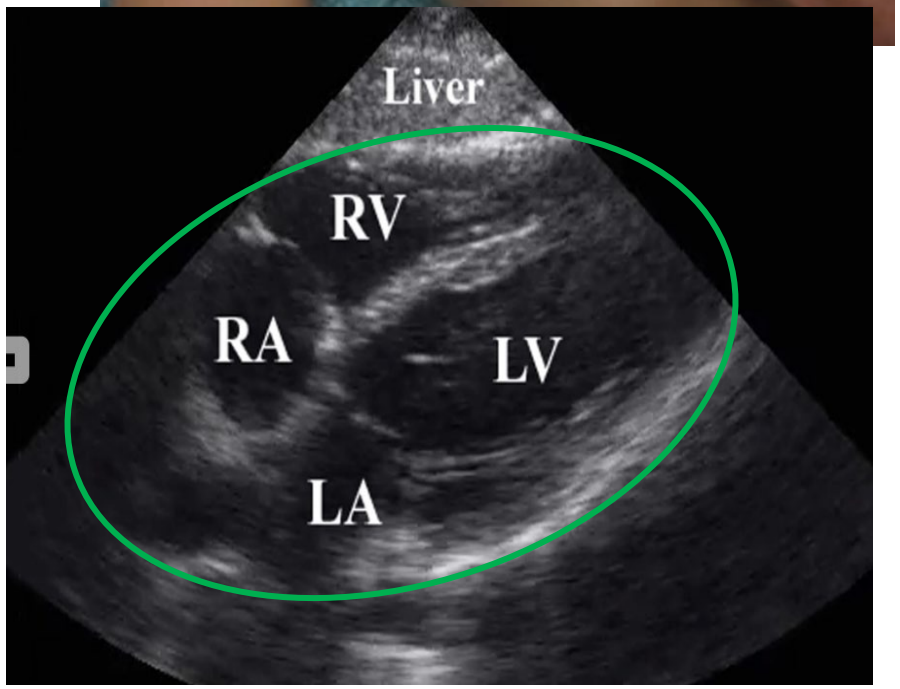
- Presence of free fluid = positive eFAST exam



Sub-xiphoid cardiac window (Subcostal view)

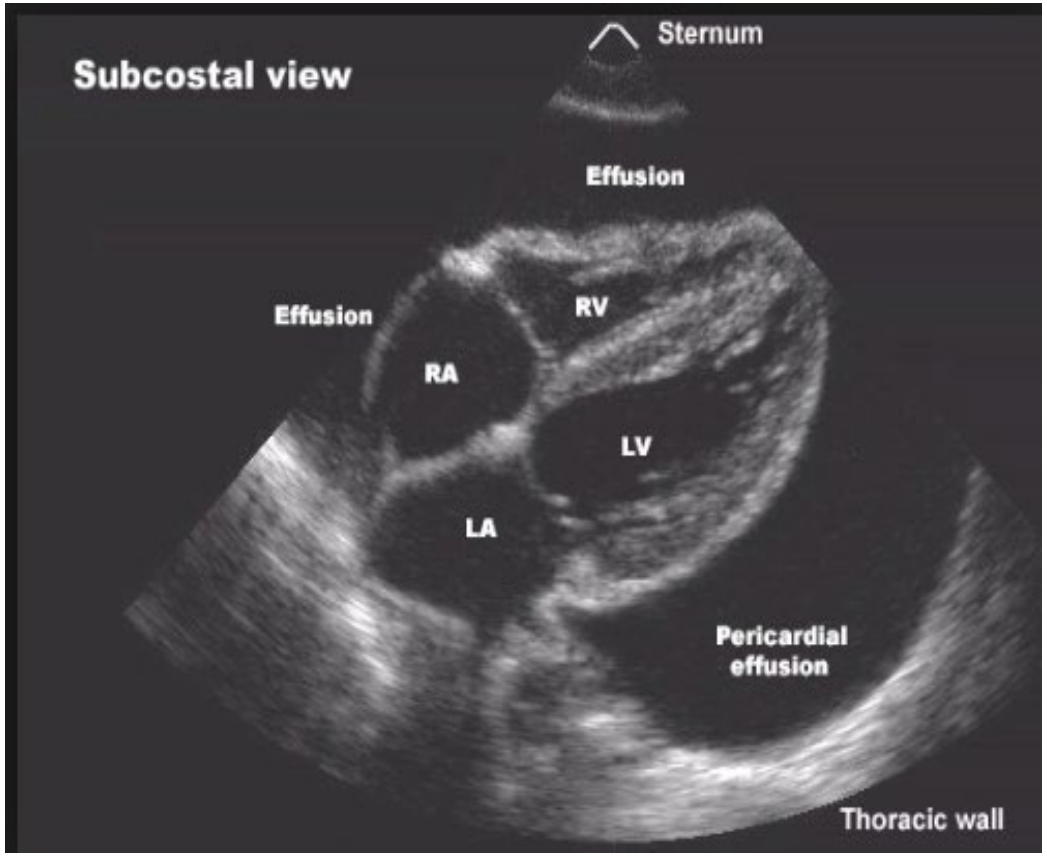


- Probe position
  - Inferior to xiphoid process
  - Indicator marker towards patient's right
  - Aim beam towards patient's head
- Structures to identify
  - 4 chamber cardiac view
  - Inferior and superior pericardium
- Tips
  - Scan through the liver (use as acoustic window)
  - Have patient take a deep breath or bend legs



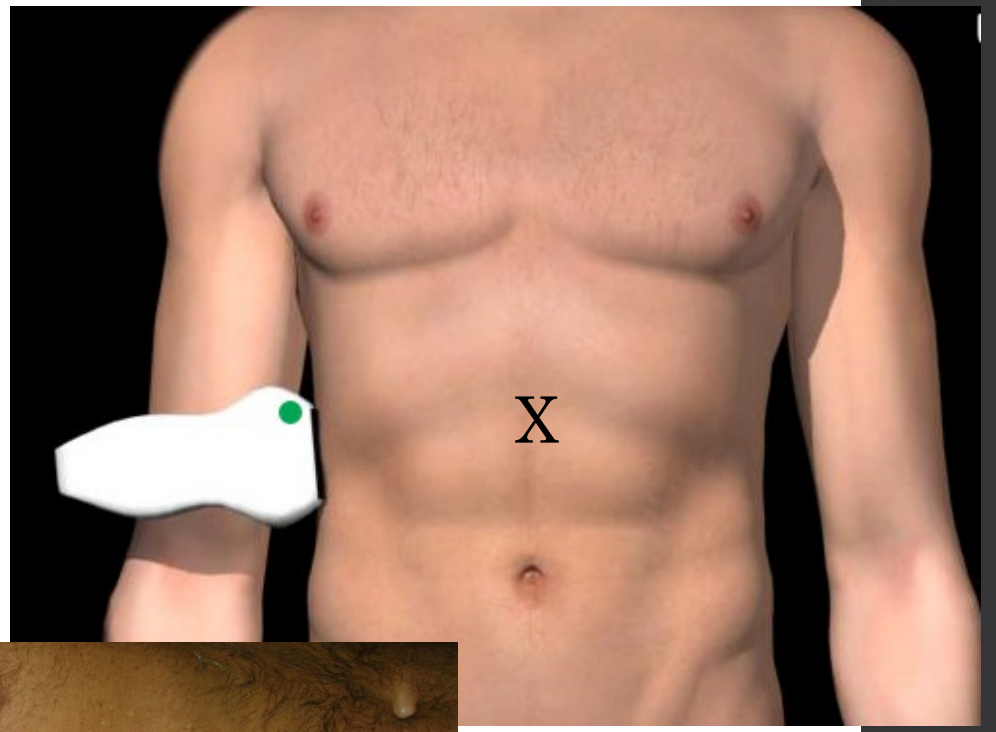
Sub-xiphoid cardiac window (Subcostal view)

- Smaller effusions located more inferiorly
- Larger effusions will be more uniformly distributed



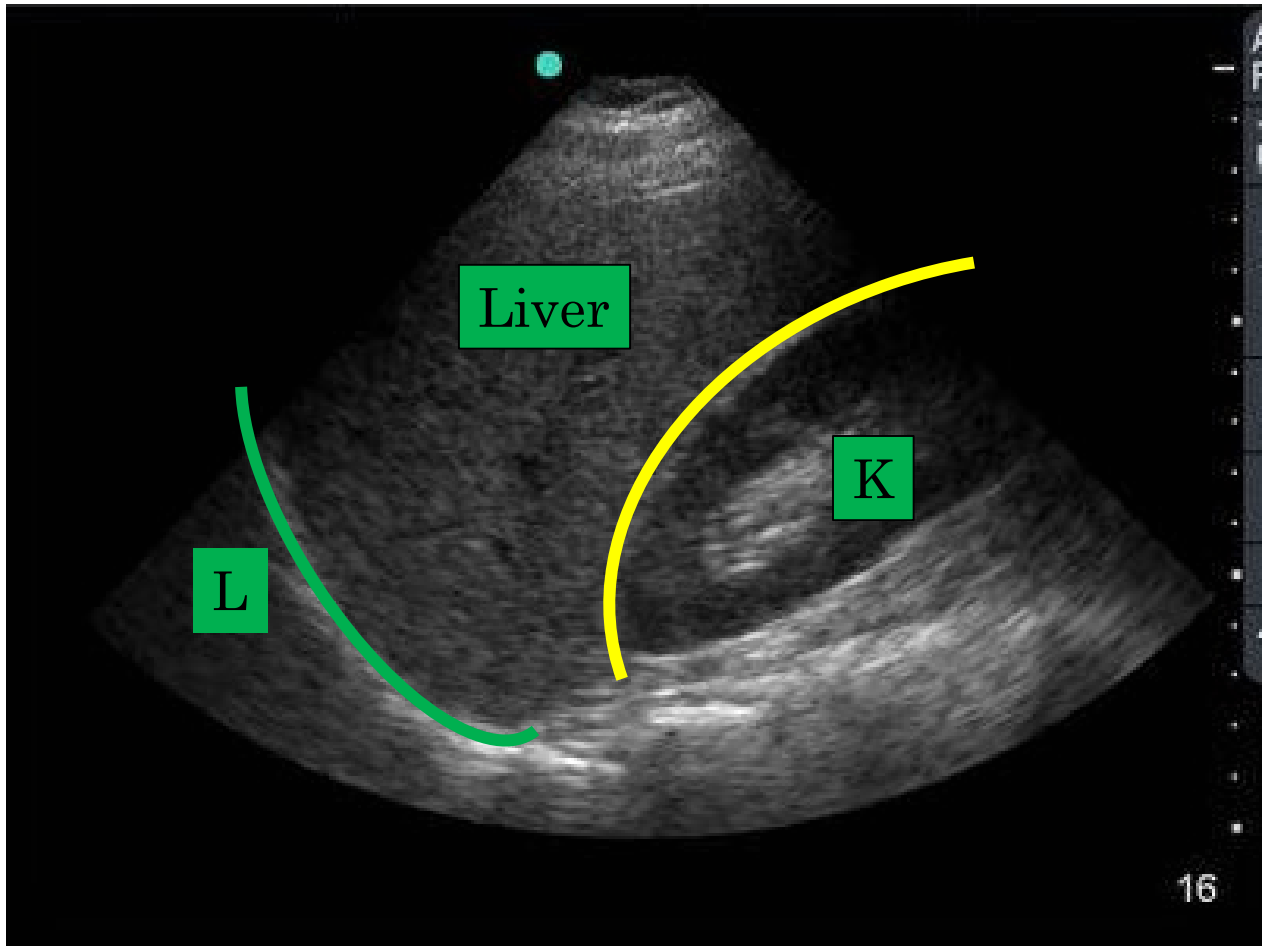
Right Upper Quadrant (Morison's pouch)

- Probe position
  - Coronal plane
  - Probe marker towards patient's head
  - 8-11th ribs or horizontal sub-xiphoid (HS) landmark
  - Mid-axillary line

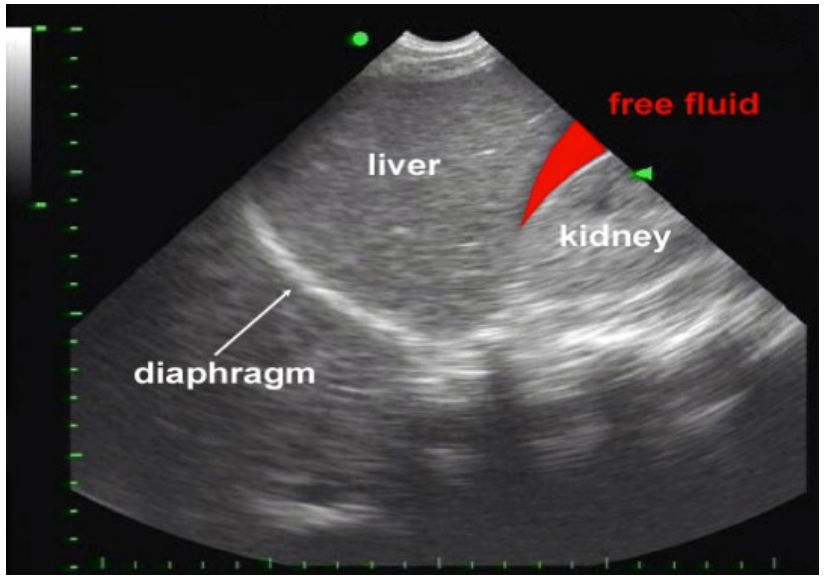


Right Upper Quadrant (Morison's pouch)

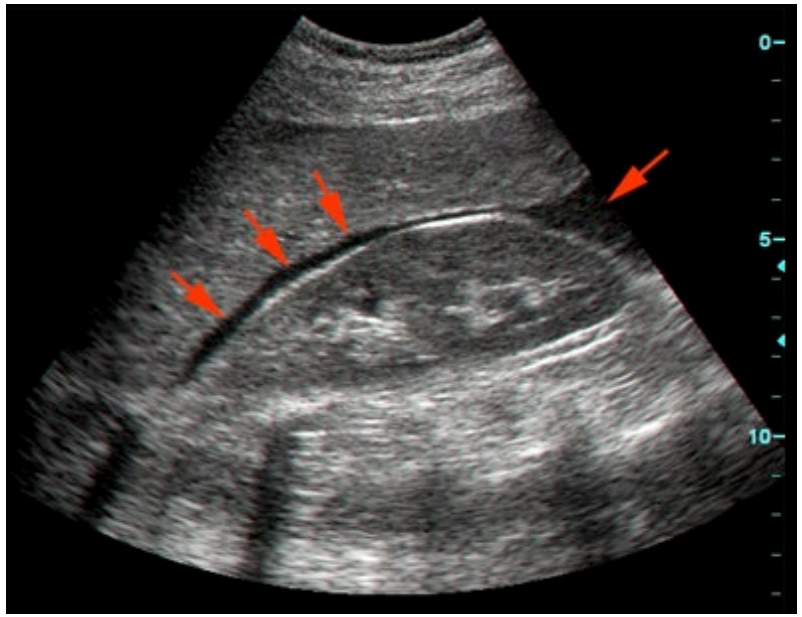
- Structures to identify
  - Lung (should appear as mirror image of liver)
  - Diaphragm
  - Liver
  - Right kidney
  - Morison's pouch (potential space between the liver and kidney



Right Upper Quadrant Positive FAST

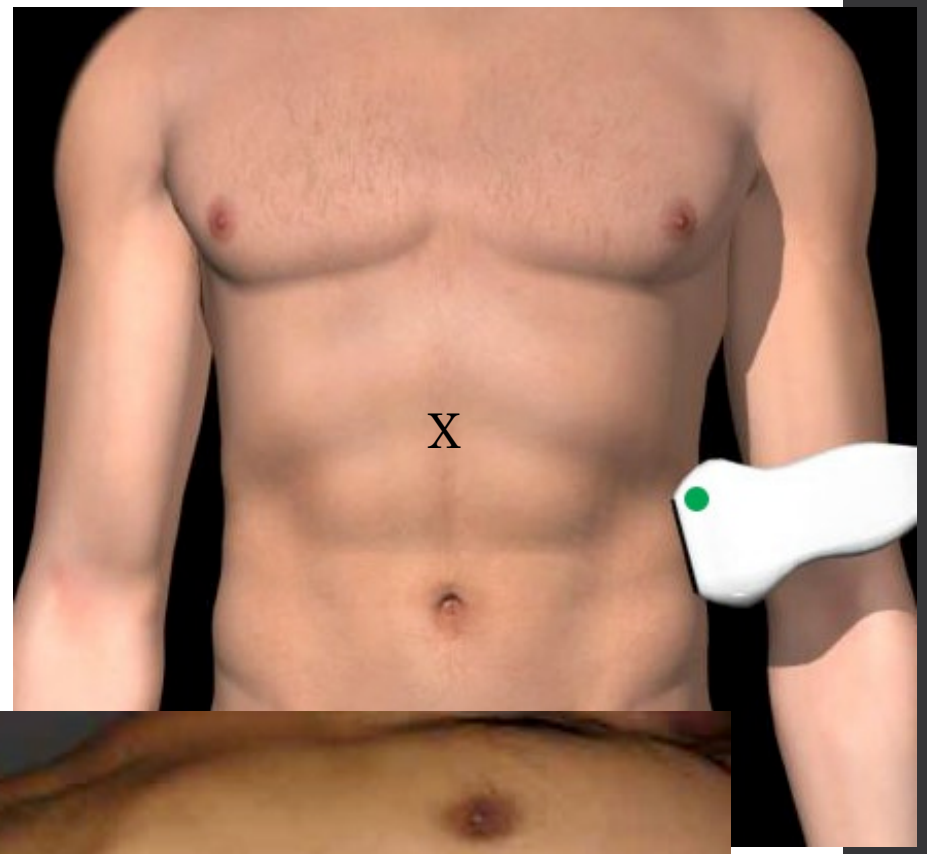


- Locations where blood can accumulate:
  - Morison's pouch
  - Inferior pole of the kidney
  - Liver tip
  - Below the diaphragm/above the liver
  - Above the diaphragm



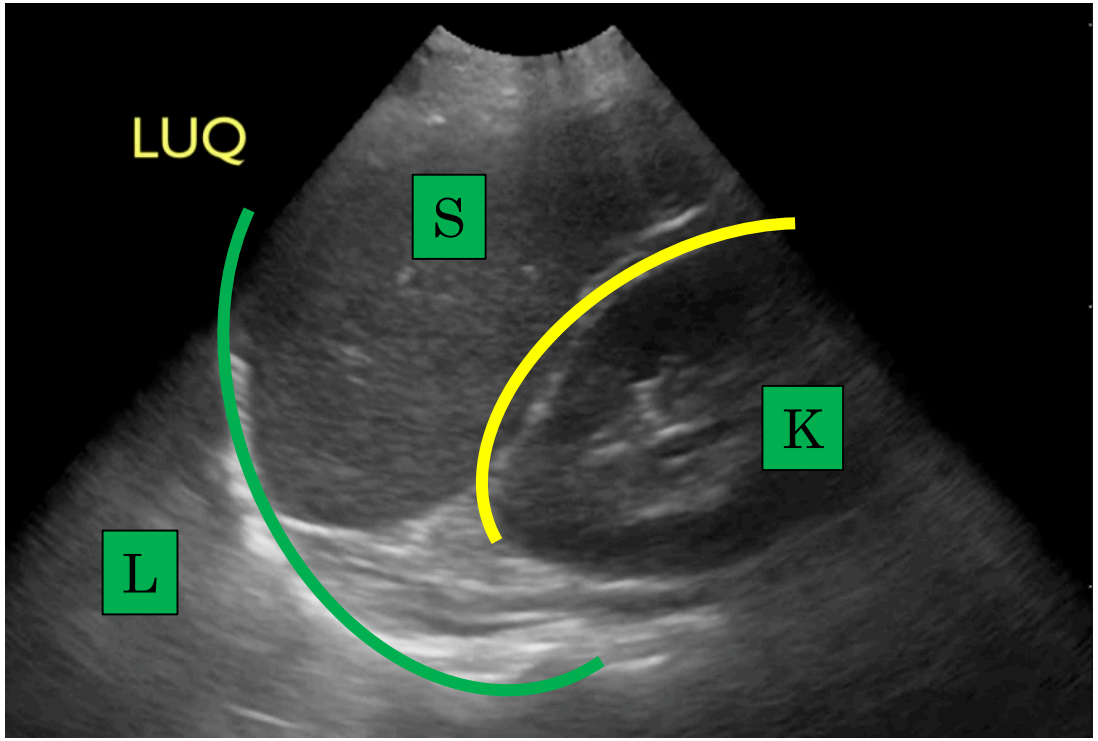
Left Upper Quadrant (Splenorenal recess)

- Probe position
  - Coronal plane
  - Indicator towards the patient's head
  - 6-9th rib space or HS landmark
  - "Knuckles to the bed"

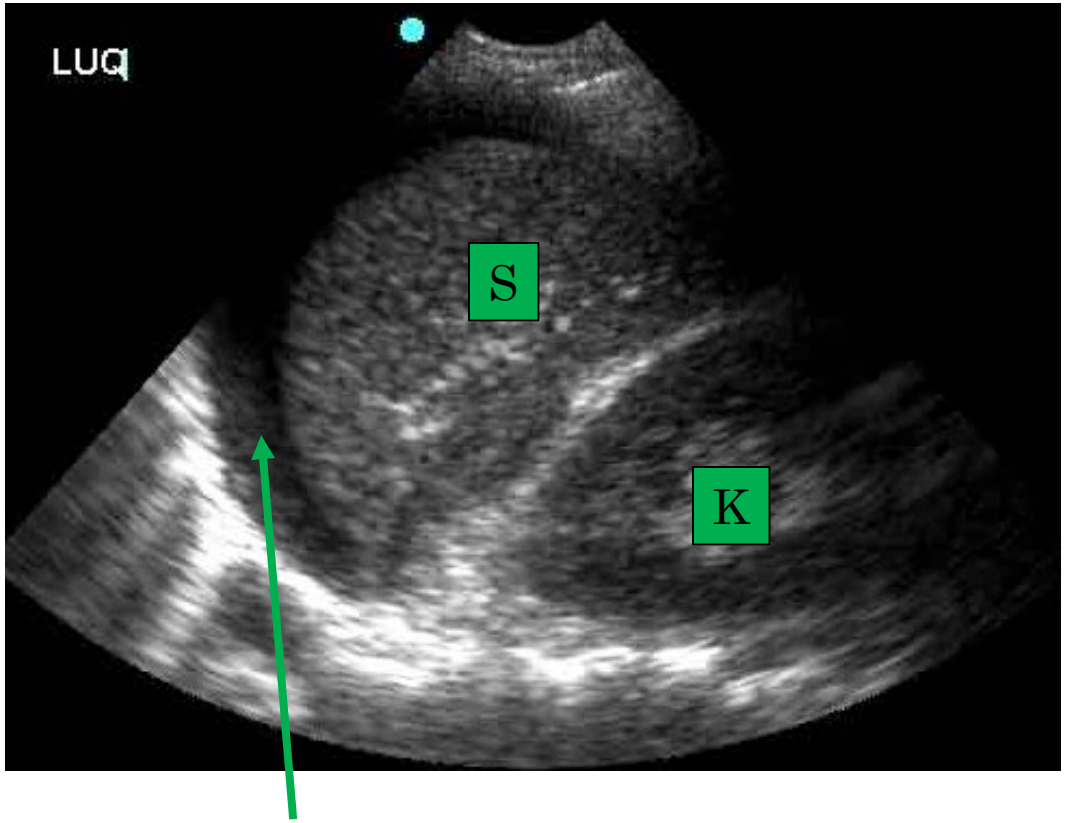


Left Upper Quadrant (Splenorenal recess)

- Structures to identify
  - Lung (should appear as mirror image of spleen)
  - Diaphragm
  - Spleen
  - Left kidney
  - Splenorenal recess (potential space)



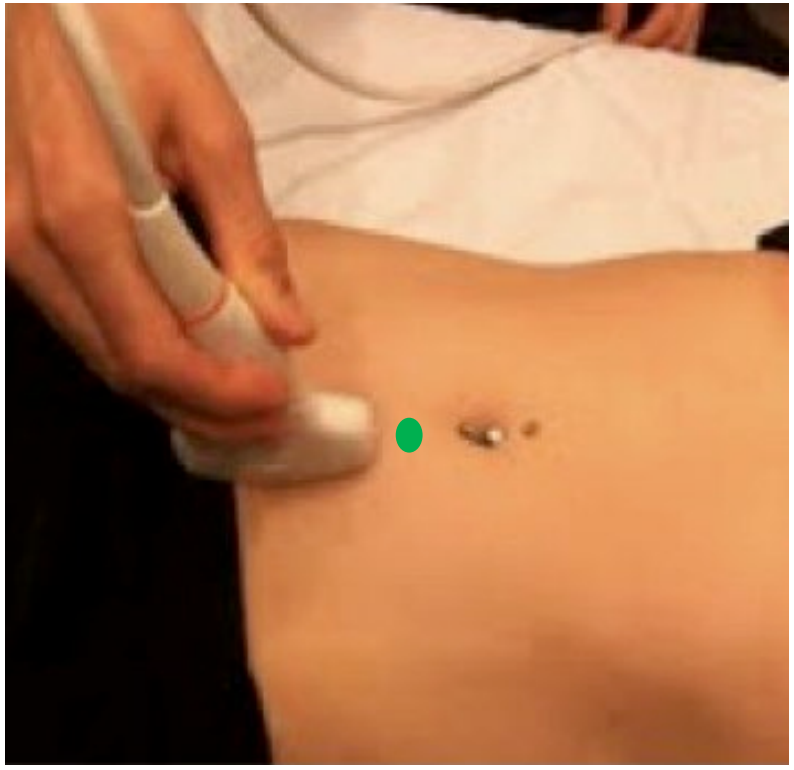
Left Upper Quadrant Positive FAST



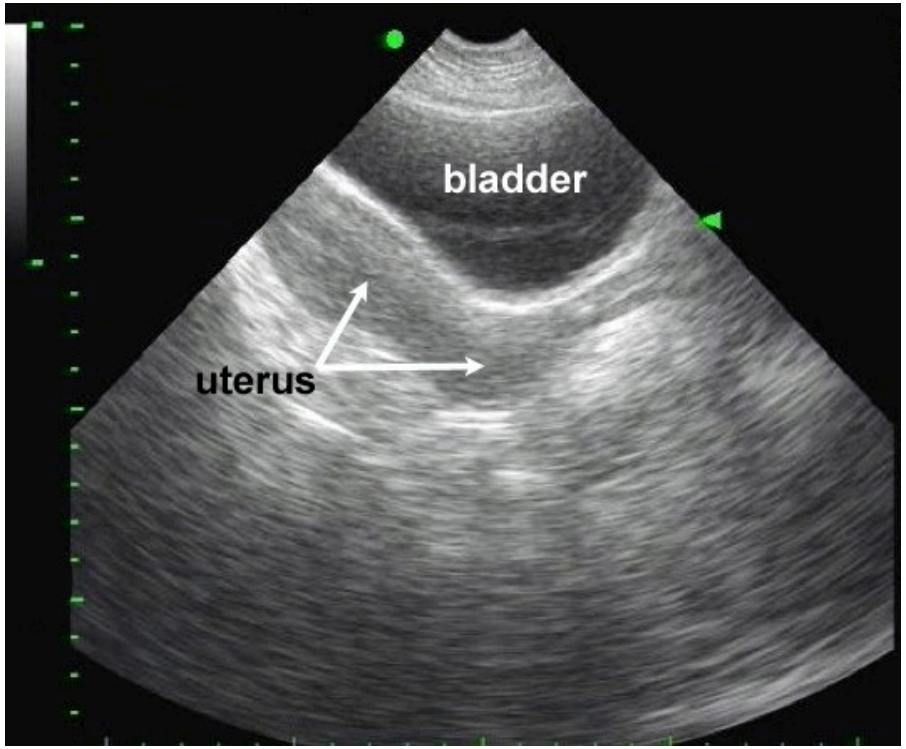
- Locations where blood can accumulate:
  - Splenorenal recess
  - Inferior pole of the kidney
  - Splenic tip
  - Below the diaphragm/above the spleen
  - Above the diaphragm

Suprapubic Window (Pelvic view)

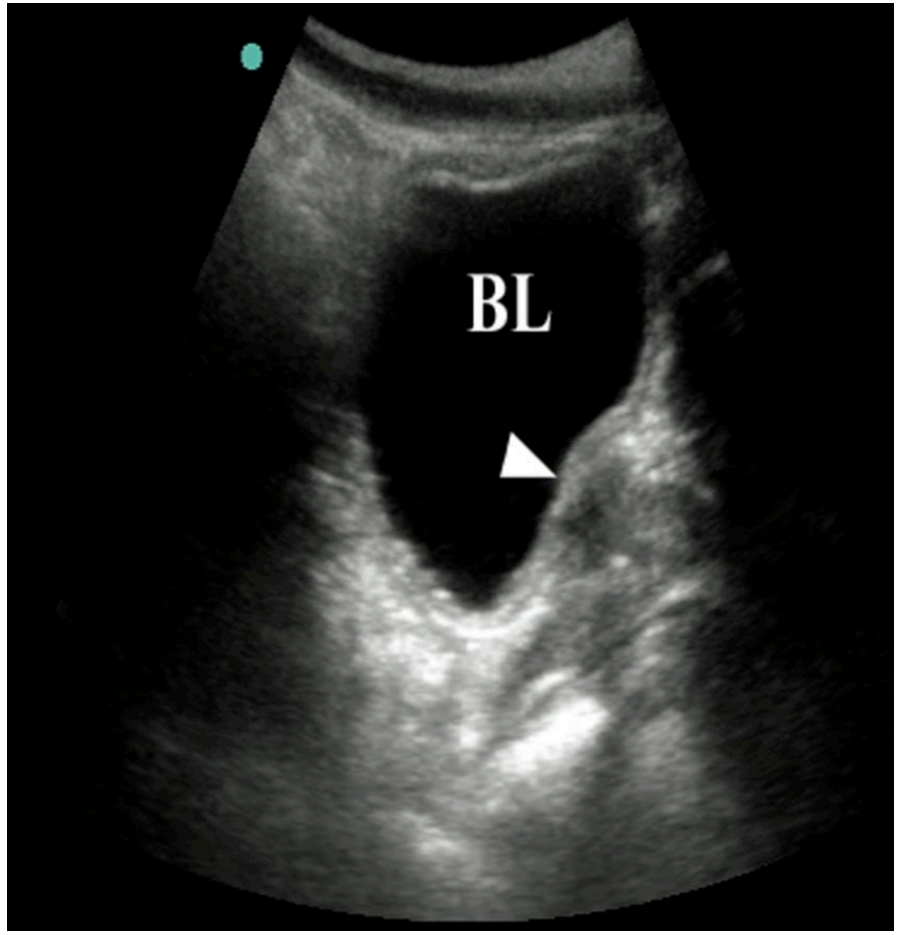
- Probe position
  - Sagittal plane (indicator towards head)
  - Transverse plane (indicator to right)
  - Place just cephalad to pubic bone



Suprapubic Window (Longitudinal View)

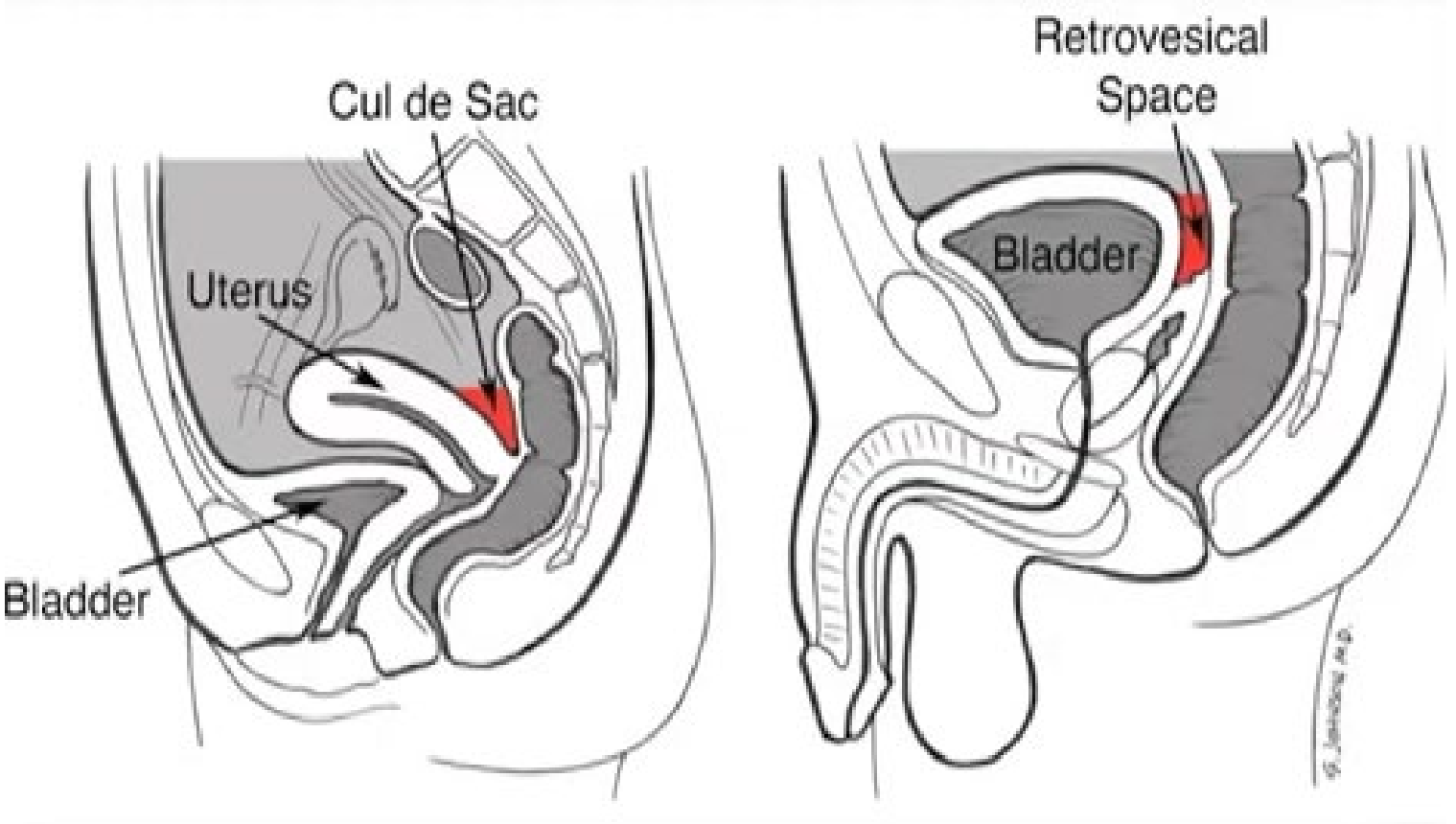


Female
- -Bladder
- -Uterus



Male
- -Bladder
- -Prostate (arrowhead)

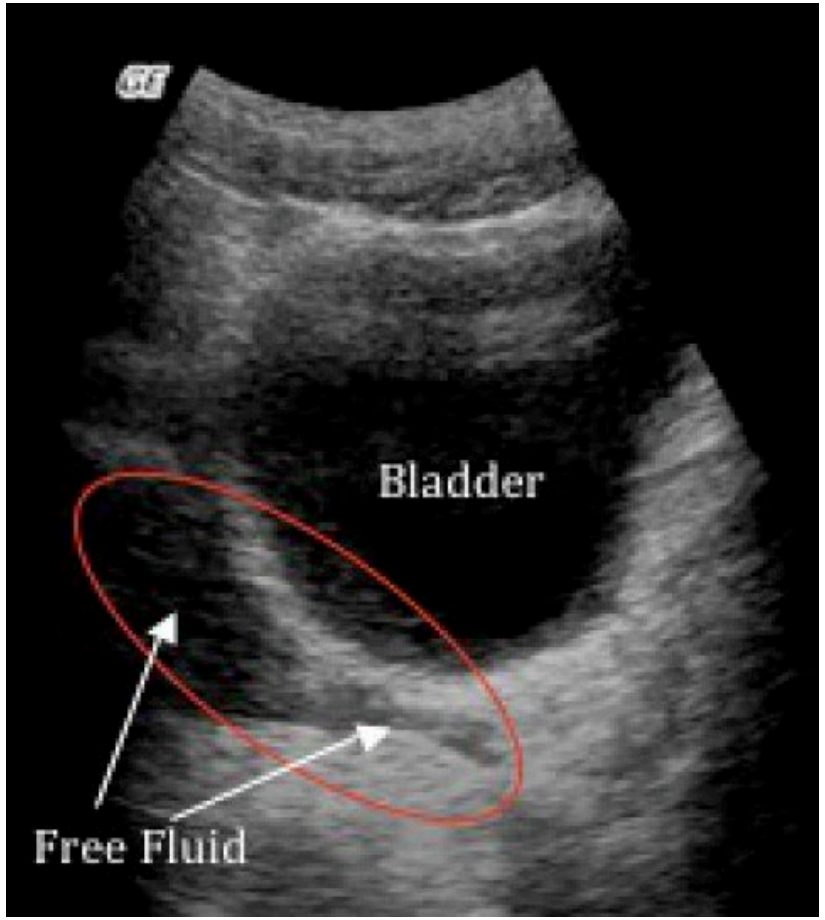
Suprapubic Window
Potential Spaces (Sagittal View)



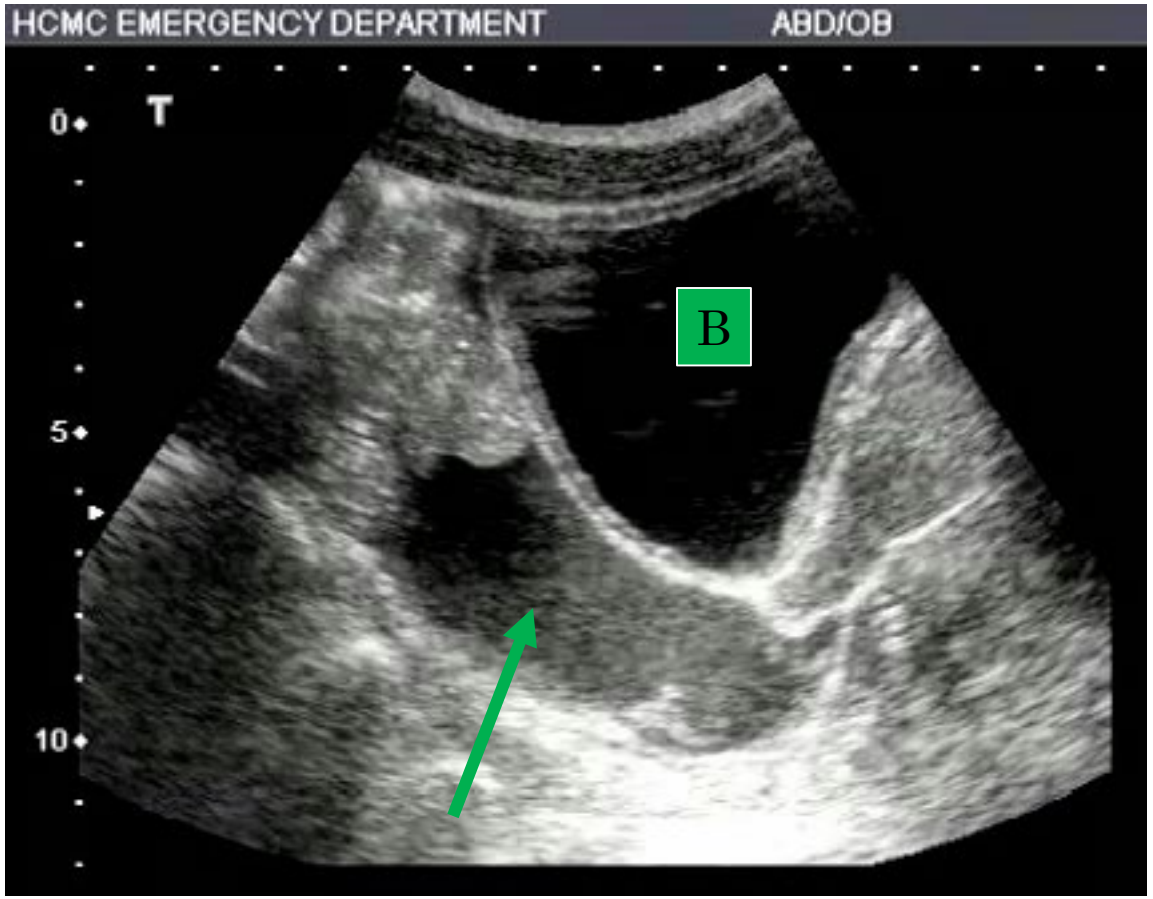
Pouch of Douglas (Females) – Posterior to uterus

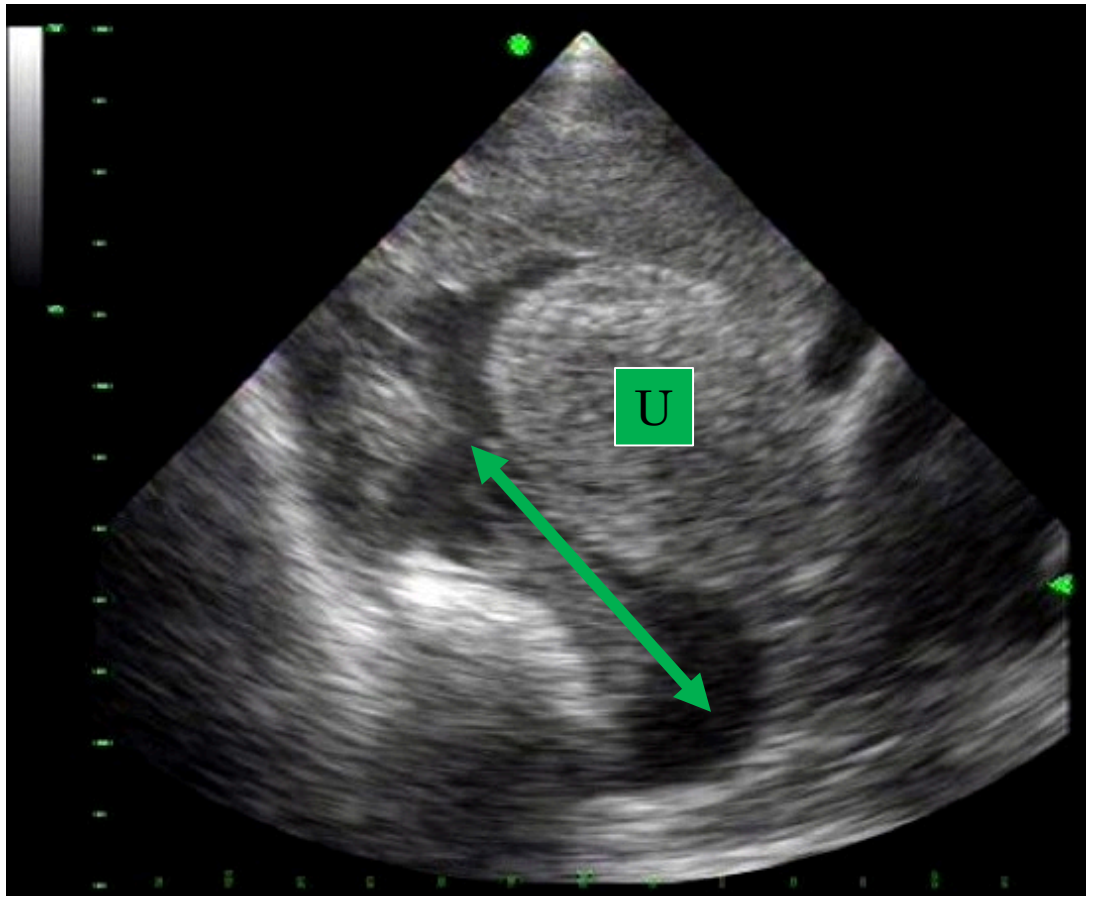
Retrovesicular pouch (Males) – Between bladder and rectum

Suprapubic window
Positive Exam - Male



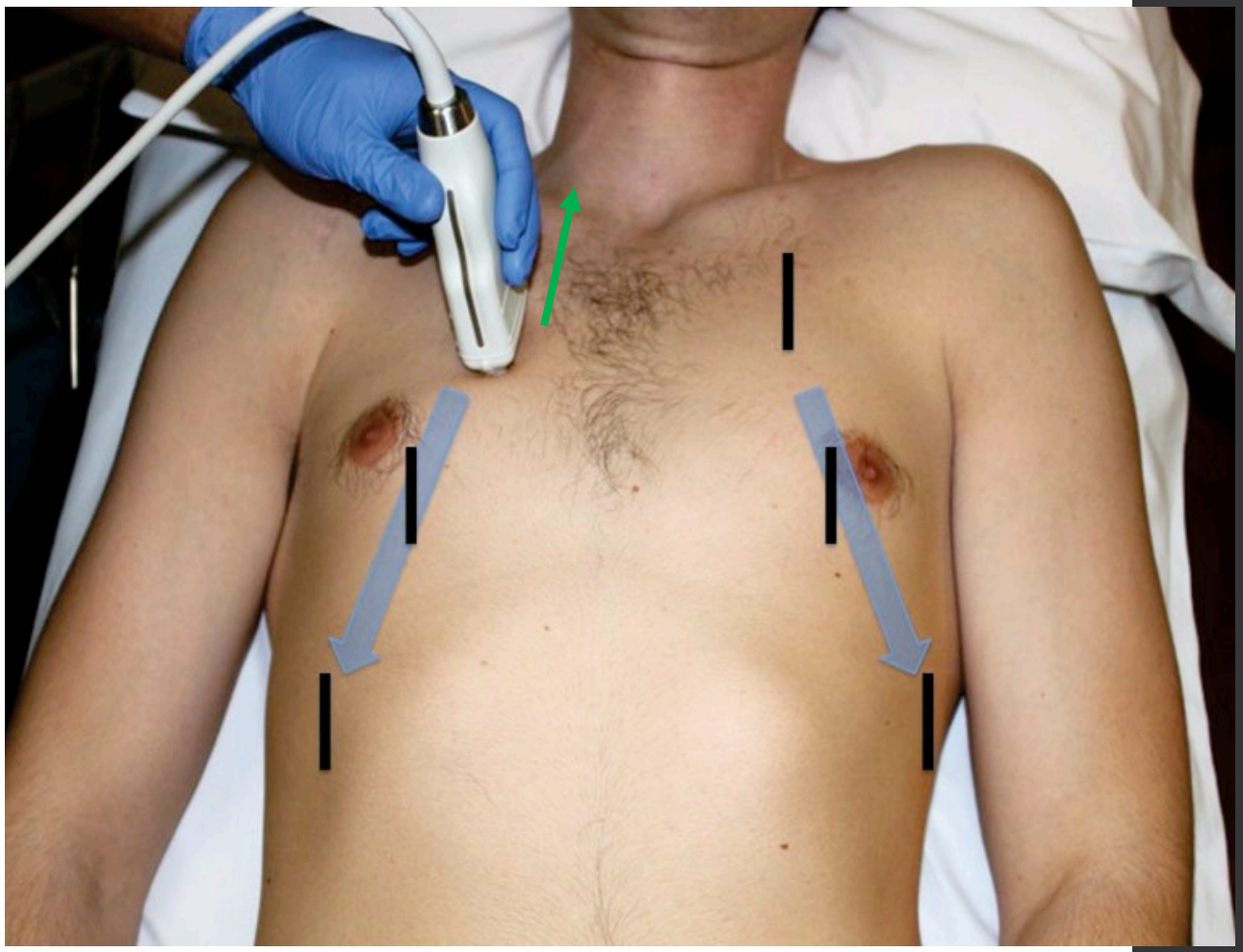
Suprapubic window
Positive Exam - Female





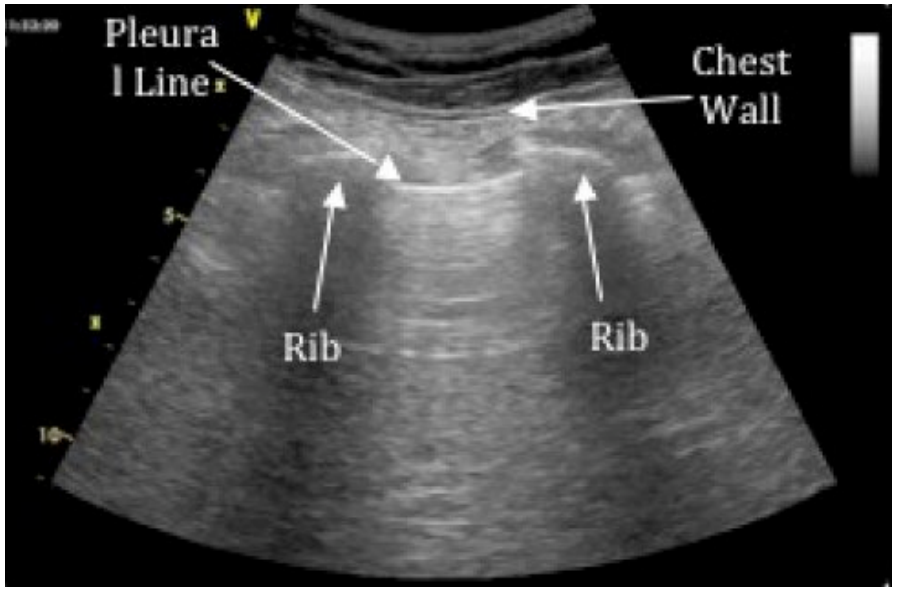
Thorax

- Probe placement
  - Linear probe for best image quality
  - If using the curvilinear probe, decrease depth to <10 cm
  - Sagittal probe orientation with marker towards head
  - Start midclavicular line, 3rd or 4th intercostal space
  - Scan multiple spots on each side



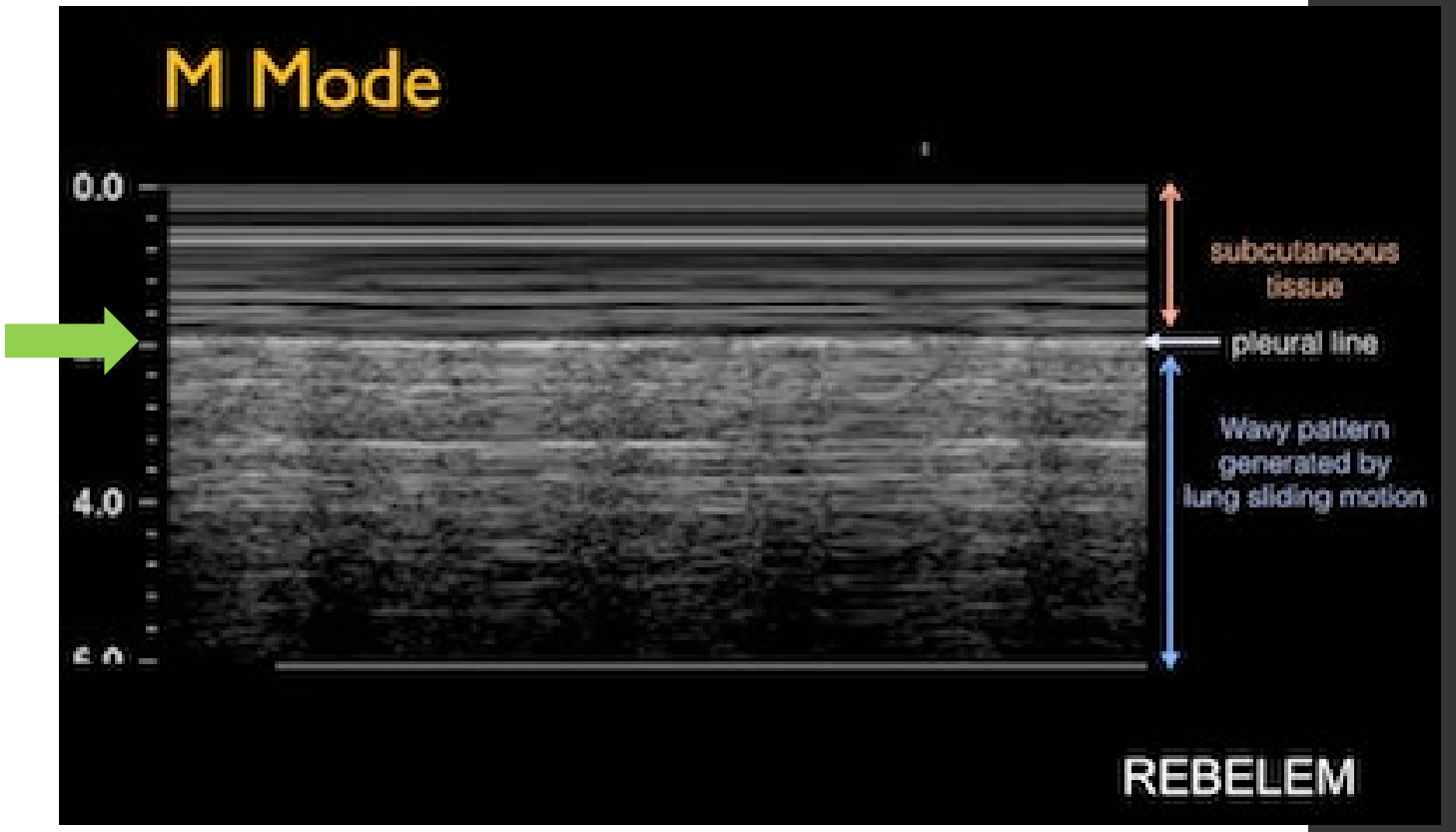
Thorax

- Structures to identify
  - Pleural line between 2 ribs
  - Lung slide (shimmers, or “ants marching”)



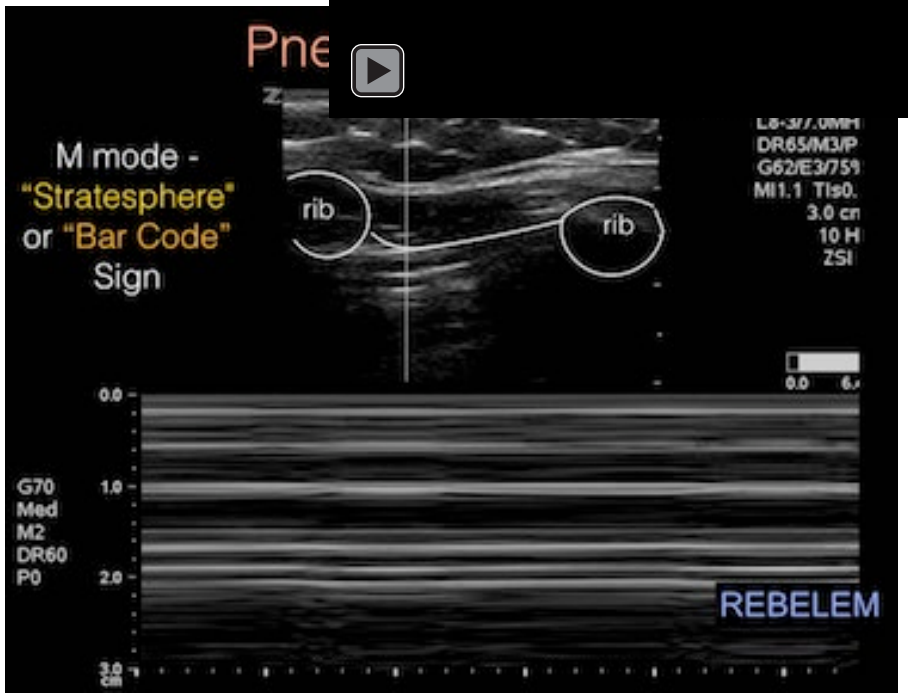
Thorax
Negative eFAST

- Normal lung will create a “sea-shore sign”
- The transition between the “sea” and “shore” is where sliding is detected at the pleural line in M-mode (Green Arrow)

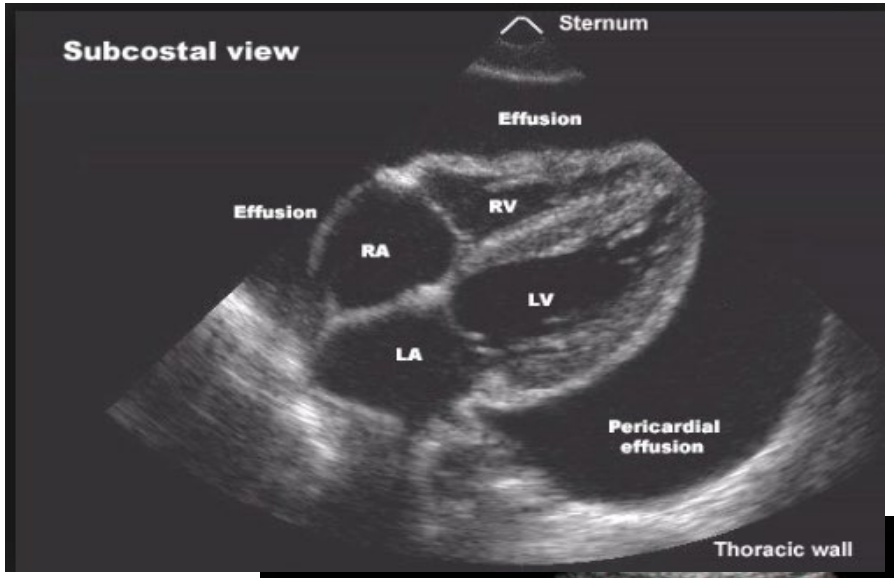


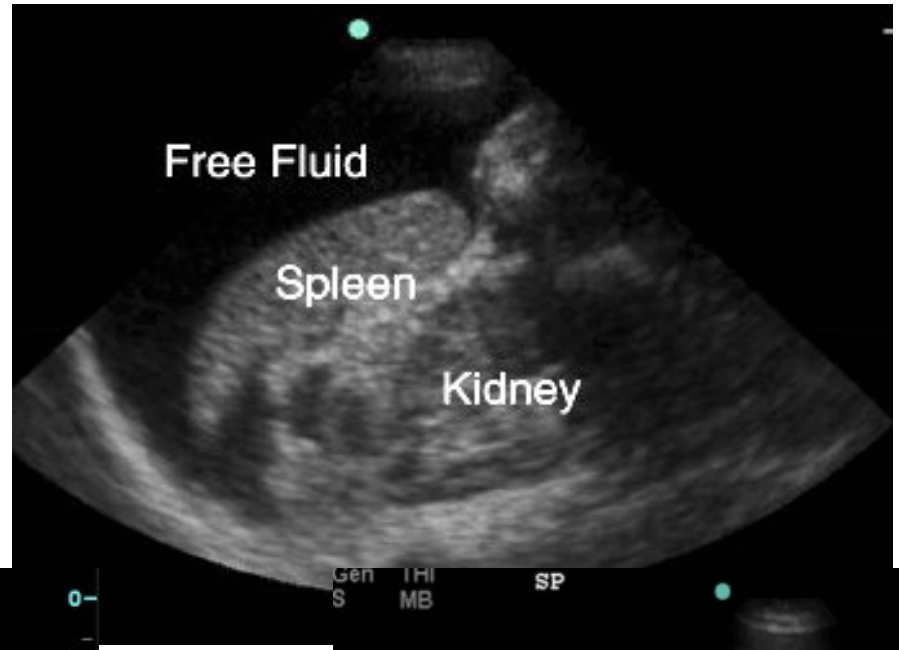
Thorax
Positive eFAST

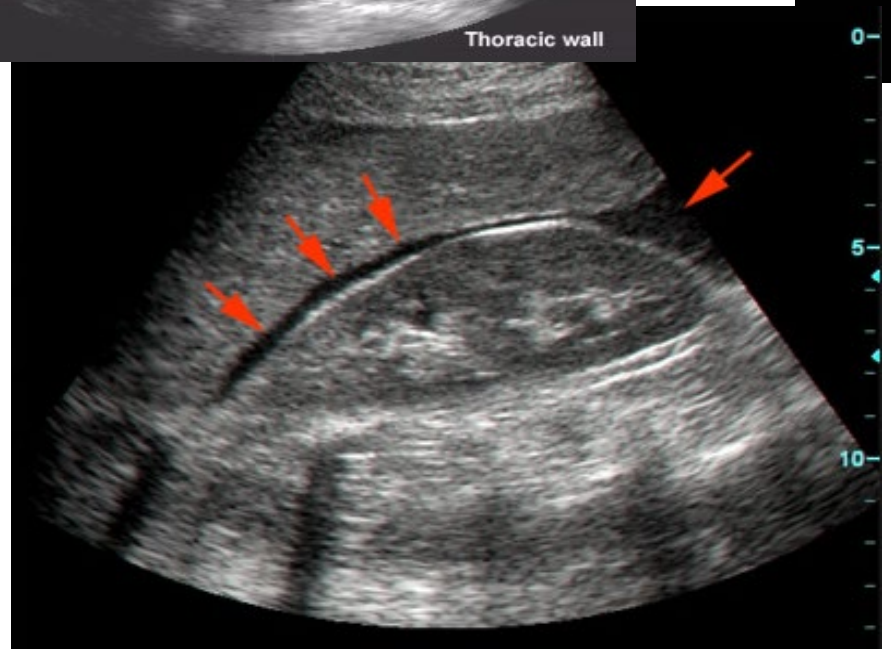
- Findings for pneumothorax
  - Absence of lung slide
  - ”Barcode” or ”stratosphere” sign on M-mode

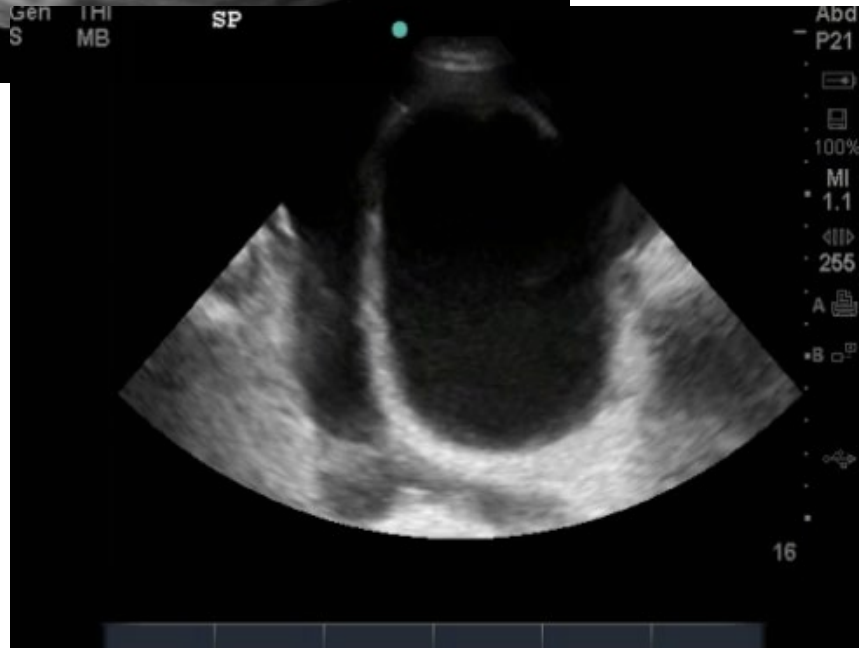


Recognize Abnormals Through Practice!









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