



# FAST Exam

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**Focused Assessment with  
Sonography for Trauma (FAST)**

**E-FAST (extended FAST)**



- 1. Is there free fluid/blood in the abdomen?**
- 2. Is there fluid/blood in the pericardium?**
- 3. Is there fluid/blood in the thorax?**
- 4. Is there a pneumothorax?**

# Introduction

Evaluate a patient adequately and quickly

The FAST protocol was utilized from the mid to late 90s

The addition of the detection of a pneumothorax was included in the eFAST protocol in 2004

**eFAST exam** has largely replaced the **peritoneal lavage**



# Introduction

Adjunct to the primary survey (**c**irculation)

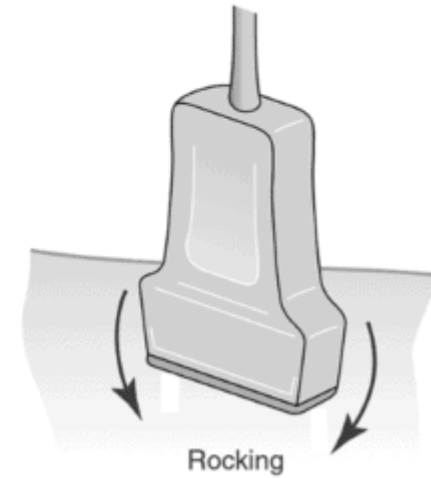
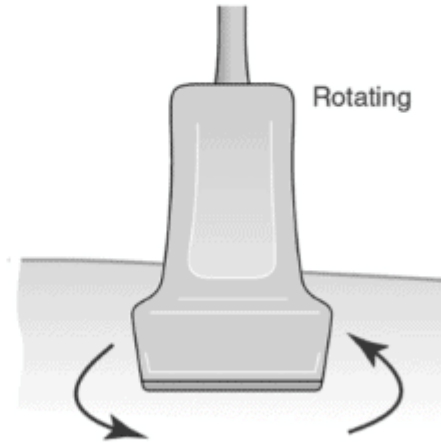
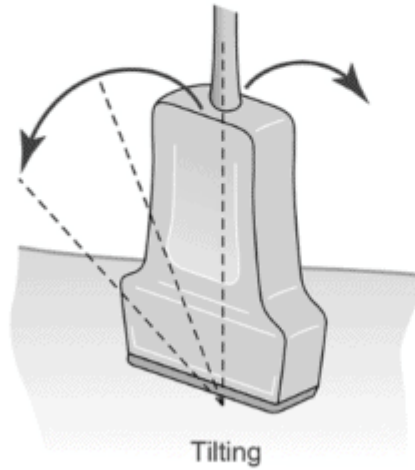
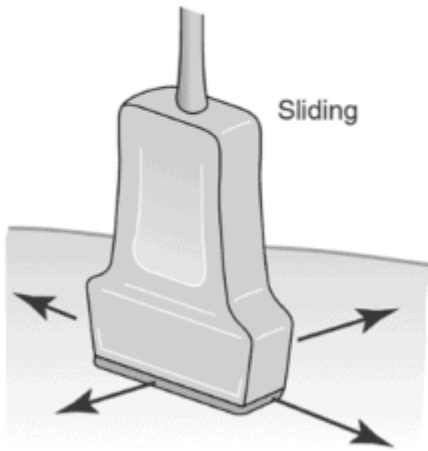
It relies on the principle that in the supine patient, **free fluid such as blood collects in certain anatomical sites**

# Echogenicity

- **Hyperechoic** Brighter
- **Hypoechoic** Darker
- **Anechoic** Structures appear black, meaning no internal echoes.

Blood and free fluid appear anechoic

## Cardinal Transducer Manipulation/Movement (Sliding, Tilting, Rotating, and Rocking)





# Note

## False Negative:

- Very **early scan** (insufficient intra-abdominal blood may not have collected in the dependent areas)
- Occasionally a **late scan** (clotted blood is of similar echogenicity to liver and may not be easily identified in Morison's pouch)



Positive FAST in the RUQ view demonstrating echogenic clot in Morison's pouch with adjacent anechoic free fluid (\*)

# Note

## False Negative:

If the patient is **obese** or if **subcutaneous emphysema** is present also false negative examinations can occur

# Limitation

FAST cannot determine the following:

- Source of free fluid
- Nature of free fluid eg. blood versus ascites
- Presence of solid organ or hollow viscus injury
- Presence of retroperitoneal injury



# Equipment



# Equipment



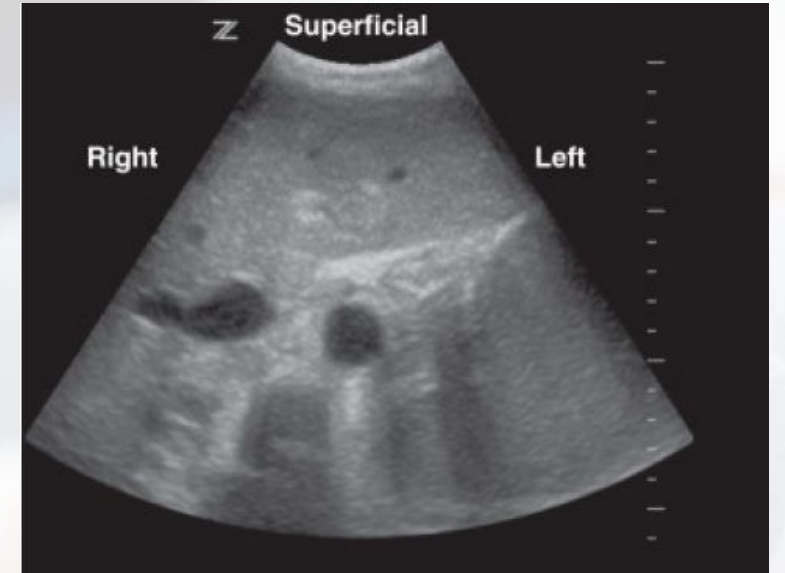
Curvilinear transducer  
Linear transducer

# Equipment



Holding the probe

# Equipment



Probe and screen markers



# Probe position



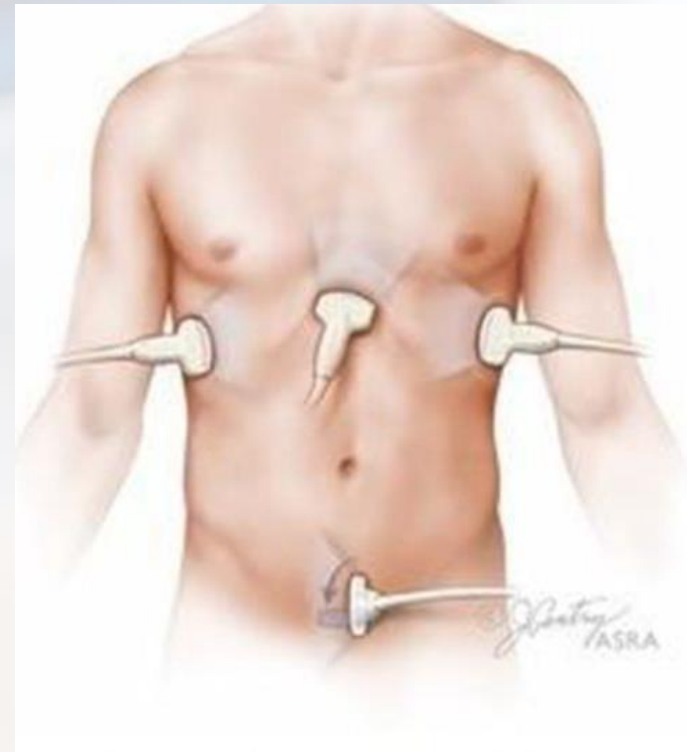
Longitudinal probe position



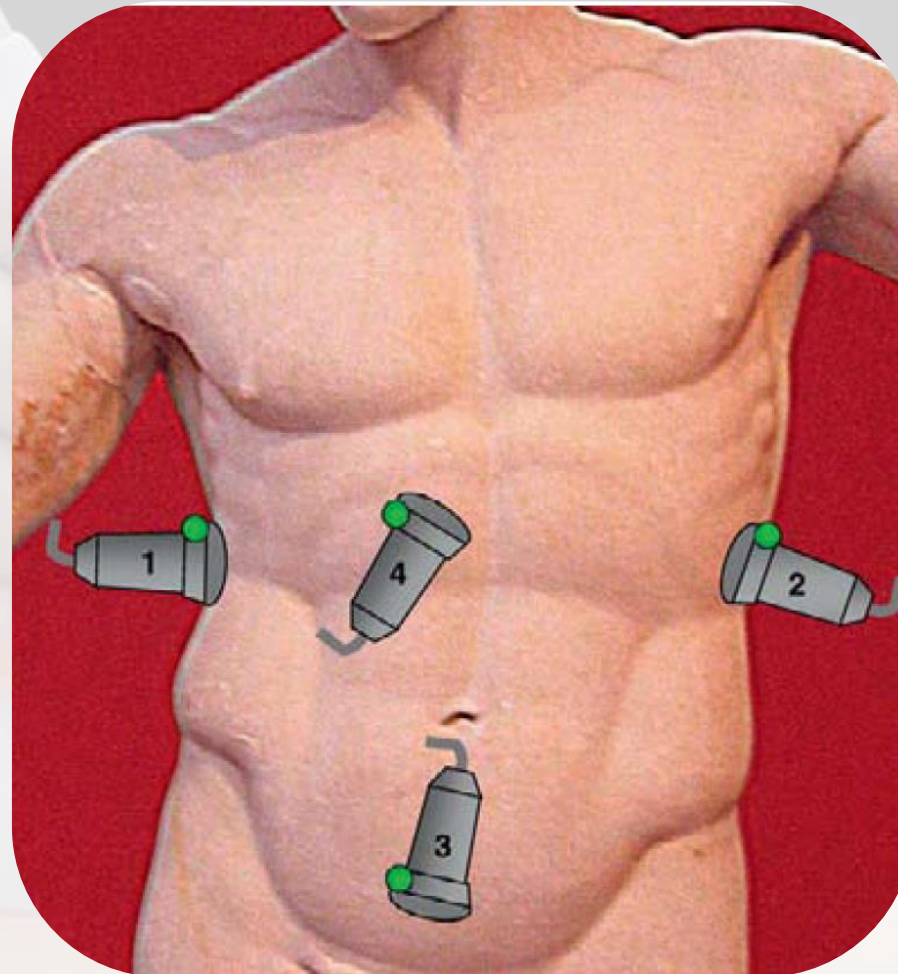
Transverse probe position

# Patient Position

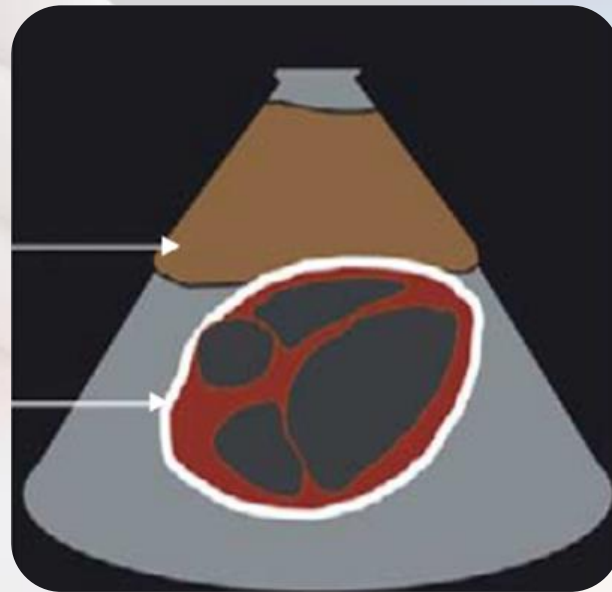
**Supine position** with arms abducted slightly or above the head



# The 4 Views of FAST



# 1. Subxifoid view



# 1. Pericardium: subxiphoid view

## Transducer:

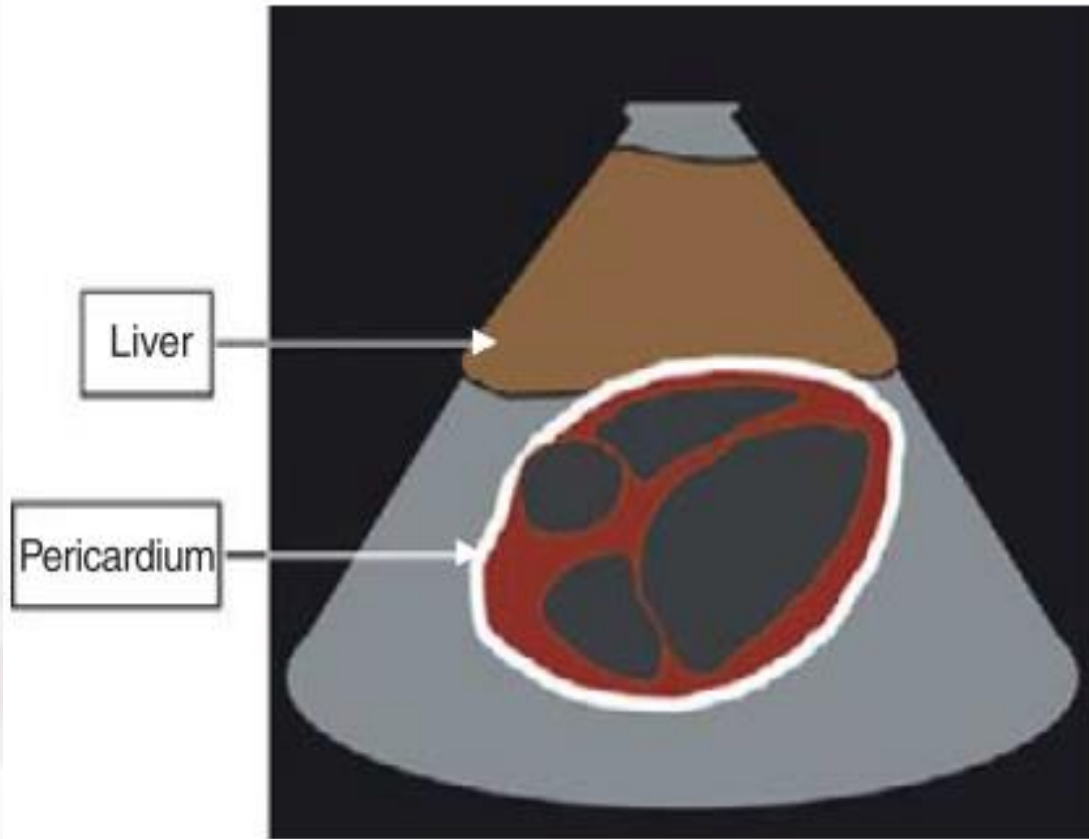
- Transvers
- Marker to Right
- Direct toward left shoulder
- May need to increase depth
- Liver as Acoustic Window

## Review

- Effusion Around heart



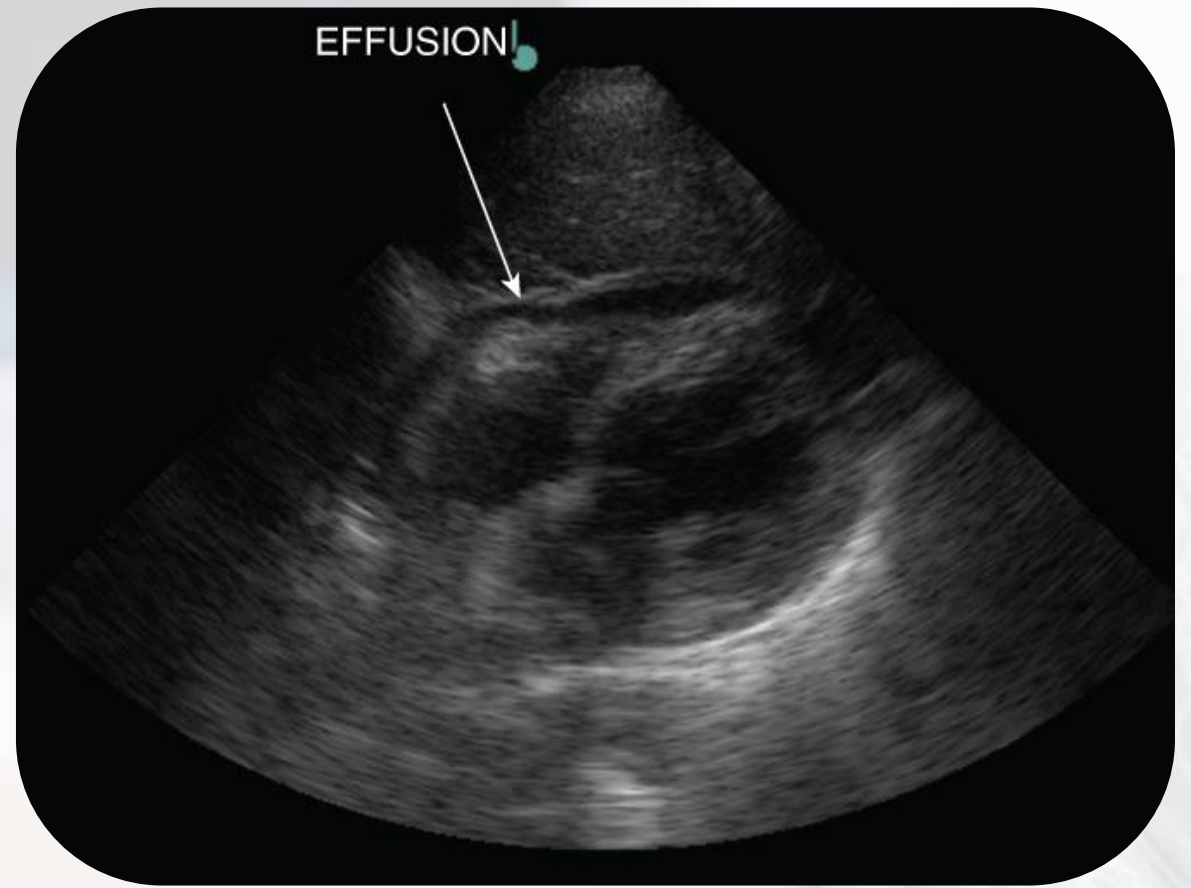
# Subxifoid view



## Normal subxiphoid view

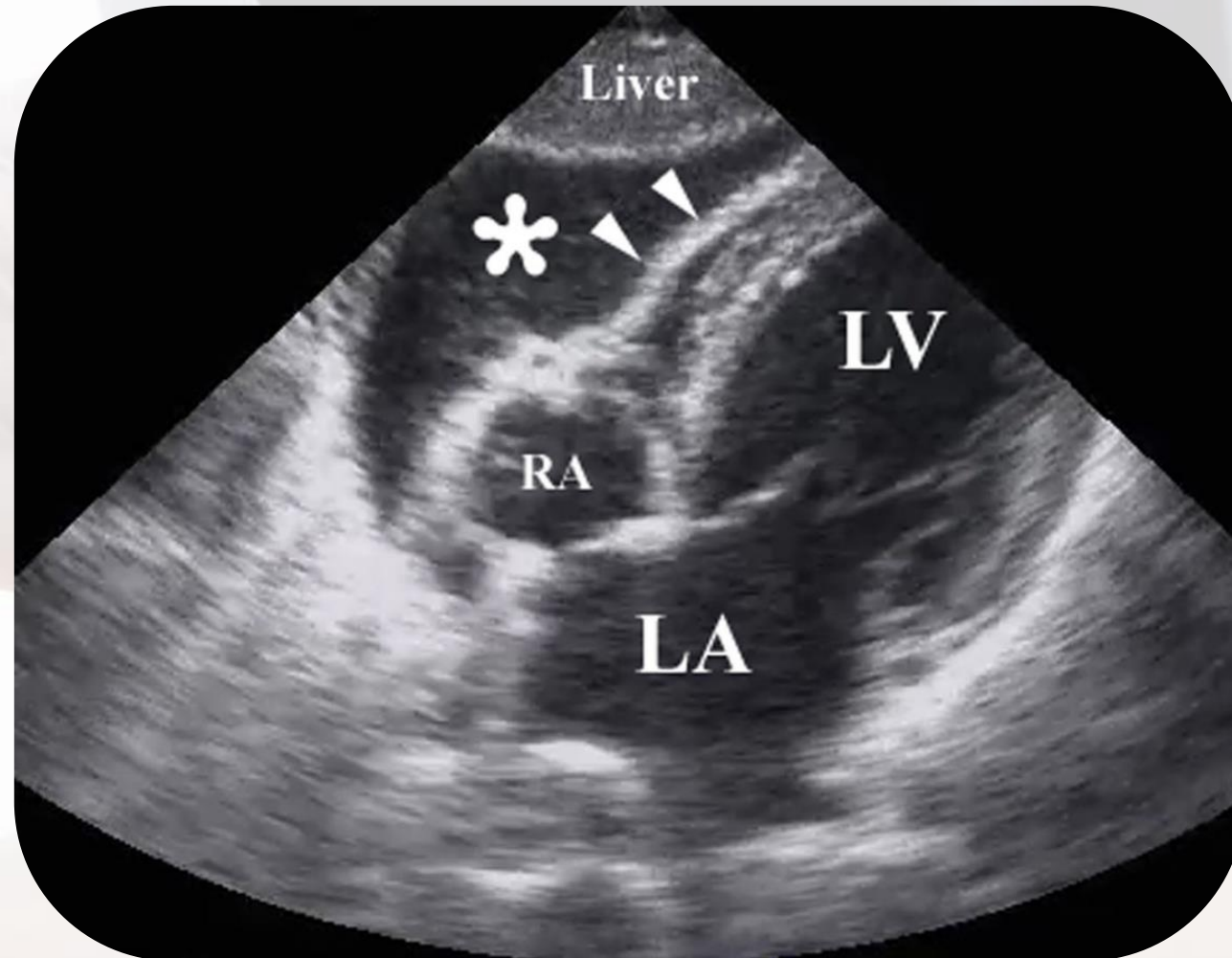


# Free fluid in pericardium

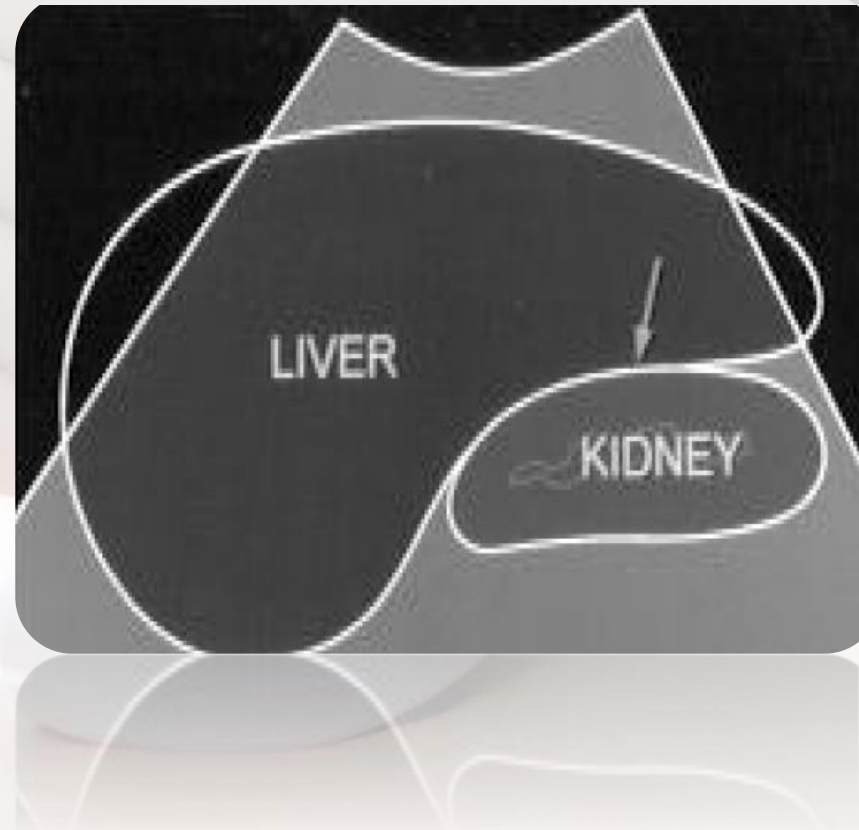




# Free fluid in pericardium



## 2.Right upper quadrant



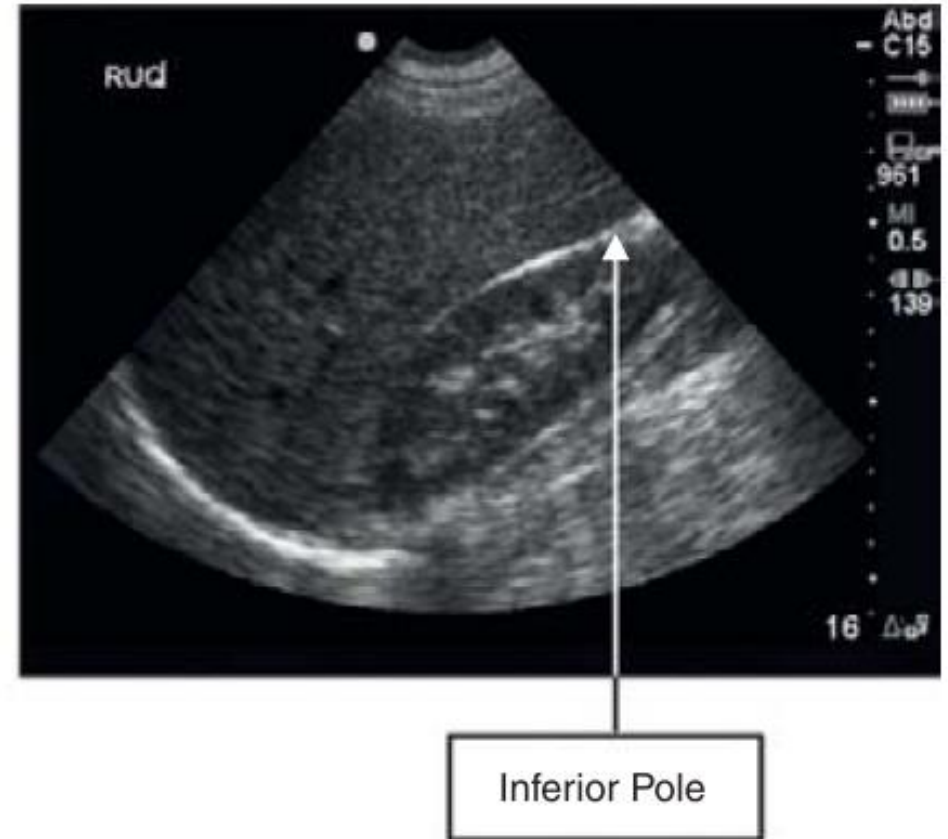
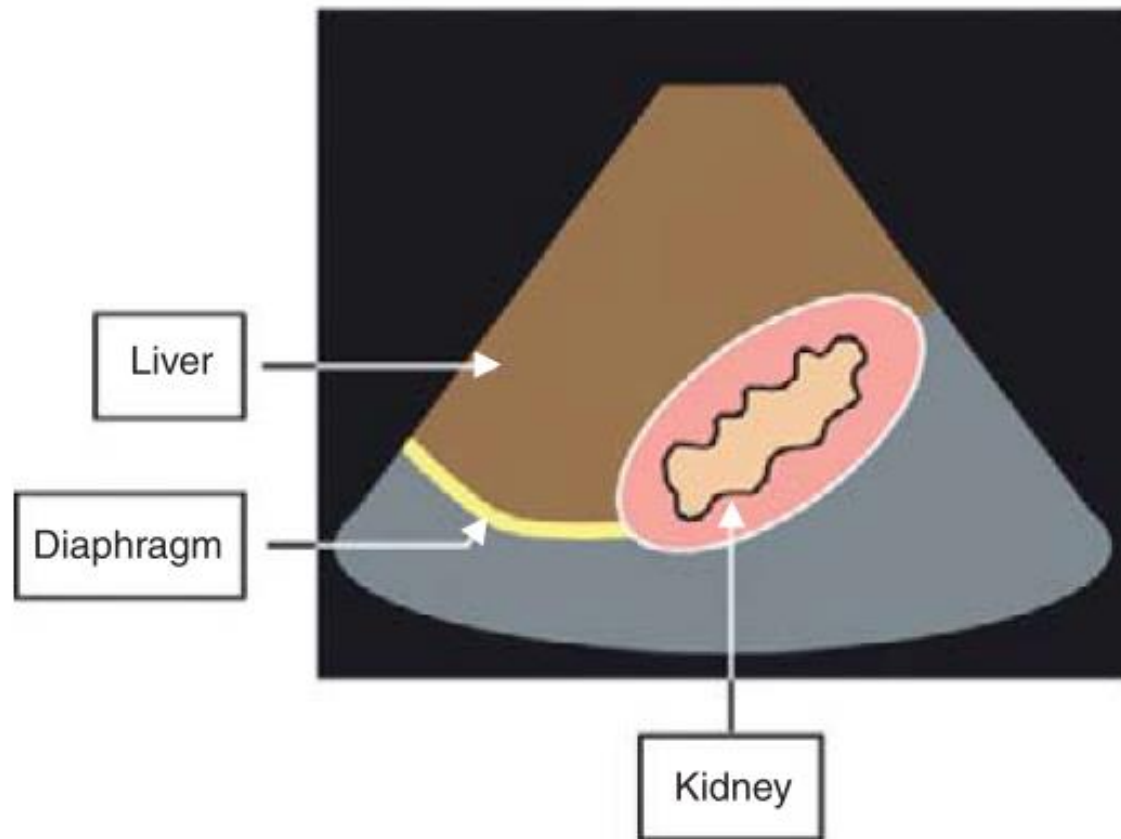
## 2. Right upper quadrant view (RUQ):

### Transducer:

- longitudinally
- Midaxillary line
- Lower ribs
- Morrison's pouch is usually best imaged between rib 8-11
- Marker toward patients head
- Slide, Rotate, Fan



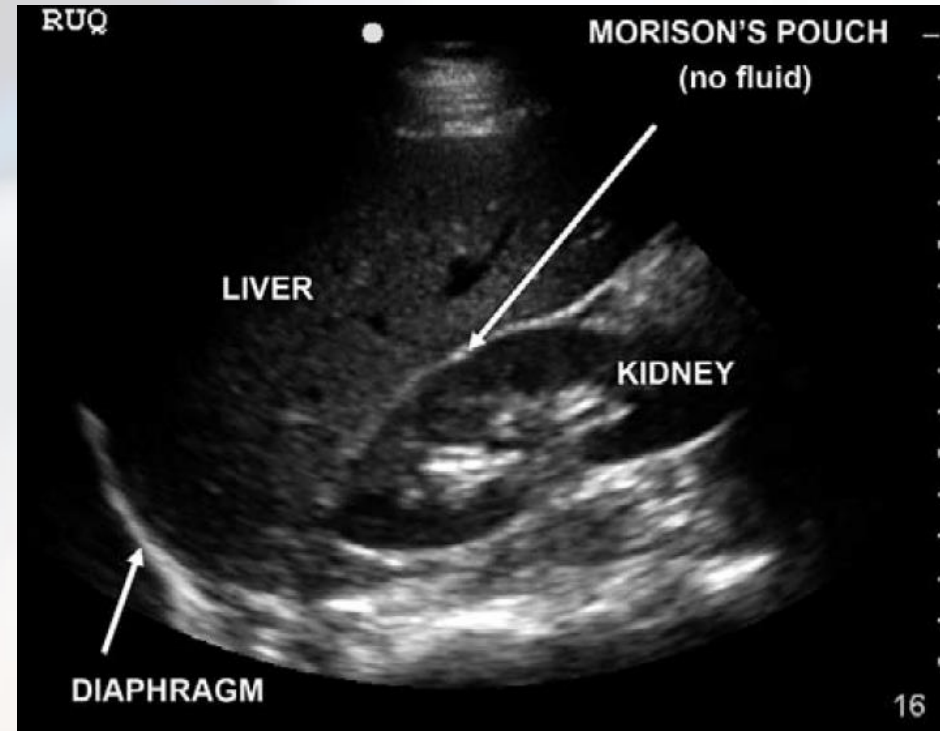
# RUQ



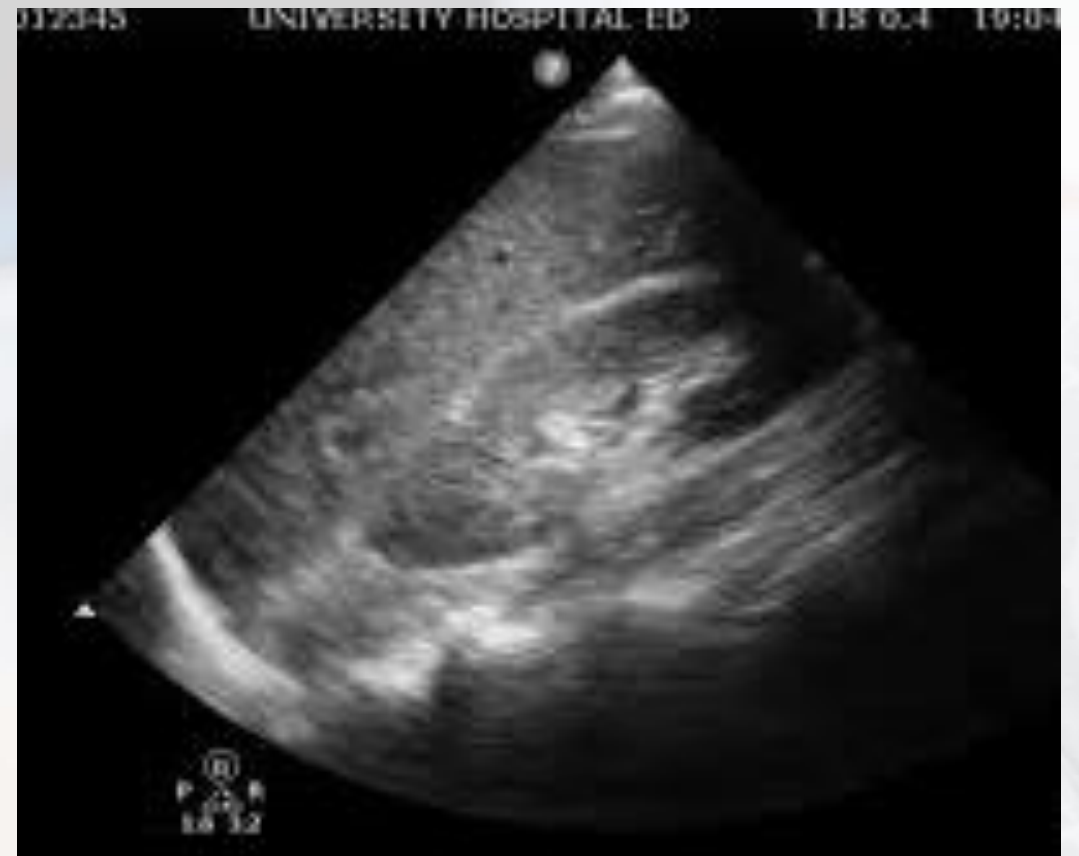
# Right upper quadrant view

Review 5 area:

- Hepatorenal recess
- Inferior pole of kidney (Right paracolic gutter)
- Tip of liver
- Below Diaphragm
- Pleural Cavity

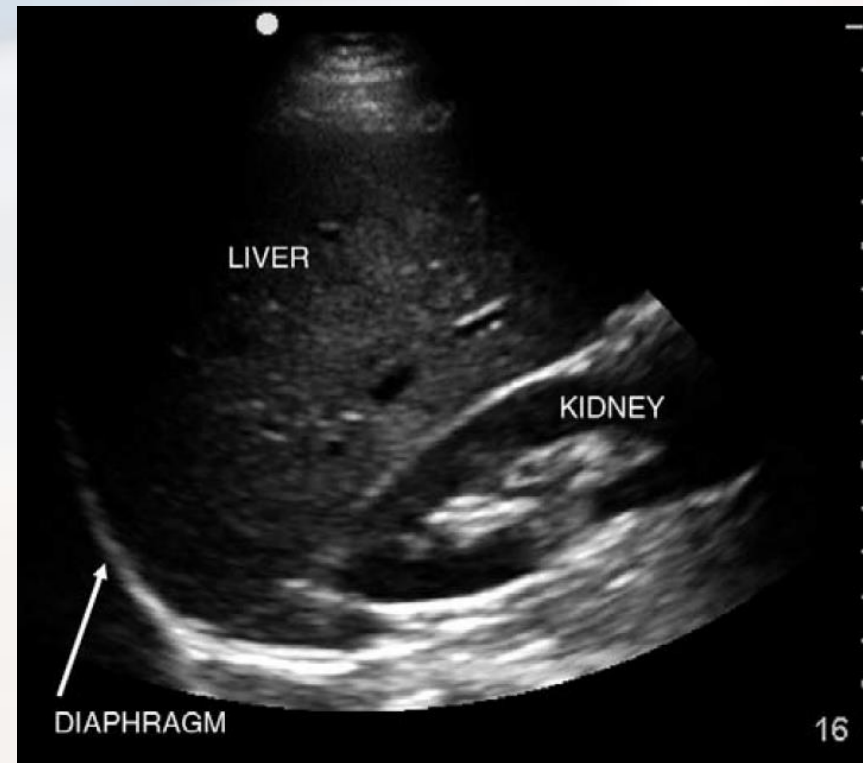
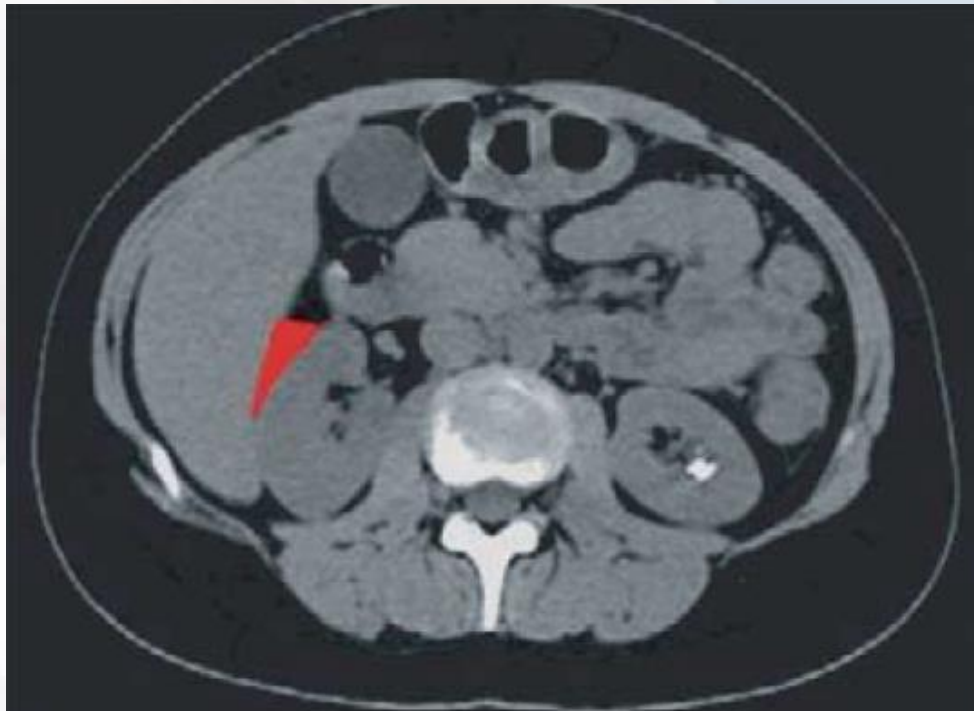


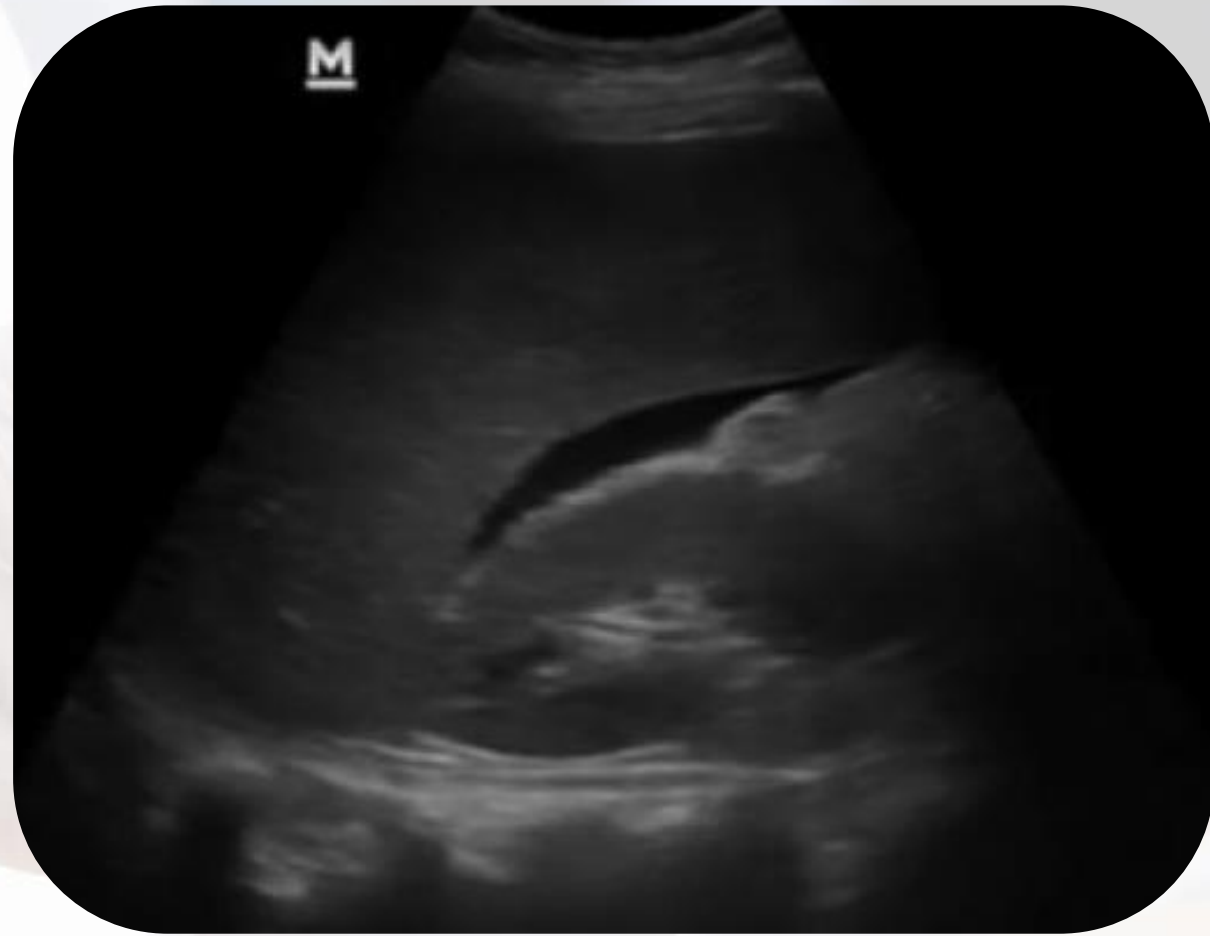
# Normal view of RUQ



# Hepatorenal recess (Morison's pouch)

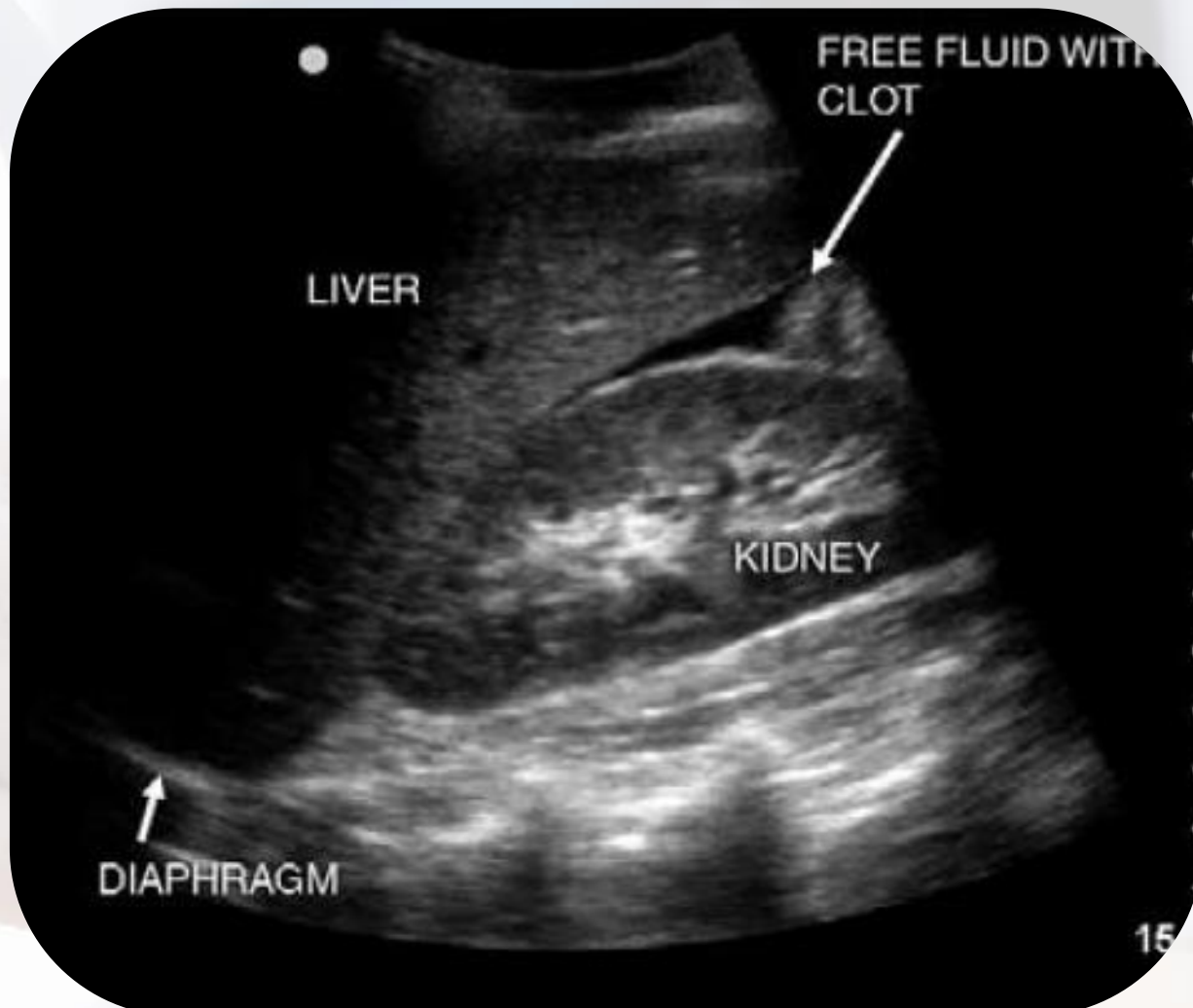
The potential space located in RUQ between Glisson's capsule of the liver and Gerota's fascia of the right kidney





**Free Fluid in the hepatorenal recess (Morison's pouch)**



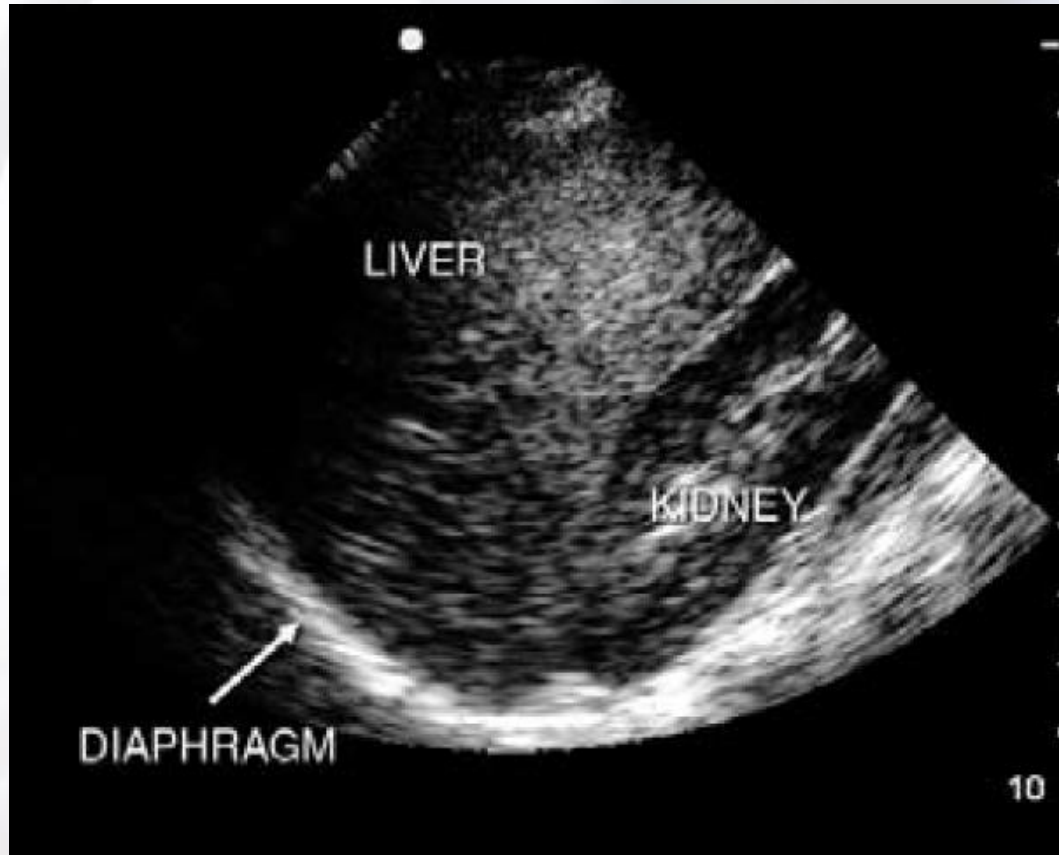


**Fluid stripe in Morison's pouch  
The heterogeneous echogenic material at the inferior pole of the  
kidney suggests clot**

# Inferior pole of kidney

Do not forget to visualize the **inferior pole!**

In a supine patient, the inferior pole of the kidney on both right and left upper quadrant views is the most posterior or **dependent part of the peritoneal cavity**

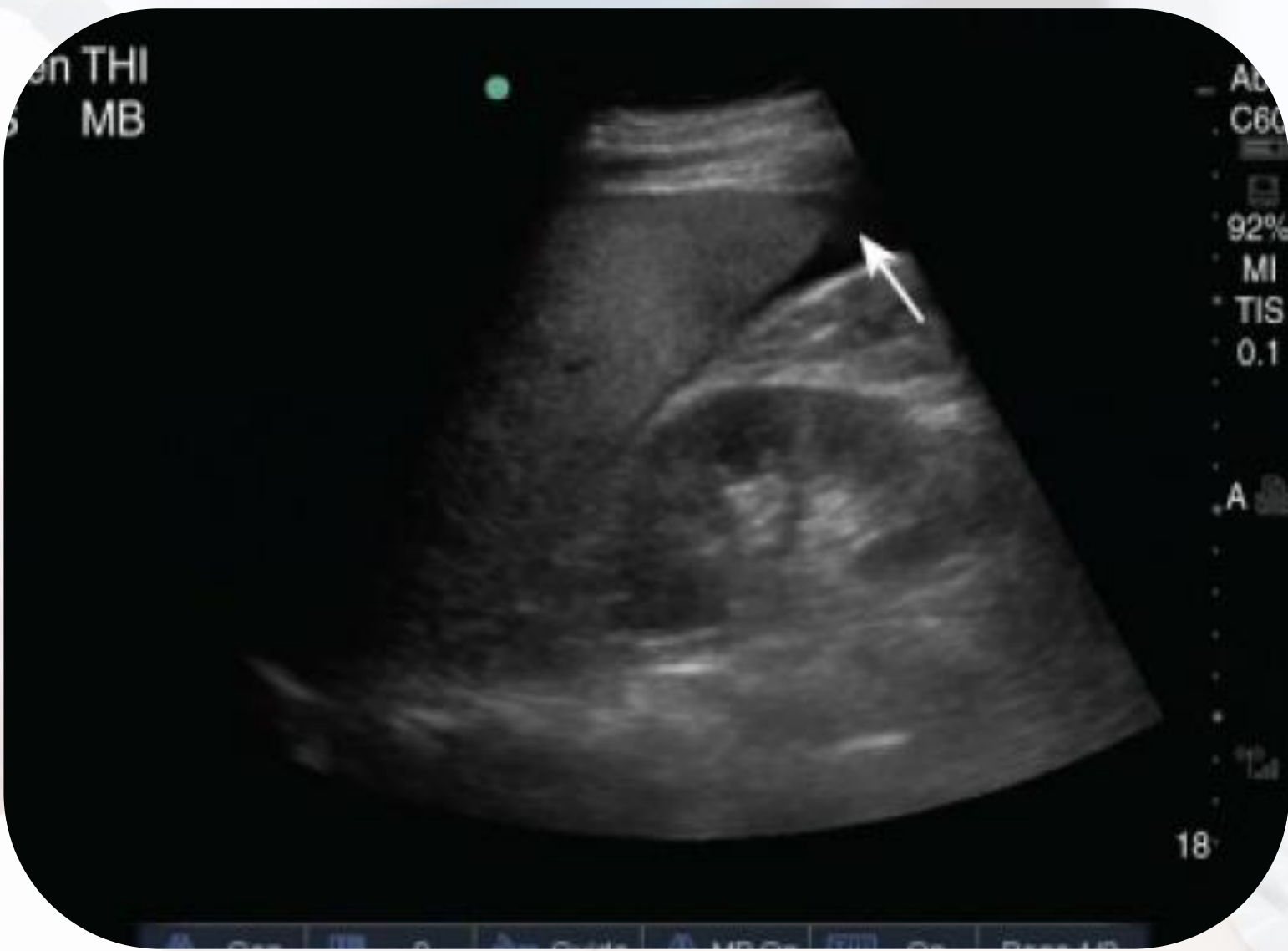


Positive FAST. (A and B) Views of Morison's pouch showing fluid along the inferior pole of the right kidney (only visible in B).

# Liver Tip

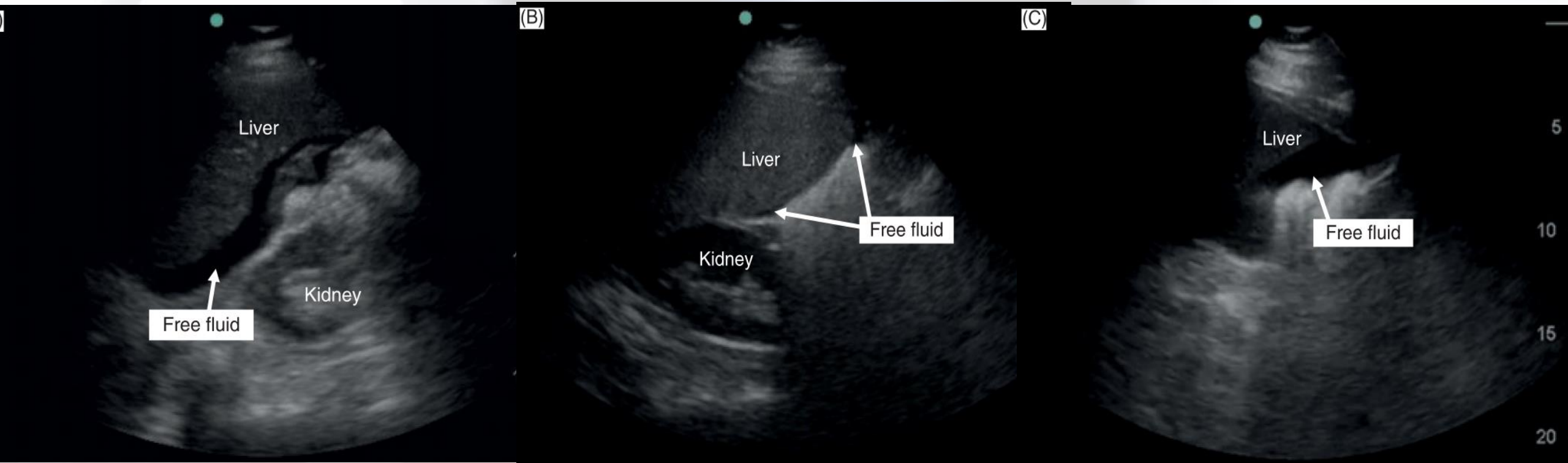
Hemoperitoneum can be detected first around the liver tip; therefore, it is important to image this specific area of the RUQ





Free Fluid (black) seen surrounding the inferior tip of the liver



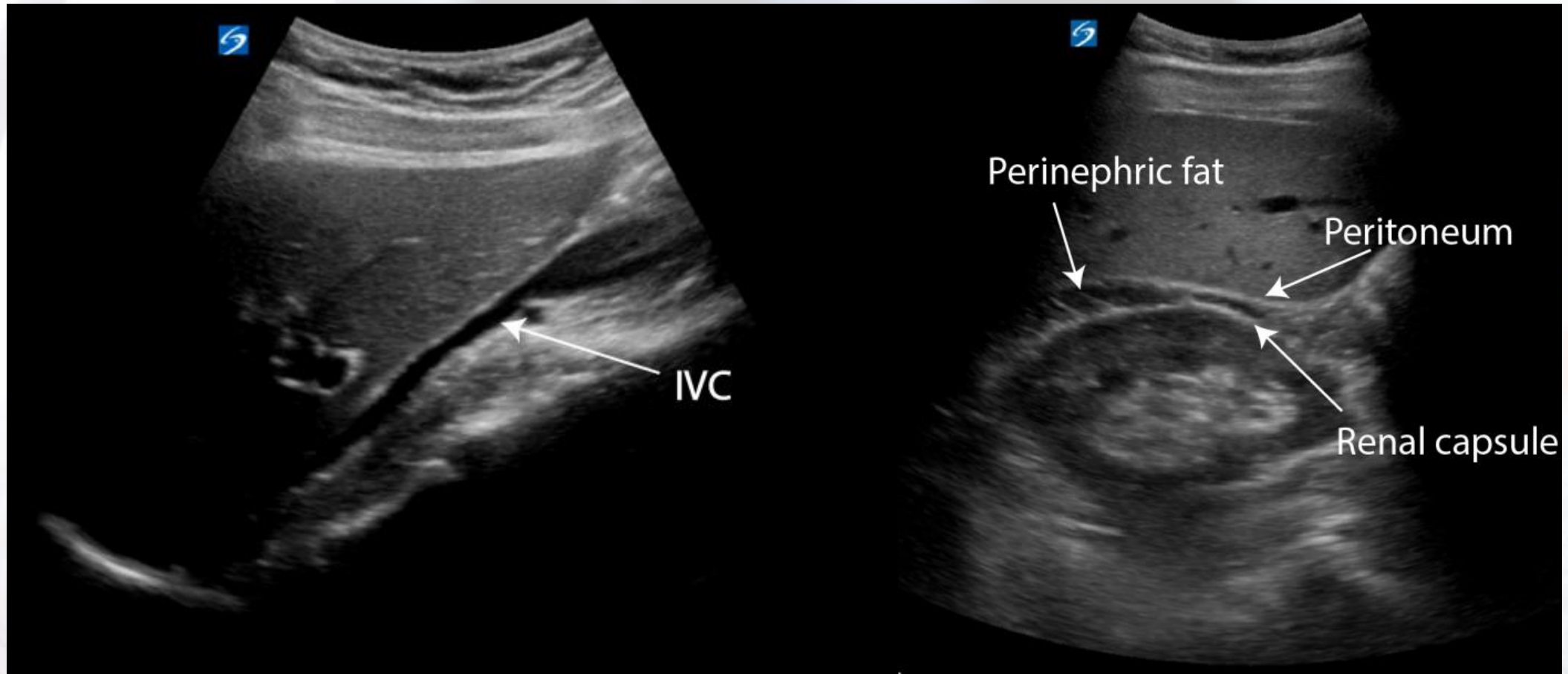


RUQ FAST views of three patients showing the variable appearance of free fluid

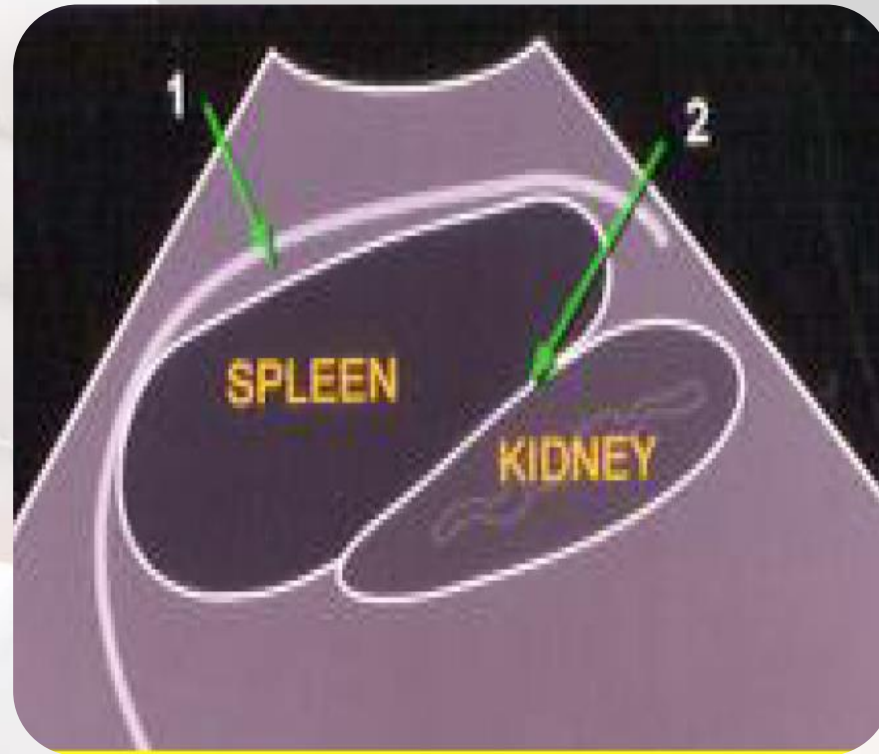
# Question

- **Name 3 false positives when identifying free fluid in the RUQ?**
  1. The gallbladder
  2. Perinephric fat
  3. The inferior vena cava





### 3. Left upper quadrant



## Left upper quadrant:

### Transducer:

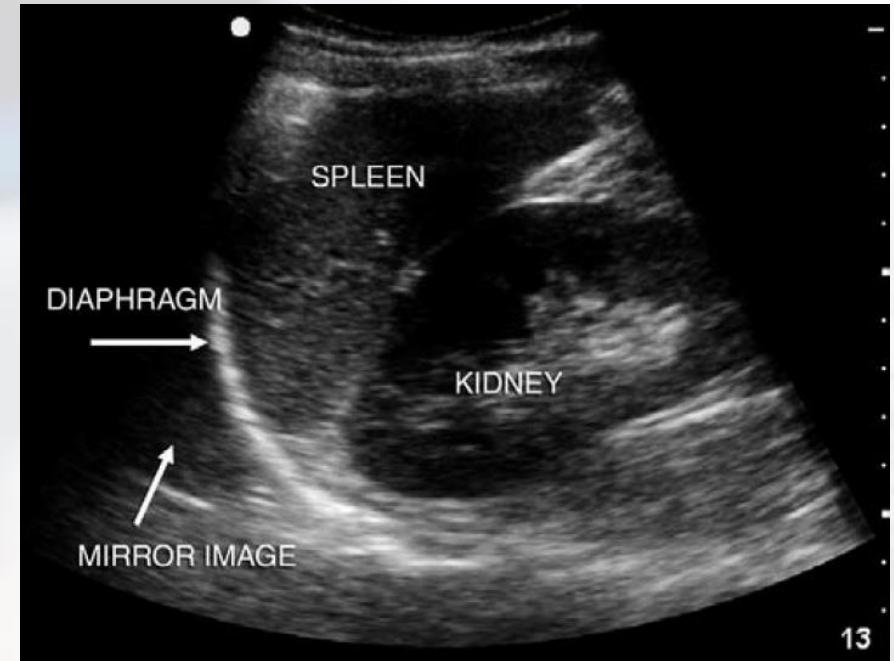
- longitudinally
- More posterior than RUQ  
*Posterior axillary line*
- More Superior than RUQ  
*6-9<sup>th</sup> intercostal space*
- Slide, Rotate, Fan



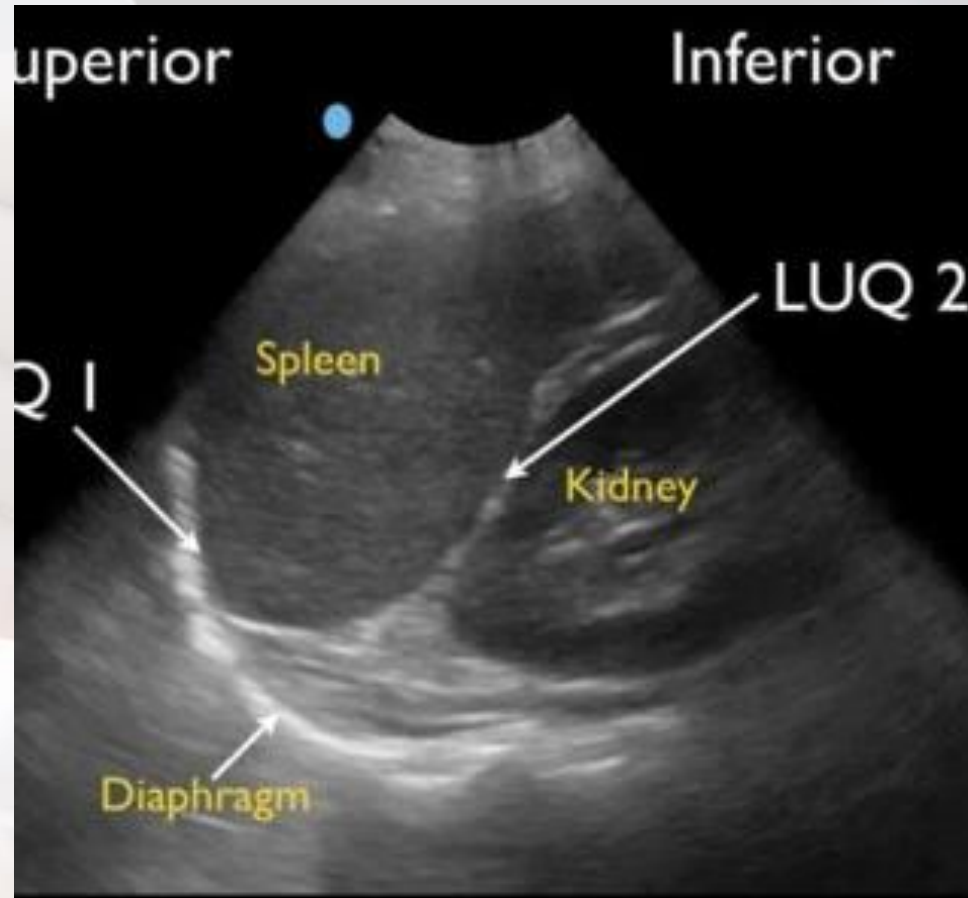
# Left upper quadrant:

Review 4 area:

- Splenorenal recess
- Inferior pole of kidney (Left paracolic gutter)
- Below Diaphragm
- Pleural Cavity

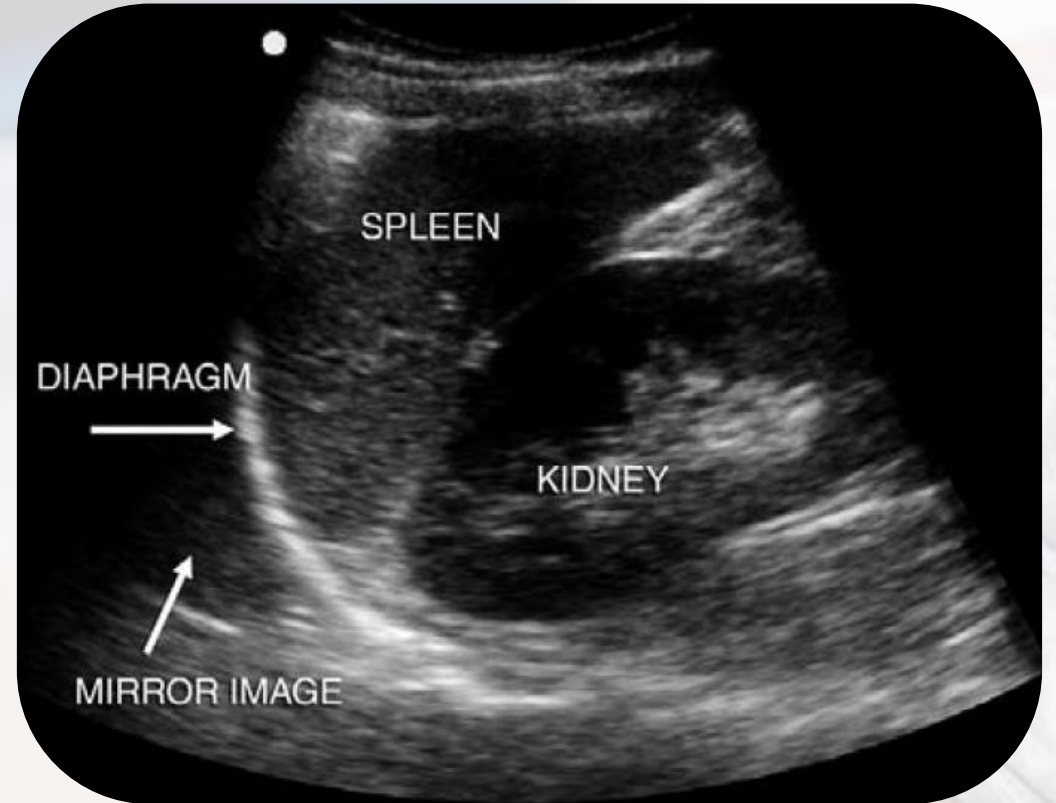


# Normal View of LUQ



# Splenorenal recess

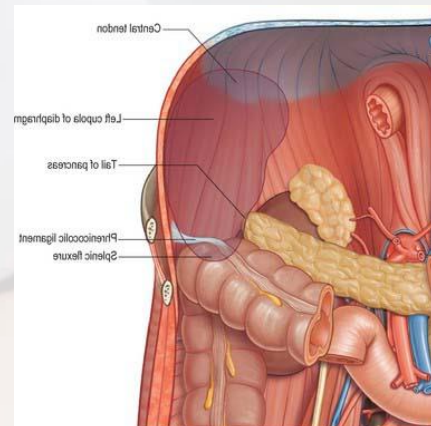
The potential space located in the left upper LUQ between the spleen and Gerota's fascia of the left kidney



# NOTE

The phrenocolic ligament blocks fluid movement to the left paracolic gutter

Fluid flows more freely toward the right paracolic gutter



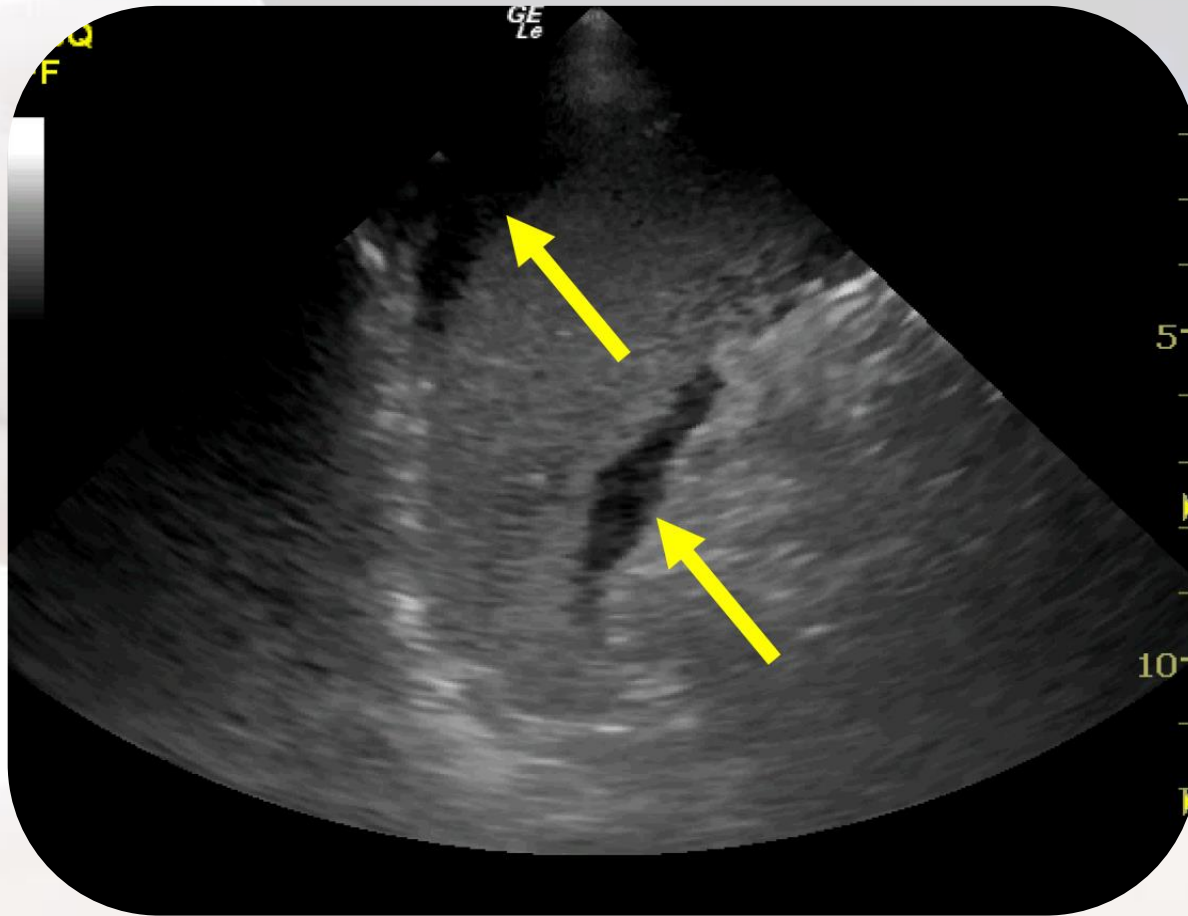
# Note

Blood usually collects in the **subdiaphragmatic space** in the LUQ

looking at the space between the **spleen** and the **diaphragm** is much more likely to yield results than the splenorenal recess

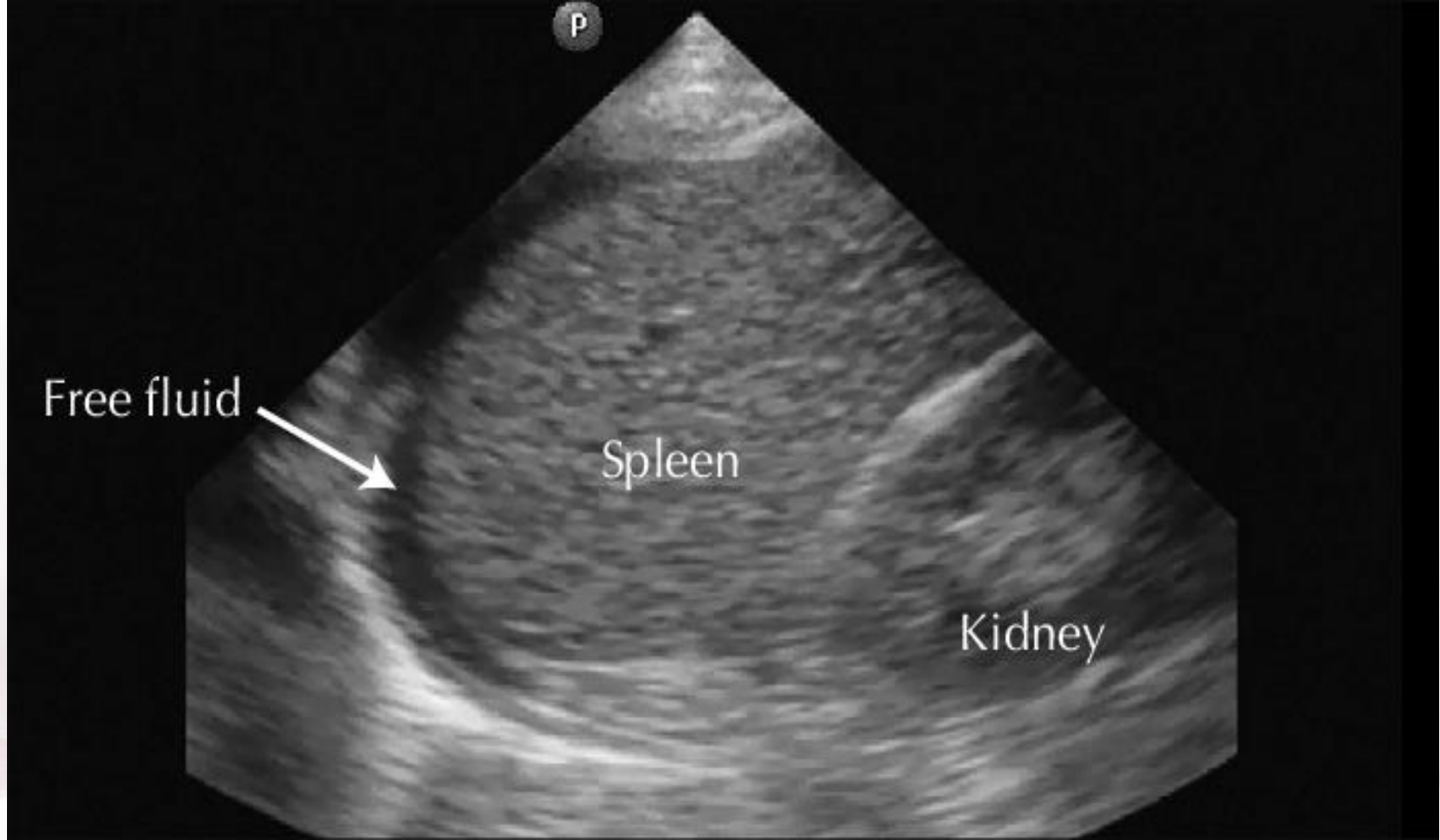


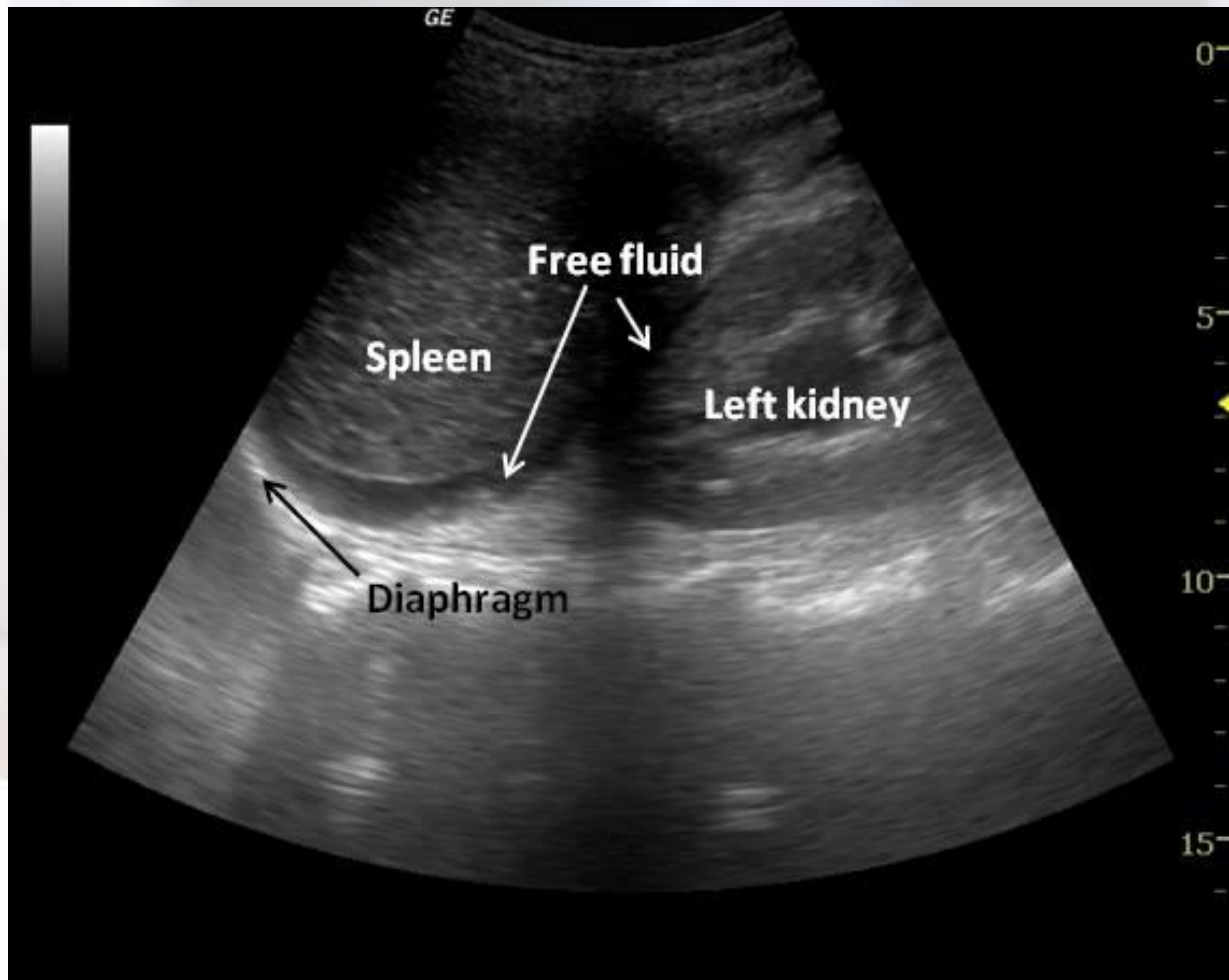
# Free fluid in RUQ

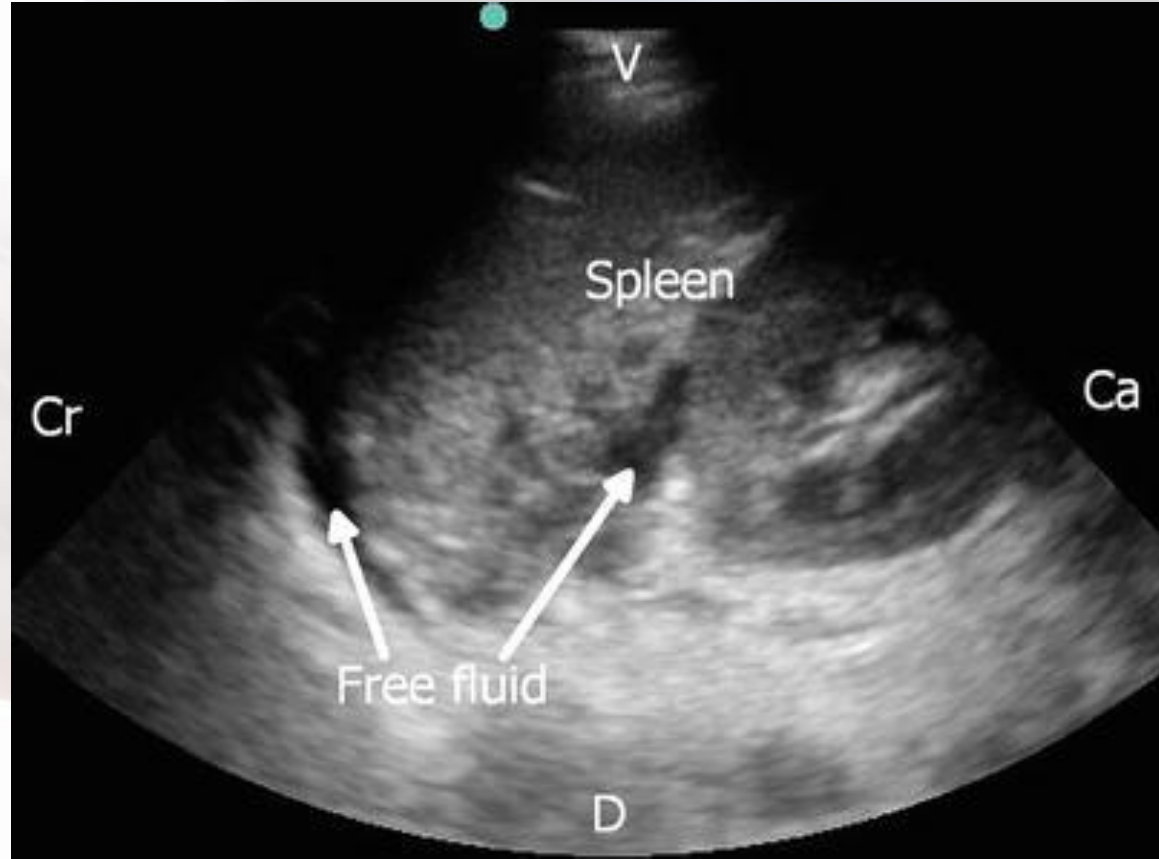




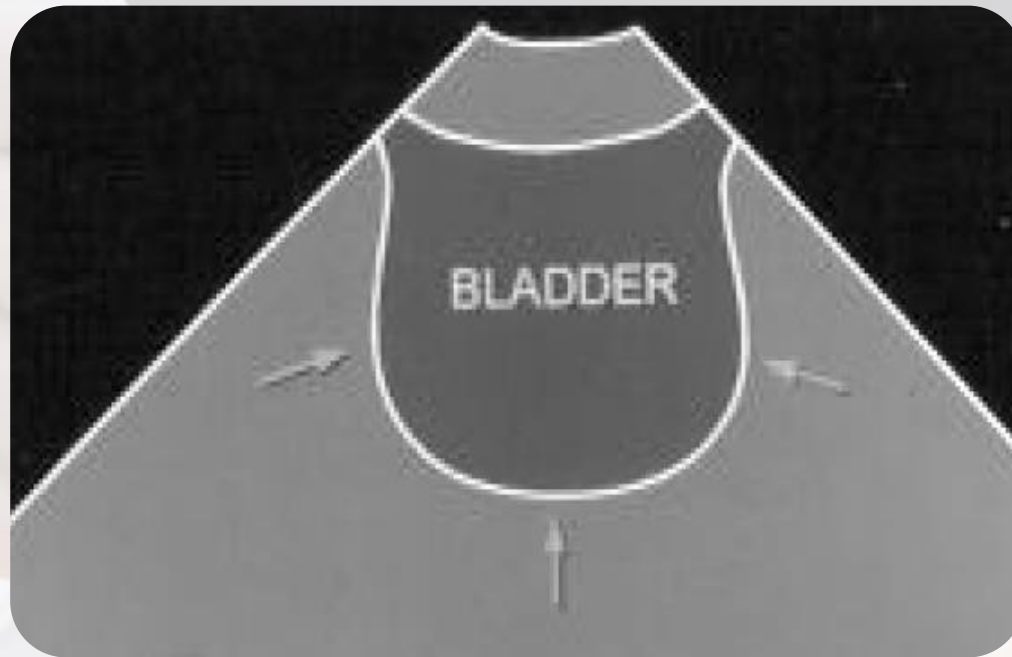
Free fluid in the splenodiaphragmatic space







## 4. Pelvis



# Pelvis: sagittal & transverse



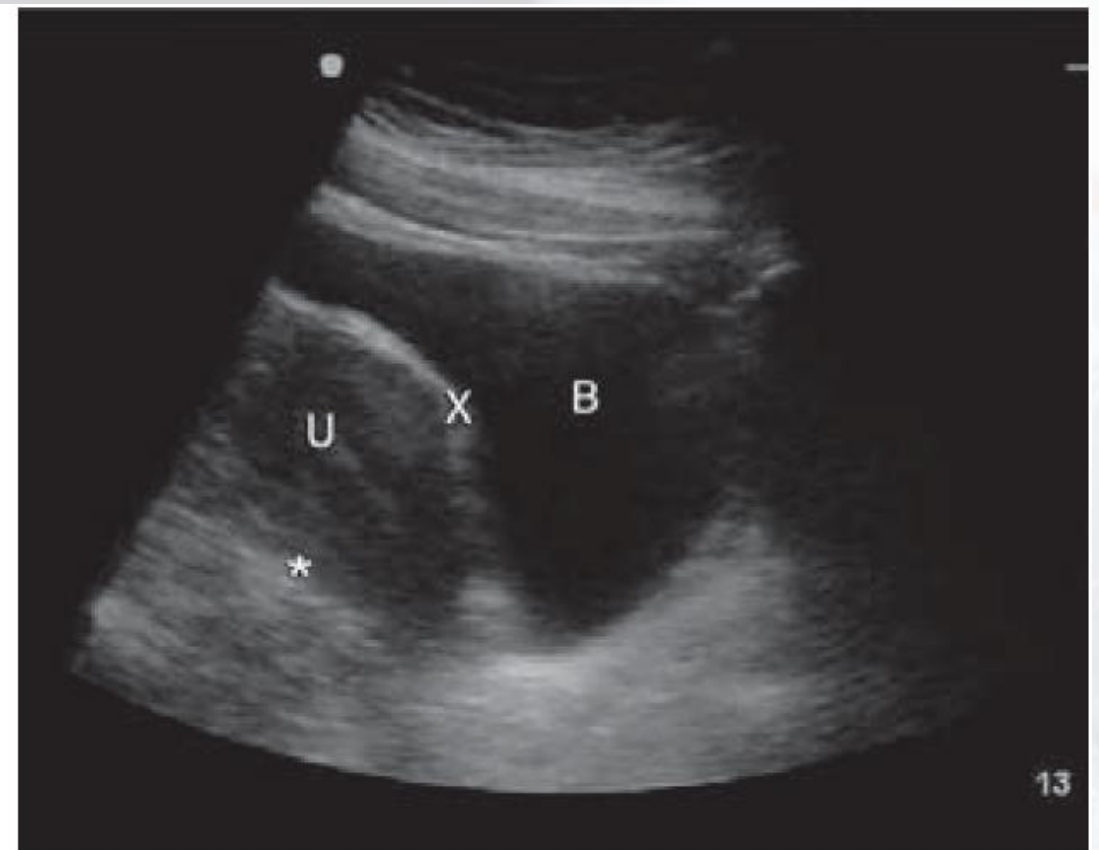
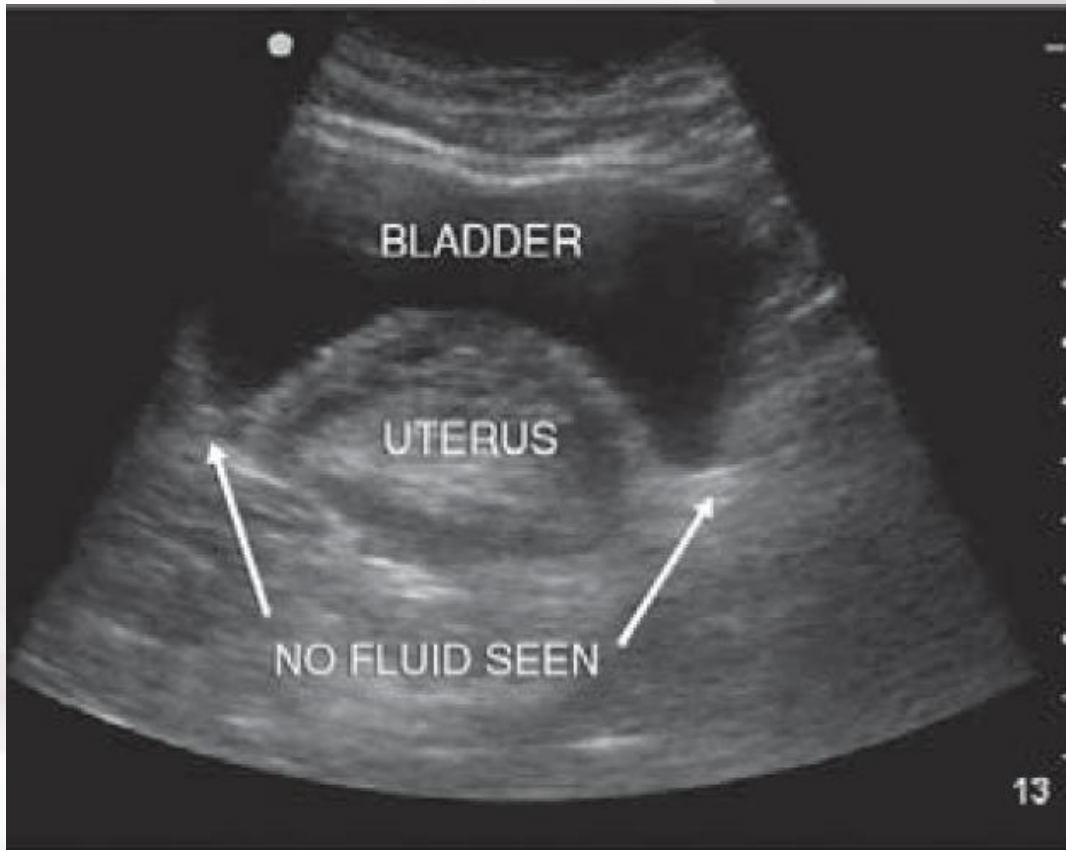


## Pelvis:

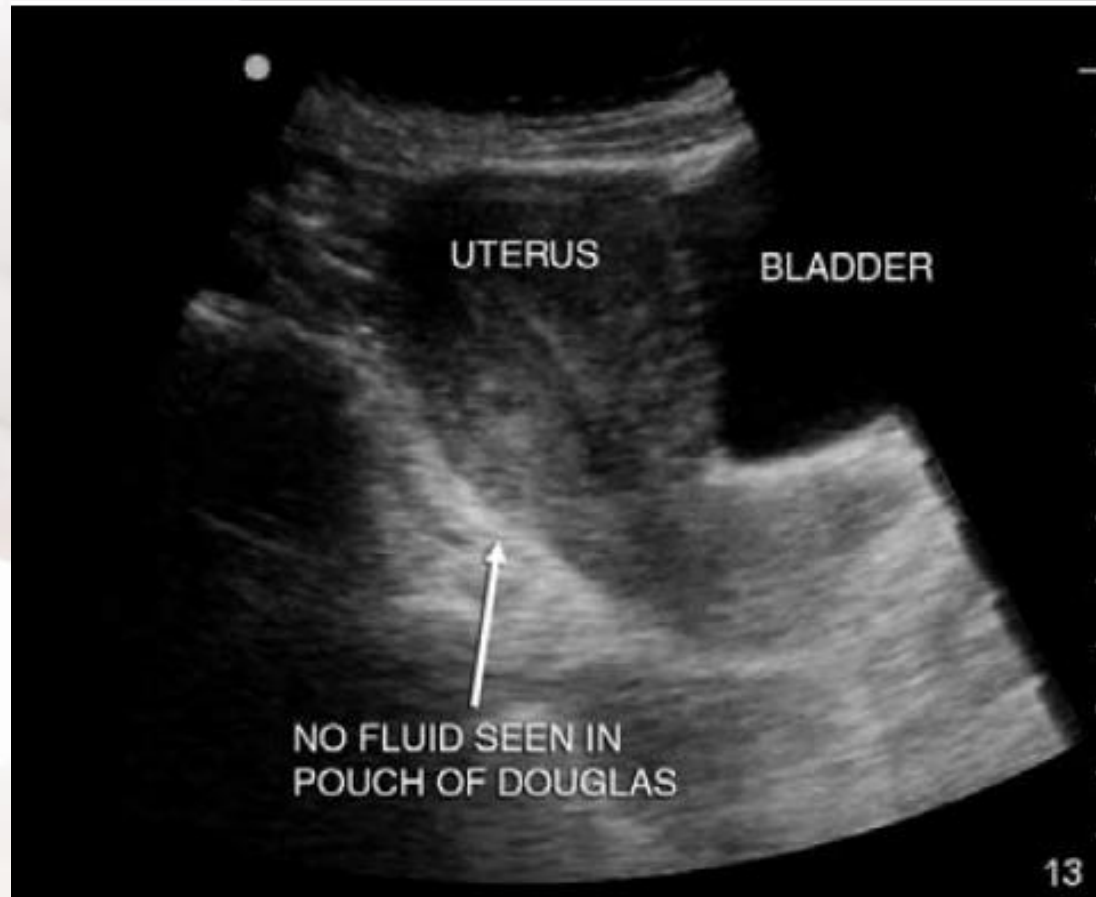
- **Rectovesical pouch** is the pocket formed by the reflection of the peritoneum from the rectum to the male bladder
- **Rectouterine pouch** (pouch of Douglas) is the pocket formed by the reflection of the peritoneum from the rectum and the back wall of the uterus



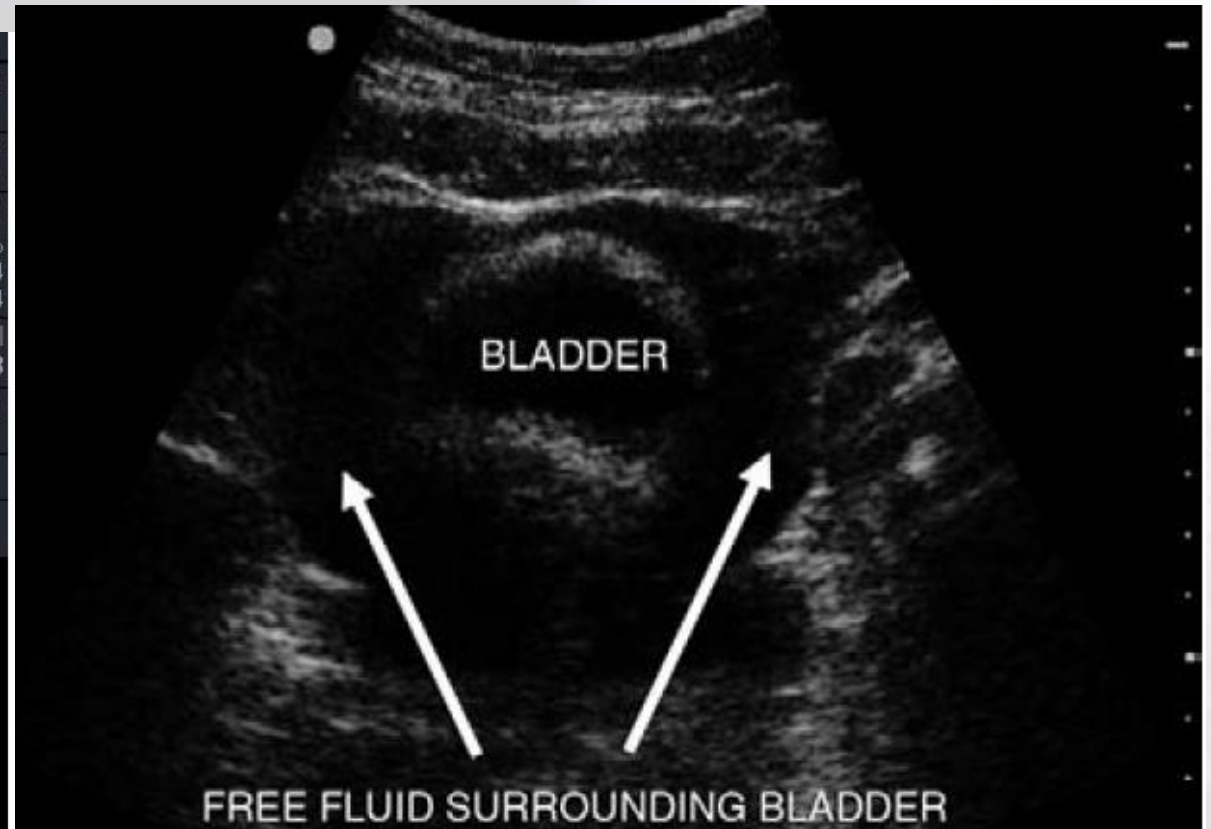
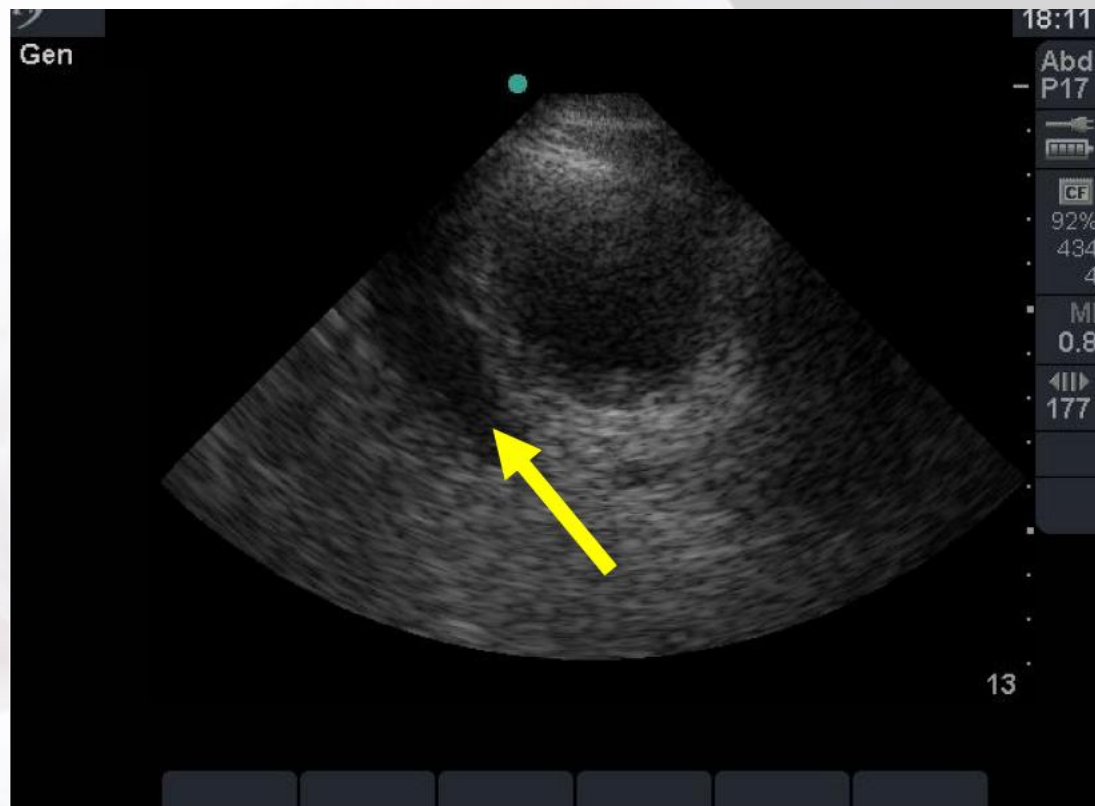
# Transverse & Longitudinal suprapubic view in female



# Transverse view

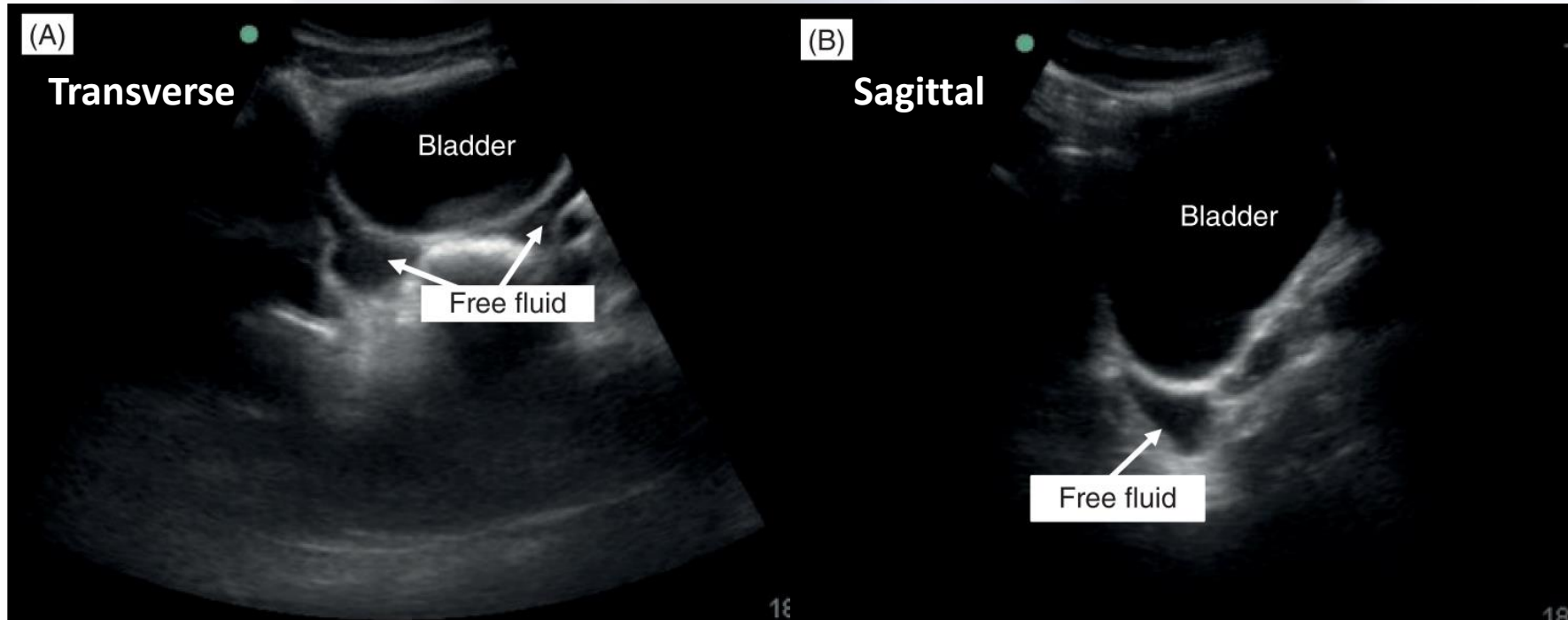


# Free fluid in pelvis





**Free fluid in pelvis**



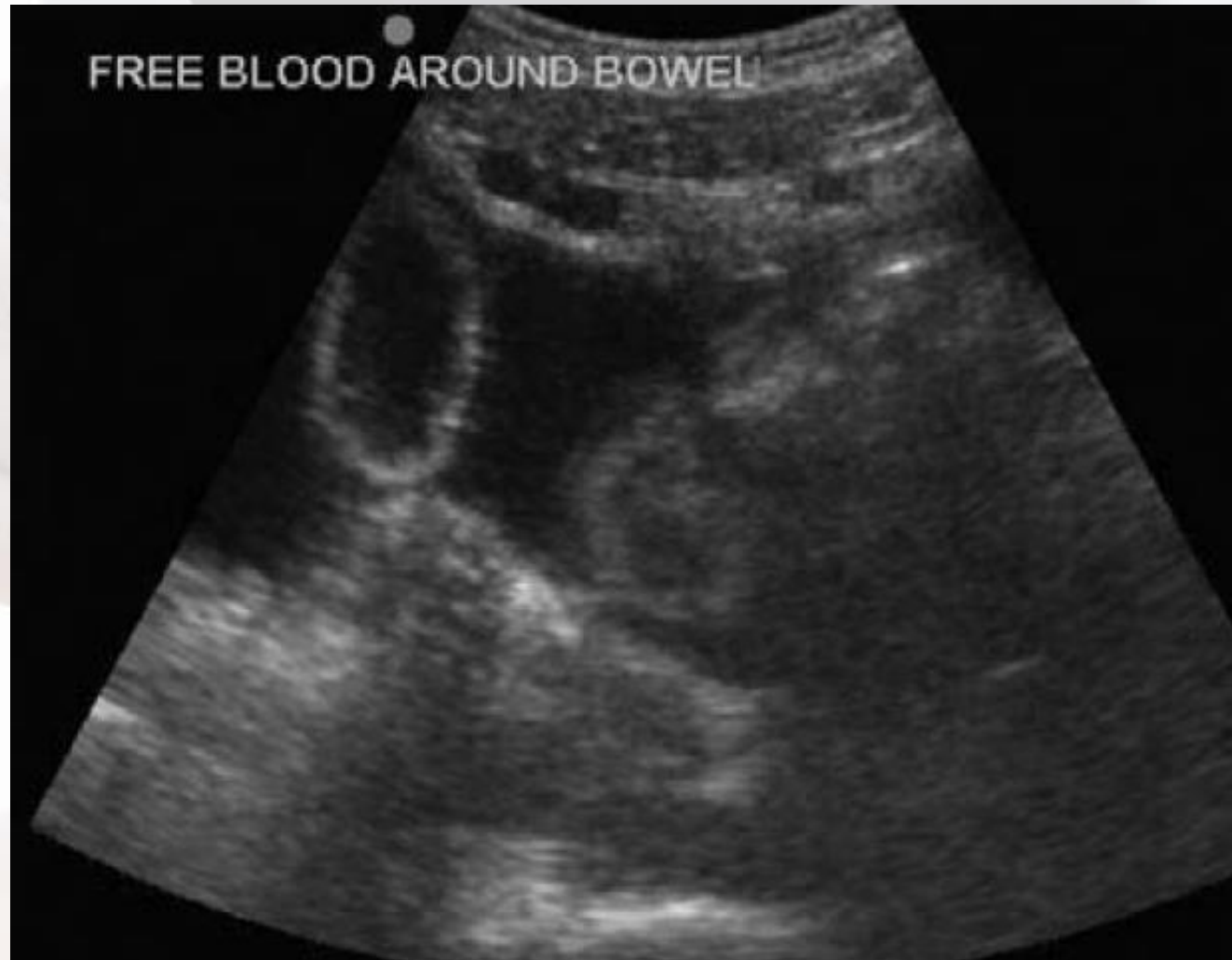
**Suprapubic FAST views with free fluid**

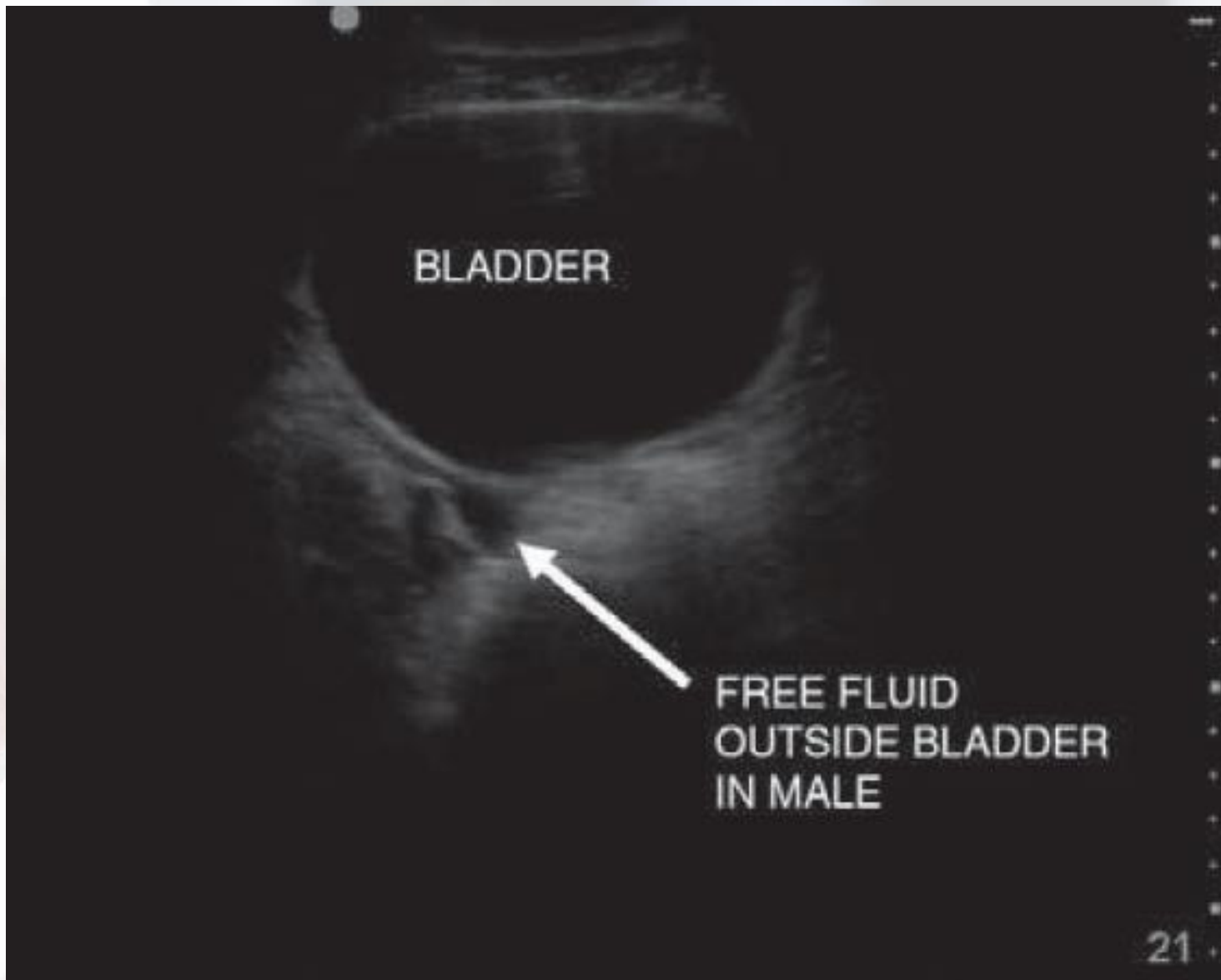
# Additional views on FAST

Paracolic gutters caudal to the upper quadrant views to detect free Fluid surrounding the bowel

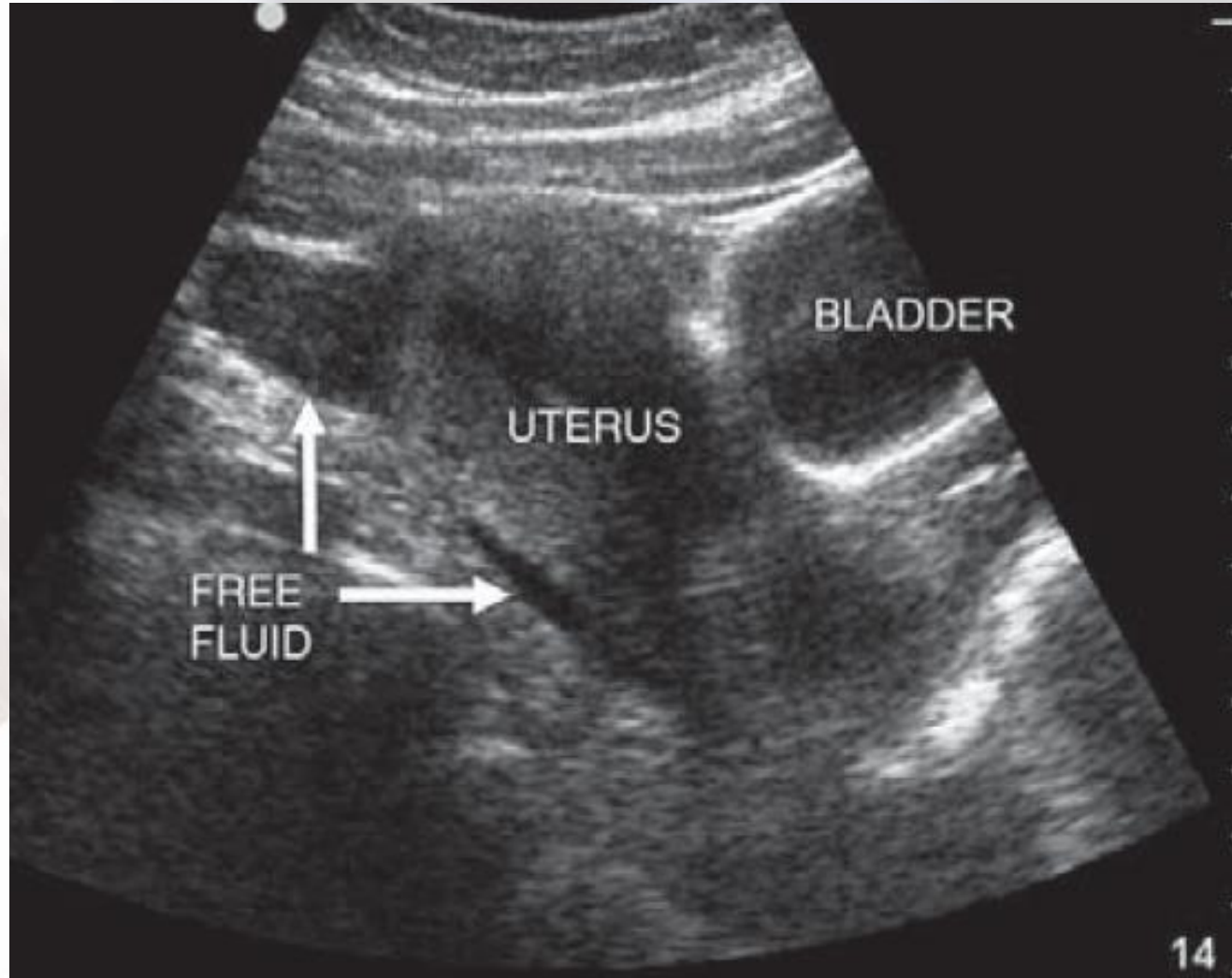


Bowel loops floating in free fluid in the pelvis









# Extended FAST to E-FAST



- **The Question:**

Is There Haemothorax (HTX)

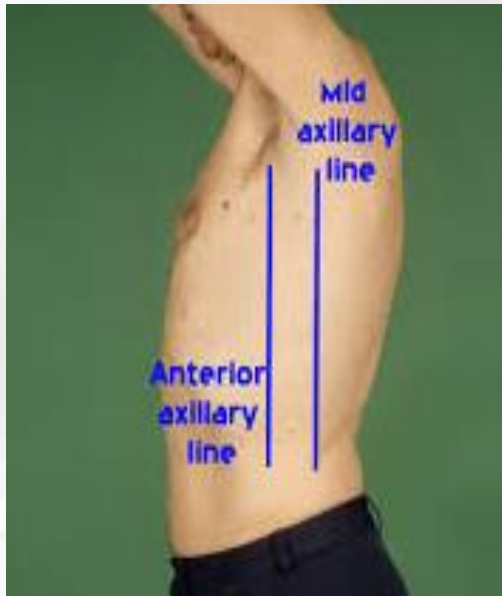
Is There Pneumothorax (PTX)?

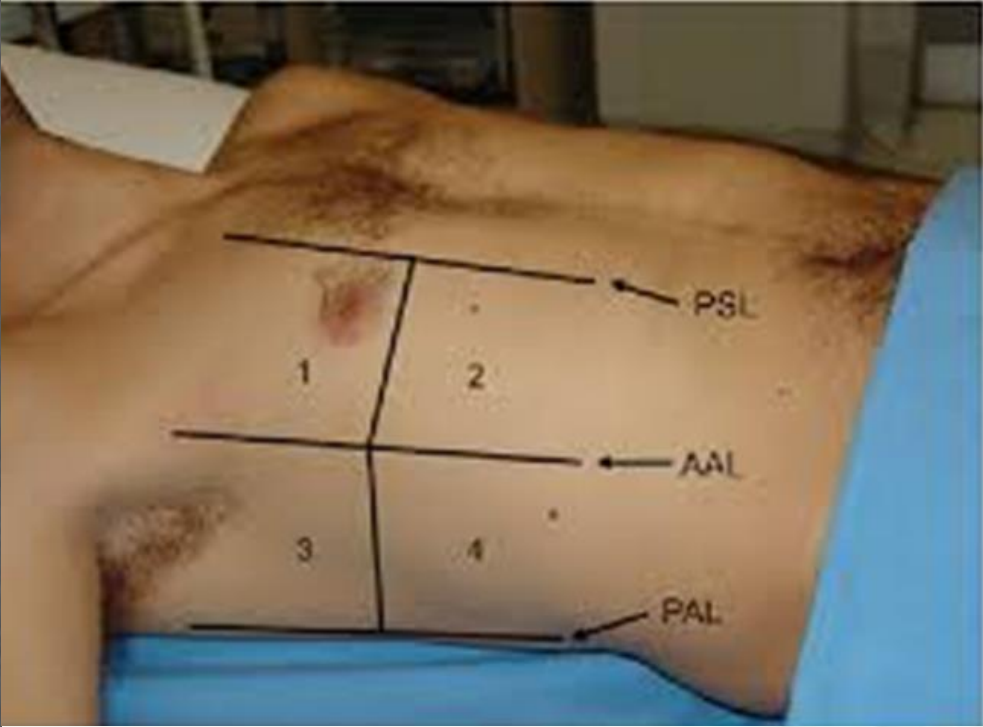
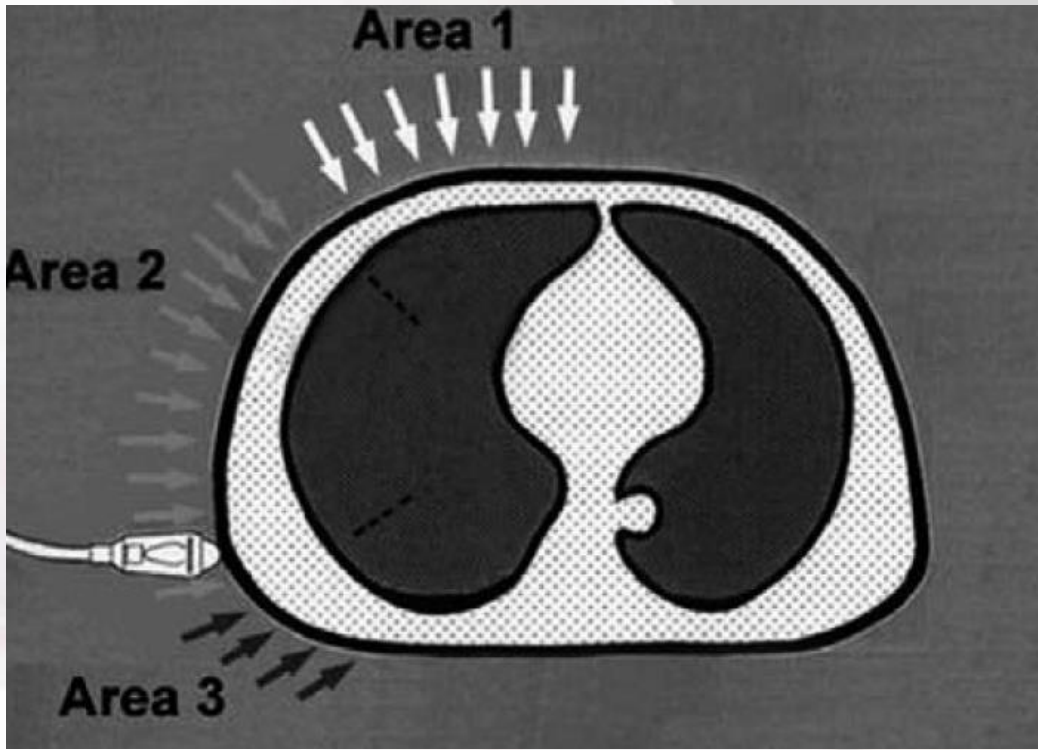


# E-FAST

- Lung

Place the transducer over **the third or fourth** intercostal space anteriorly and in the **third to fifth** intercostal space in the **anterior axillary line**.





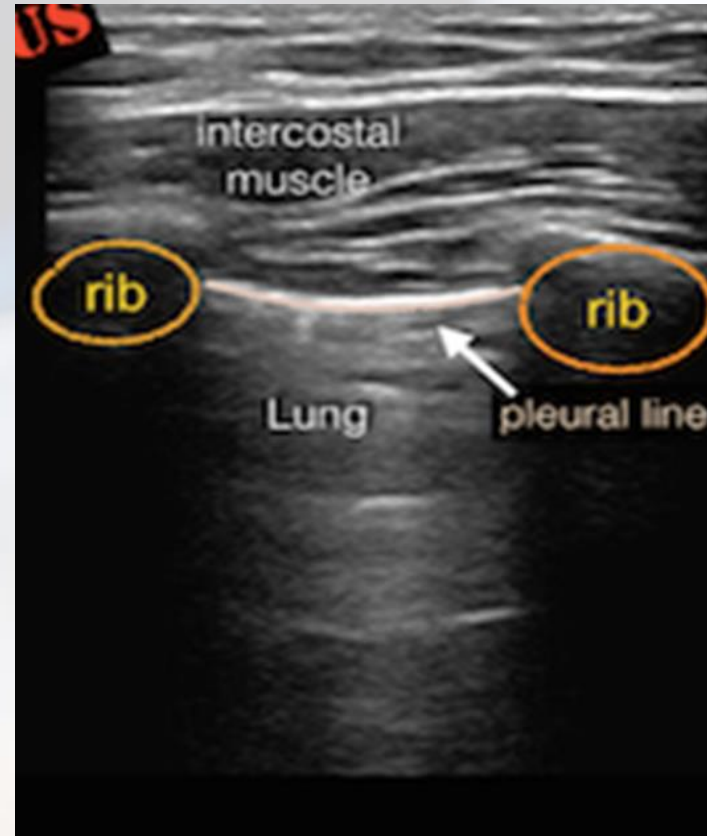
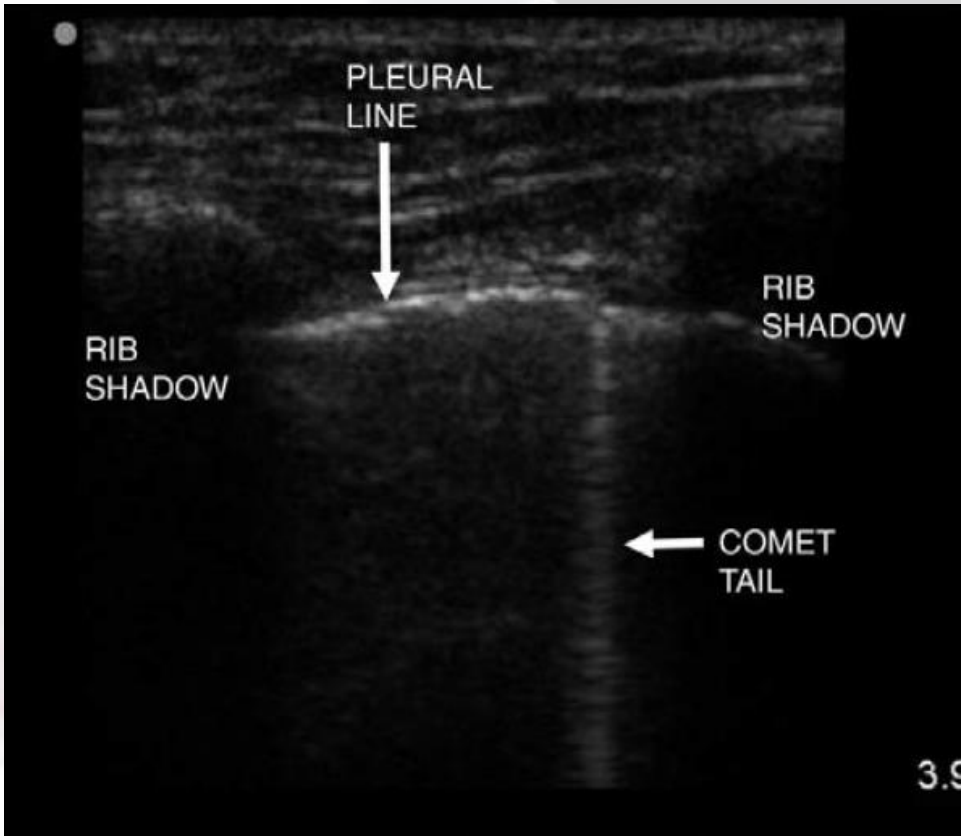
# Dynamic sliding

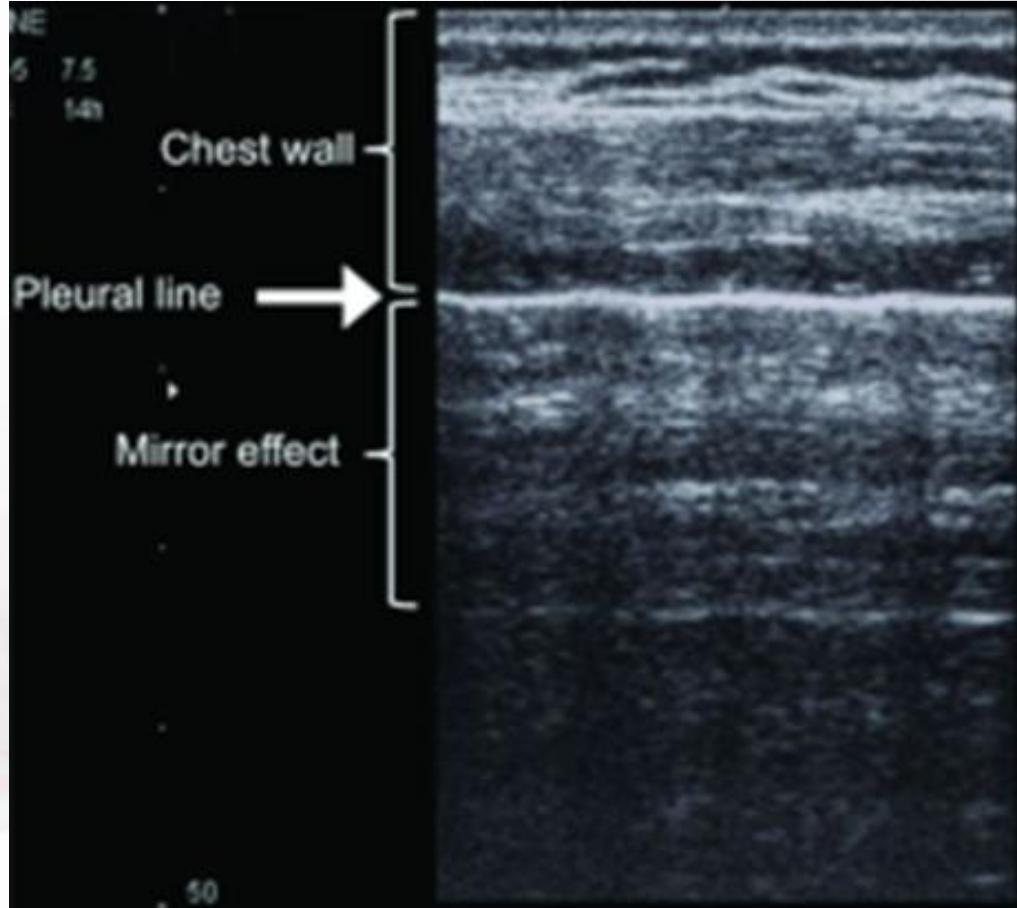
Dynamic sliding at pleural interspace:

Normal pleural line resembles a sparkling curtain sliding back & forth as the patient breathes. (The sparkle represents scatter from the air in the lung.)

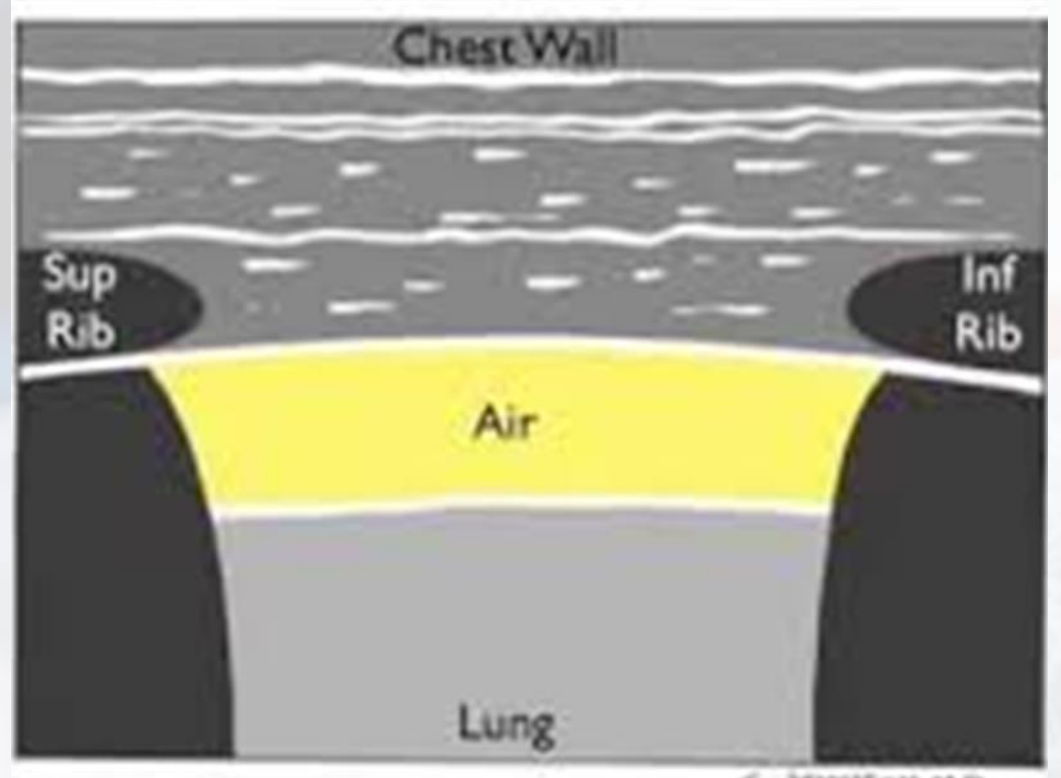
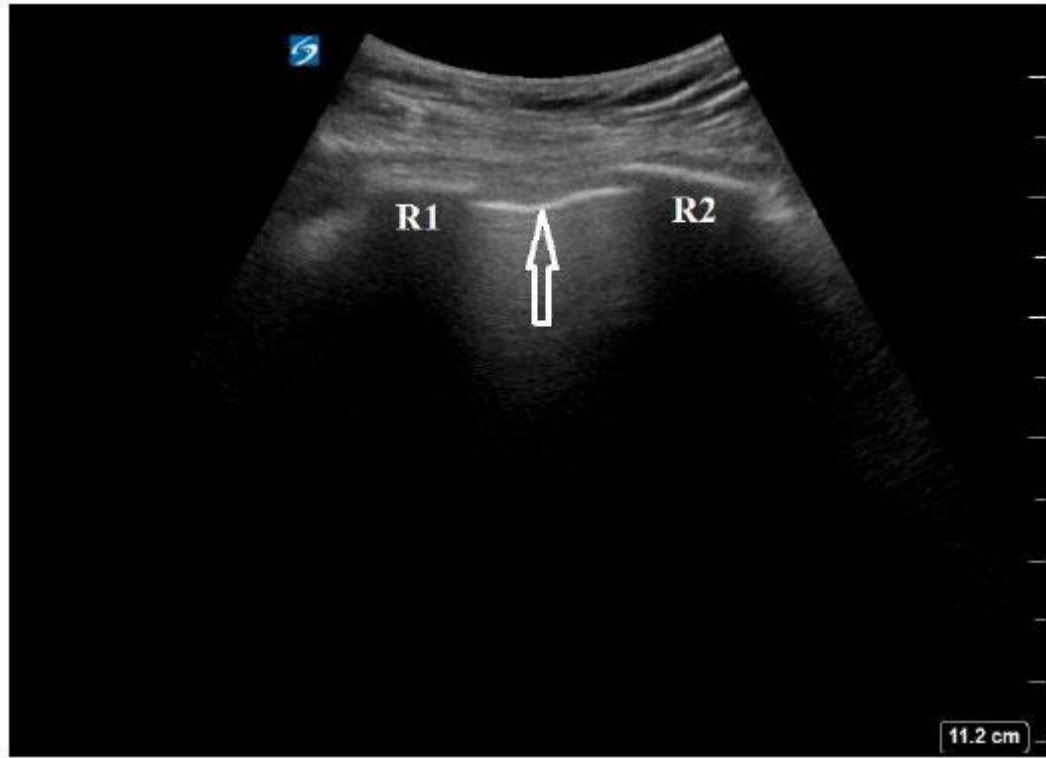
The absence of lung sliding is the most reliable ultrasound sign of pneumothorax

# Normal view of lung

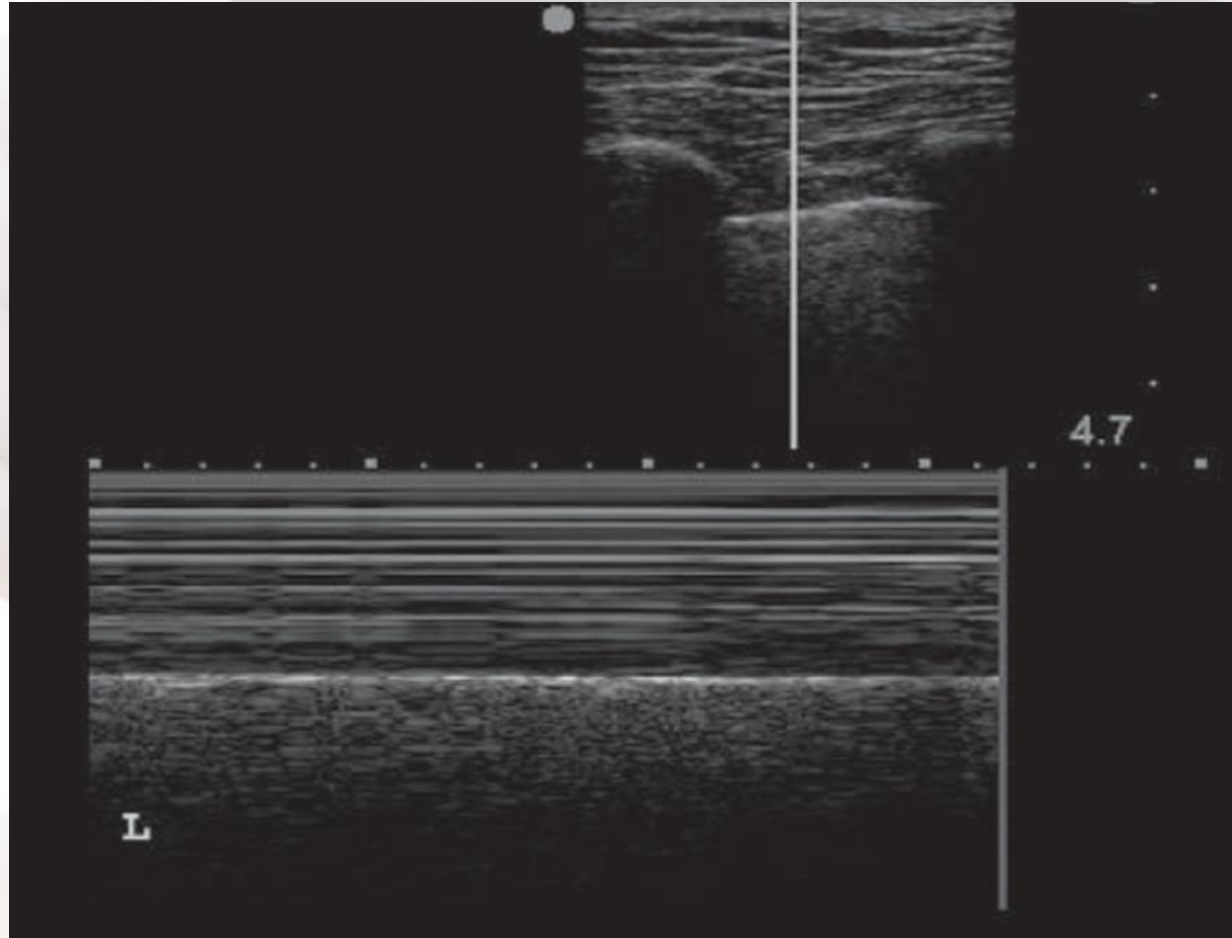




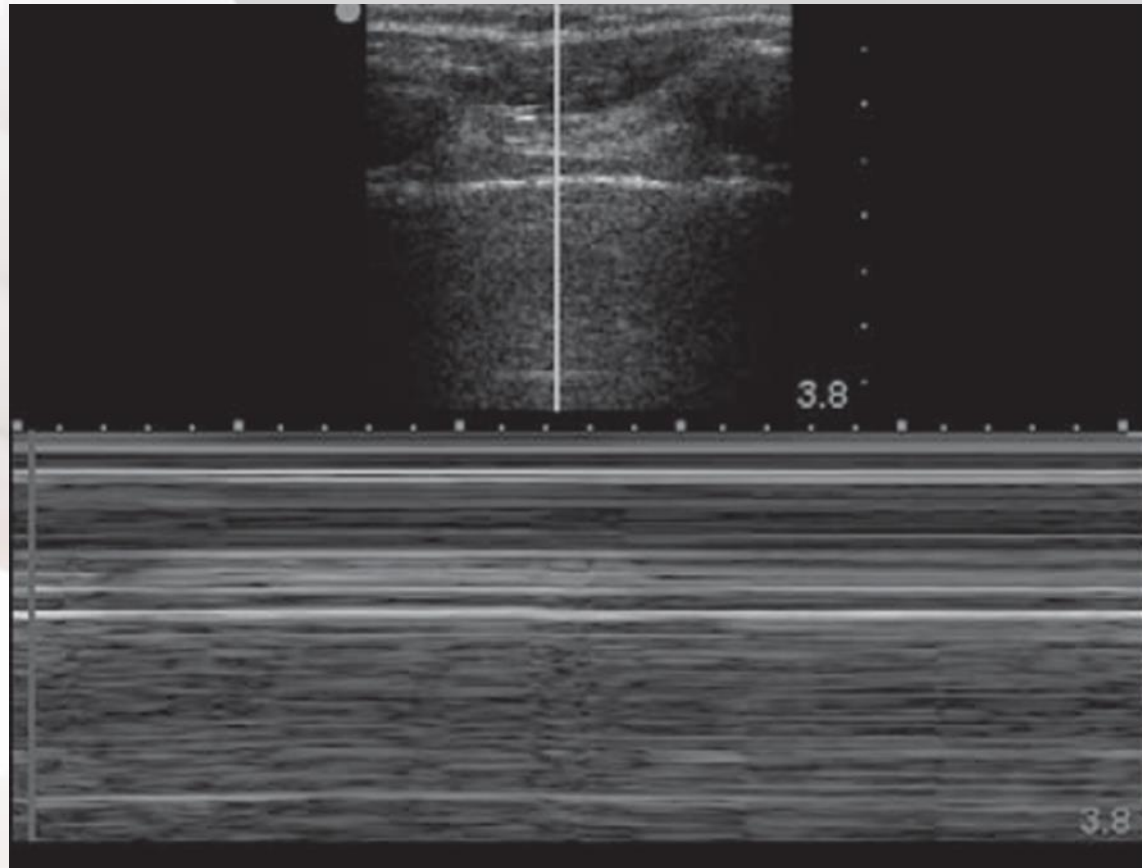




# Sea shore sign



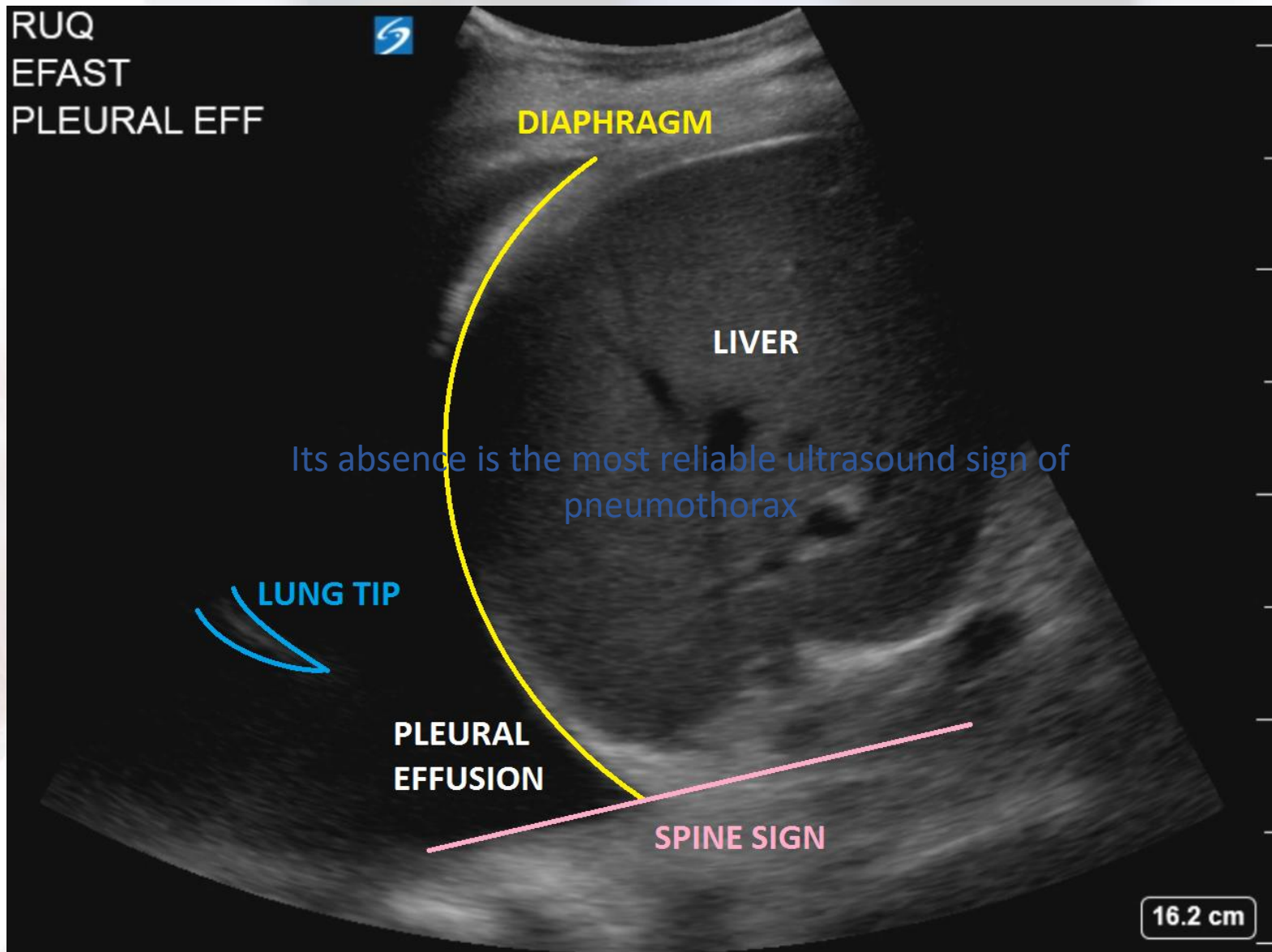
# Barcode sign



# Plural effusion









**Thank You For Your attention**