

**American College of Physicians - Internal Medicine Meeting 2025  
New Orleans, LA**

**Ultrasound-Guided Paracentesis**

**Faculty Information**

***Director:***

**Manpreet S. Malik, MD, Member**

**Stephanie Eizember, MD**

**Christopher Hillhouse, MD, Member**

**Maria Antonietta Mosetti, MD, FACP**


**Toby Terwilliger, MD, Member**

**Kathryn Flynn, Resident/Fellow Member**

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# Abdominal Paracentesis


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## Disclosure of Financial Relationships

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## Faculty

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Assistant Professor of Medicine  
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### Christopher Hillhouse, MD

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Medical Director for Cardiovascular Units  
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### Toby Terwilliger, MD

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Medical Director of Hospital Medicine  
Director, Clinical Ultrasound Course for IM  
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University of Miami

### Kathryn Flynn, DO

Chief Resident,  
Walter Reed National Military Medical Center  
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## Benefits of US in Paracentesis

- Detection of Peritoneal Free Fluid
  - Overall diagnostic accuracy of 58% of physical exam (Cattau 1982, McGibbon 2003)
  - Ultrasound detects 100-600ml (Goldberg 1970, Abrahms 1999)
- ↑ Success of paracentesis (Nazeer 2005)
  - 95% with U/S vs. 61% without U/S
- ↓ Failed attempts
  - 13 of 15 failed attempts became successful
- ↓ Unnecessary attempts
  - 14 of 56 (25%) too little fluid



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## Benefits of US in Paracentesis

- ↓ Bleeding complications
  - Most common complication of paracentesis (Sharzei, 2014)
  - 0.27% with U/S vs. 1.25% without U/S (Mercaldi 2013)
    - ↑ Hospital mortality with bleeding (12.9% vs. 2.9%)
    - ↑ Costs (\$19K) and LOS (4.3 days,  $p < 0.0001$ ) with bleeding
  - 10% of Selected Sites have Vessels (Barsuk 2017)
  - 0.5% minor bleeding risk with US, despite INR/plts (Lin 2005)



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“I could throw a dart into that from across the room”



4.9



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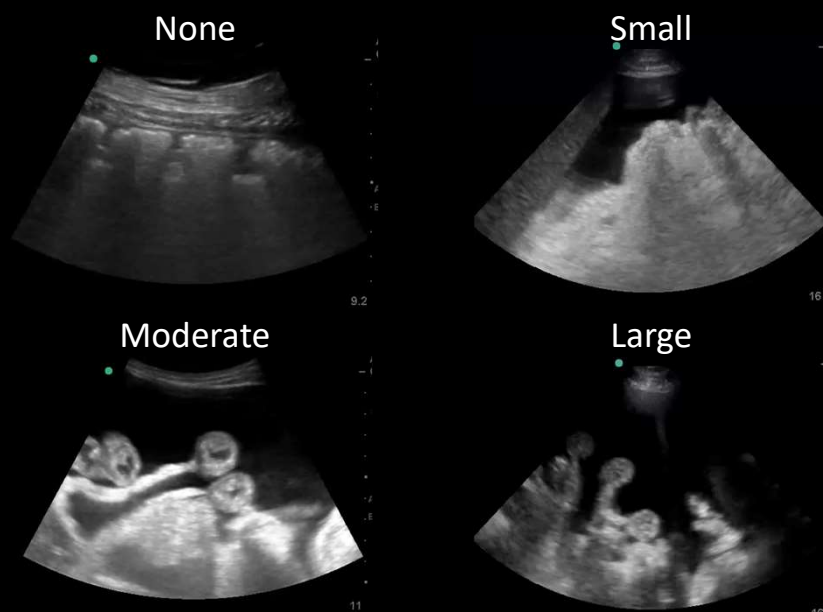
## Pre-procedure Ultrasound Evaluation *Paracentesis*

- ① Peritoneal Free Fluid
  - Volume
  - Character
- ② Paracentesis Site Selection
  - Largest, shallowest collection
  - Depth
  - Vessels



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## Volume of Ascites



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## Characterization of Peritoneal Fluid

Loculated Ascites

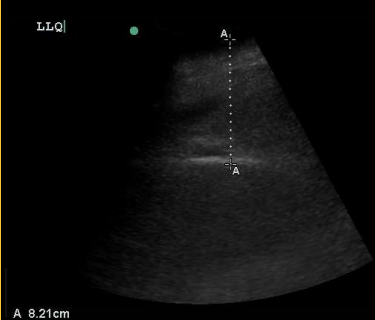


Hemoperitoneum



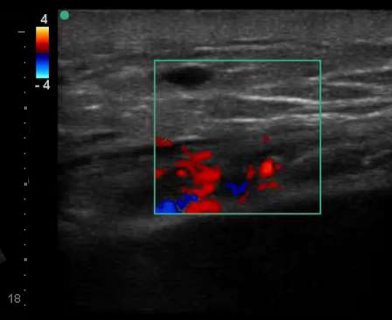
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## Paracentesis Site Selection



Measure  
Depth

Image: Nilam Soni



Avoid  
Blood Vessels

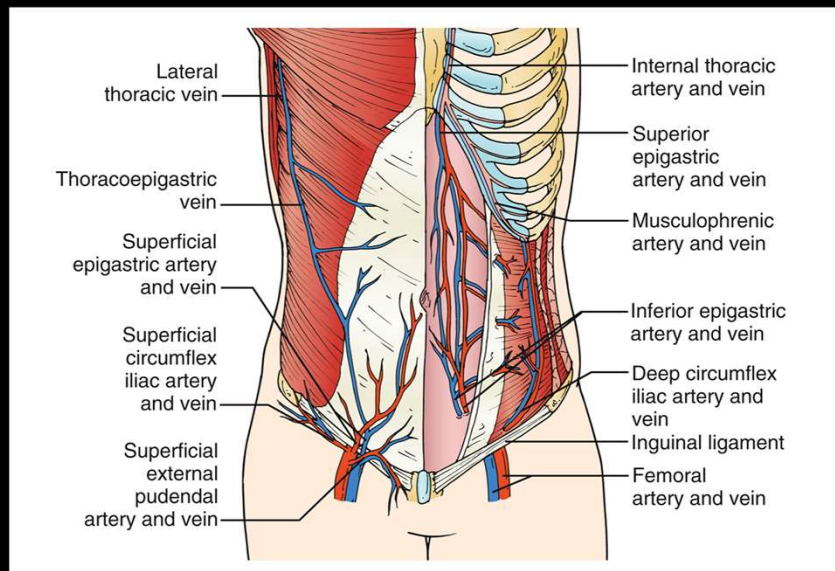


Avoid  
Adjacent Structures



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## Abdominal Wall Vessels



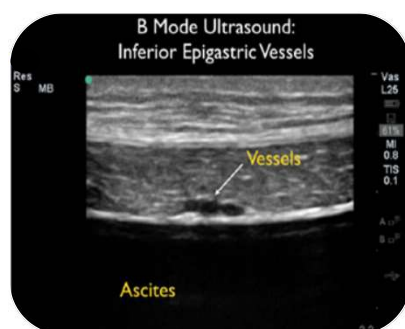
From Point-of-care Ultrasound, 2014



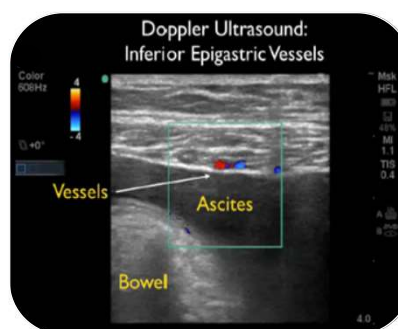
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## Vascular Evaluation

The Society of Hospital Medicine's Positional Statement recommends evaluating abdominal wall vasculature with the vascular probe (5-11Hz) with power and or color doppler to screen for vessels. A low-frequency transducer capable of color flow Doppler ultrasound may be utilized in patients with a thick abdominal wall.



Inferior Epigastric Vessels



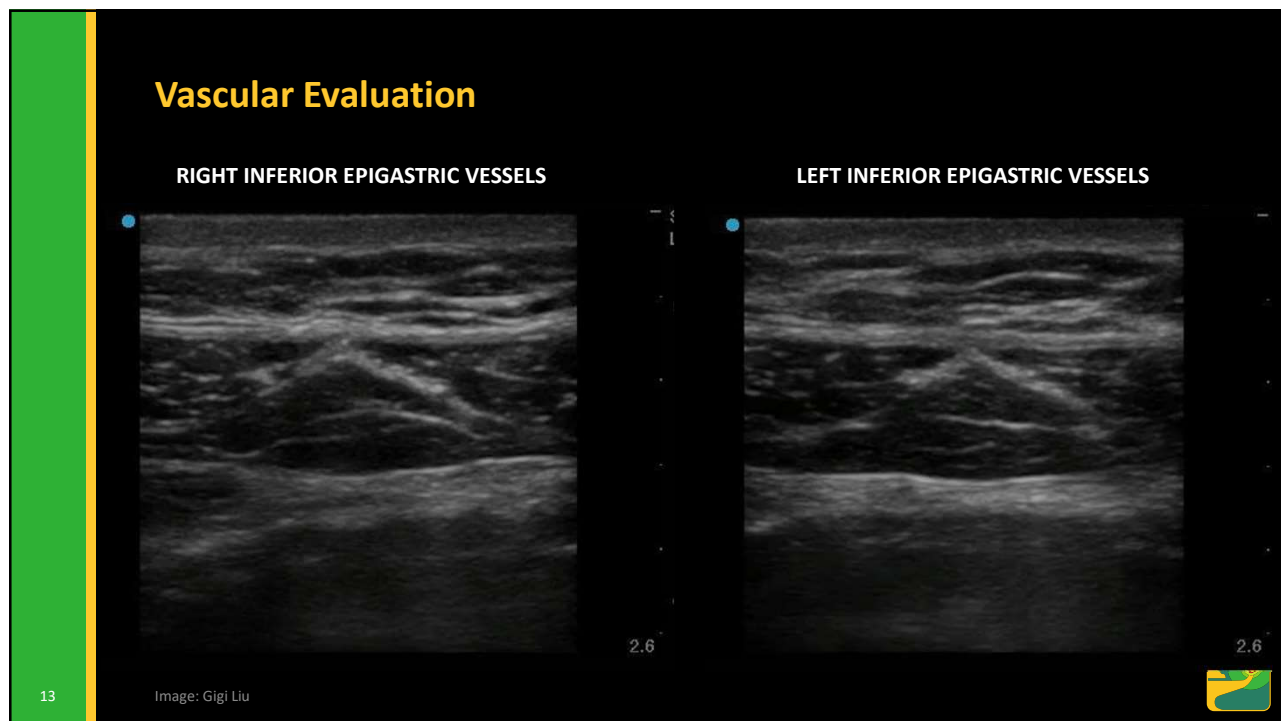
Doppler of the IE vessels

Cho J, Jensen TP, Reiersen K, et al. Recommendations on the Use of Ultrasound Guidance for Adult Abdominal Paracentesis: A Position Statement of the Society of Hospital Medicine. *J Hosp Med.* 2019;14:E7-E15. Published 2019 Jan 2. doi:10.12788/jhm.3095

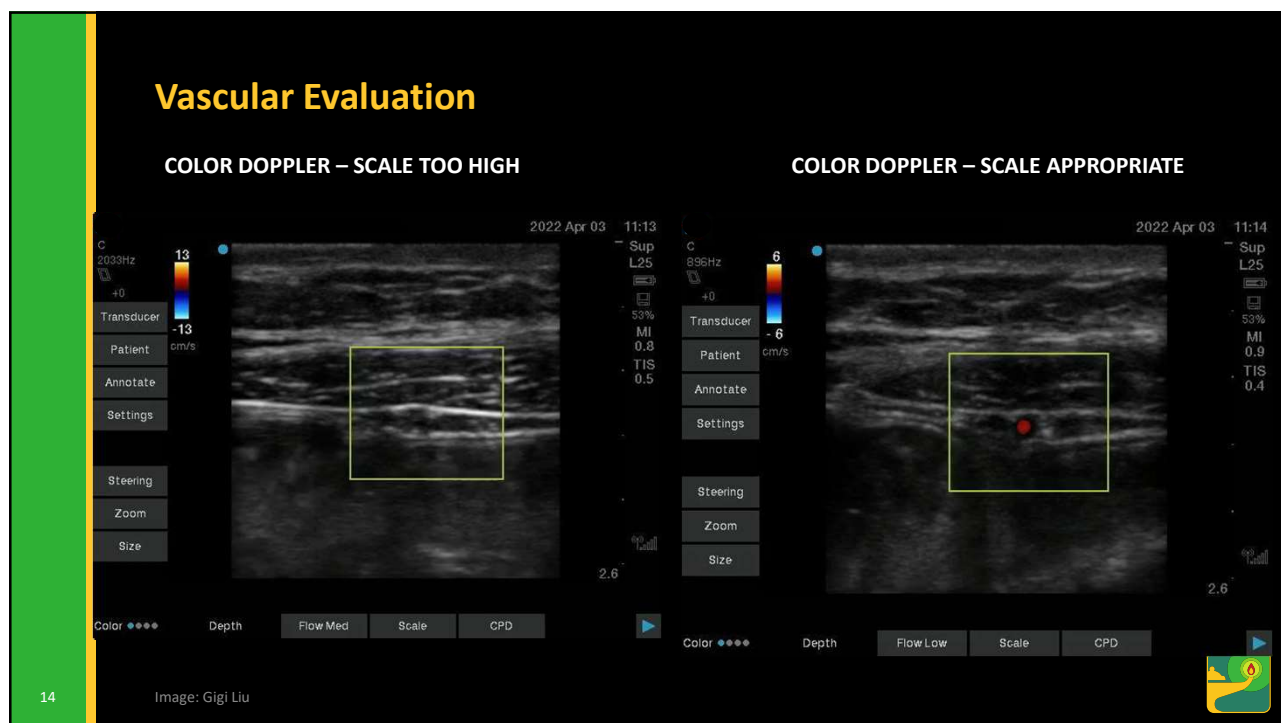


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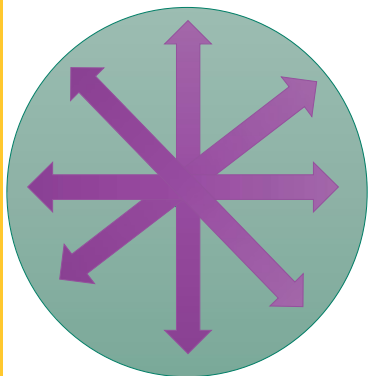
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## Vascular Evaluation



Paracentesis Technique – POCUS Pro and Proceduralist.org

How to prevent bleeding  
Slide slowly in 4 planes



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## Abdominal Wall

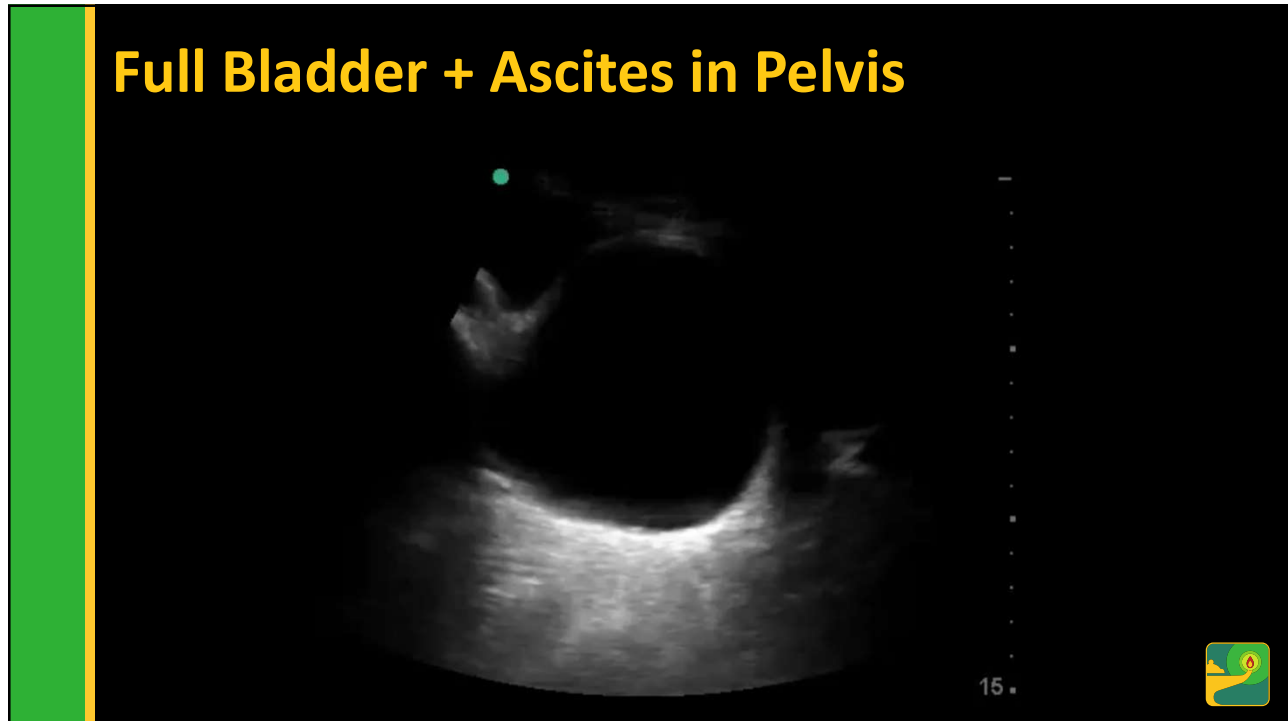


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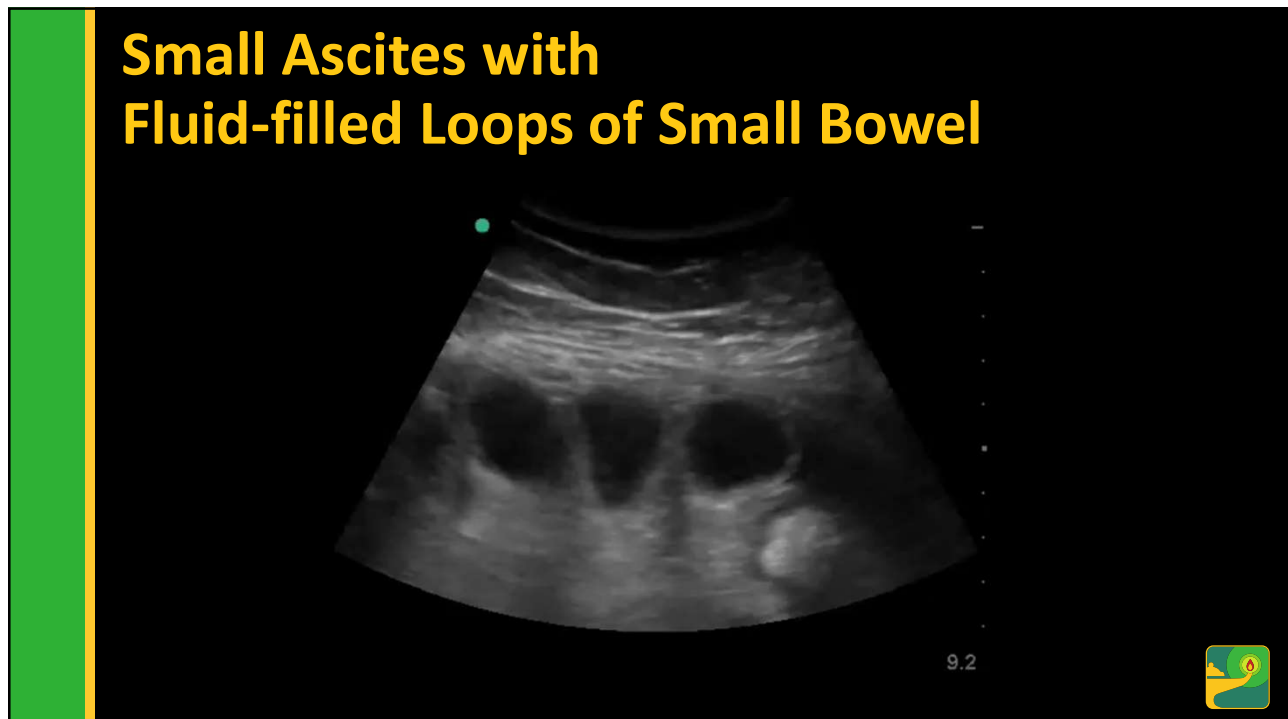
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## Full Bladder + Ascites in Pelvis



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## Small Ascites with Fluid-filled Loops of Small Bowel



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## Sufficient volume to tap?



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## Diagnostic Paracentesis: *Real-time needle visualization*



4.0



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## Technique: Areas of Focus



- Keep patient in same position as you scanned in.
- Anesthetize all layers carefully.
- Aspirate as you go in to pick up blood vessels missed by ultrasound.
- Insert Catheter at the same angle as scanning angle
- Insert 0.5cm to 1cm beyond the point where fluid is aspirated to prevent catheter coiling in subcutaneous layers or peritoneum.
- Look for color of fluid.
- Use albumin early!



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## Let's practice!

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Cases



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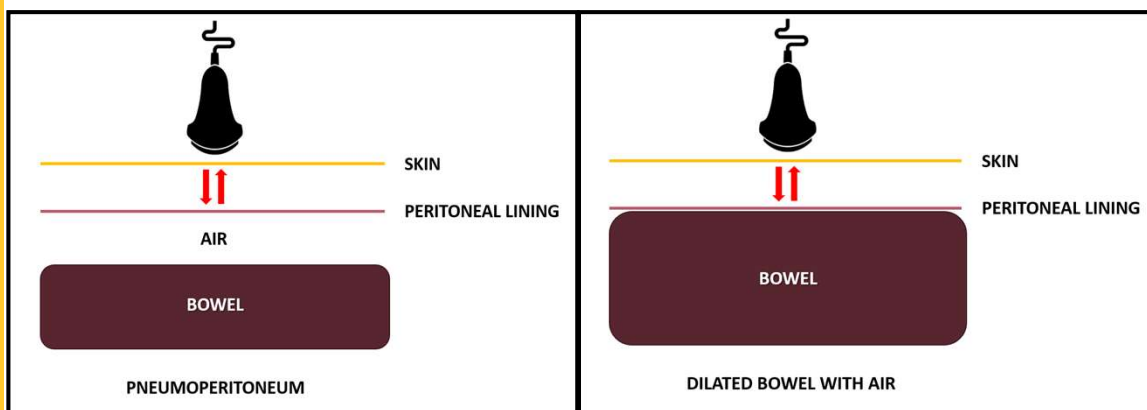
Cases



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## Where is the air?

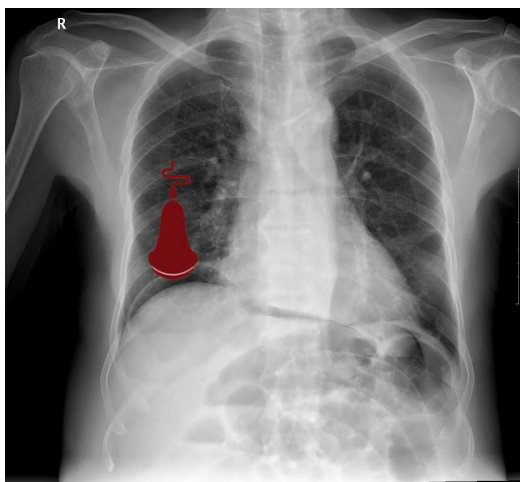


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## A-Lines under the diaphragm



Case courtesy of Dr Varun Babu, Radiopaedia.org, rID: 19474

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## Abdominal Pain after paracentesis



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## Imaging with power doppler over site marked for paracentesis



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Image: Ria Dancel, UNC

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## Stay Safe from “Landmines” for Paracentesis



### Bowel

- Complex Ascites
- Abdominal A Lines
- Dilated Bowel
- Pneumoperitoneum
- Ileus/SBO



### Perforation Bleeding

- Peritoneal Point
- Bubbles in Ascites
- Bowel Content
- Hematocrit Sign
- Bleeding Jet



### Abdominal Wall Vessels

- 360 Evaluation
- Low Doppler Scale
- Limitations with Ultrasound

