



# GHAPP

Gastroenterology & Hepatology  
Advanced Practice Providers

## 2021 Fourth Annual National Conference

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**GHAPP**

Gastroenterology & Hepatology  
Advanced Practice Providers

# Central Line and Paracentesis

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# Disclosures

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# Disclosures

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**Jeremy Flowers, DNP**

Speakers Bureau: AbbVie, Clinical Area – IBD

- At the end of this course participants will be able to
- Describe clinical indications for central venous access
- Review different types of central venous access
- Identify sonographic considerations related to vascular assessment
- Review steps for placement of a non-tunneled central line
- Review indications for paracentesis
- Review steps for paracentesis
- Discuss role of paracentesis for determination of SBP
- Understand criteria for SBP ppx

# Central Lines

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- Are used to have access to central venous circulation (superior vena cava or inferior vena cava most frequently)
- Administration to the largest veins in the body allows for prompt hemodilution and limits potential damage to blood vessels due to osmolality, pH or other physical characteristics
- Central lines can be used to administer medications, nutrition, chemotherapy or provide for physiological monitoring
- 3 common anatomic insertion sites: internal jugular, subclavian, and femoral veins

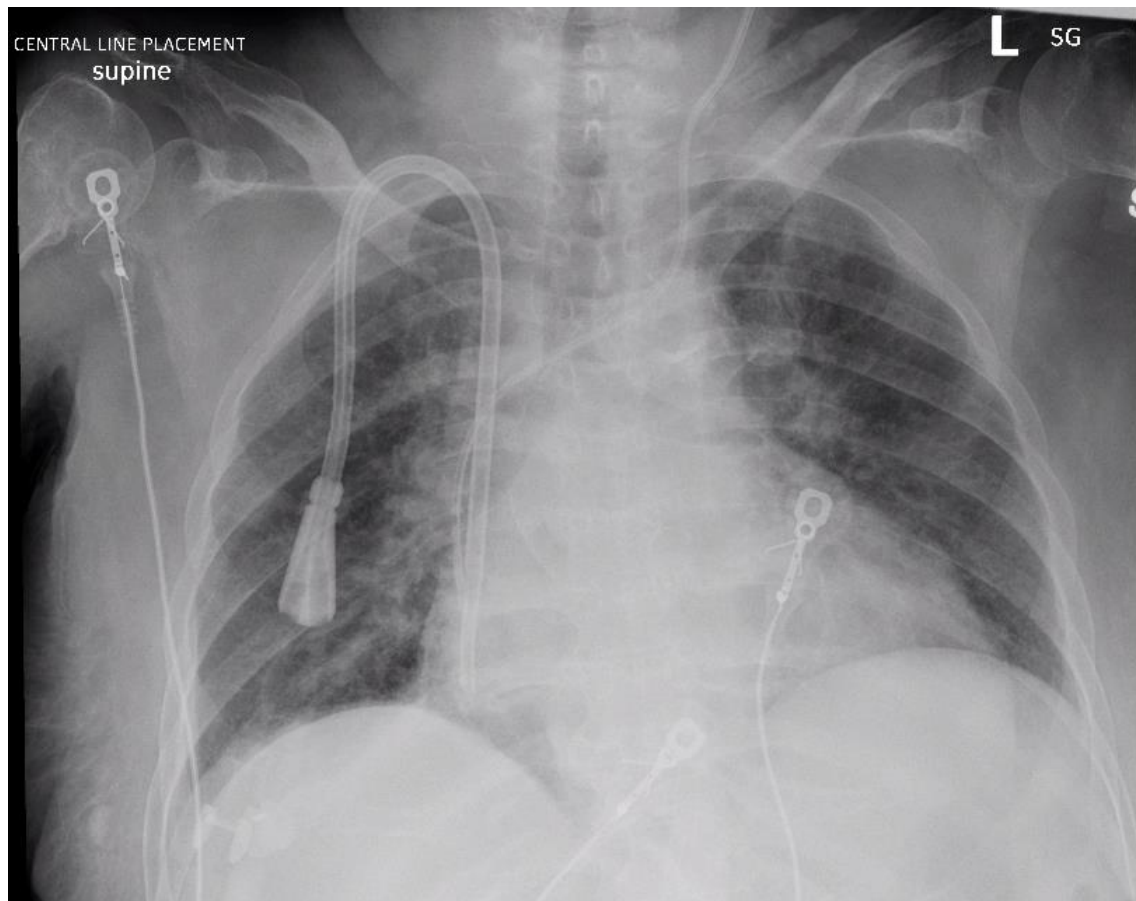
# Types of Central Lines

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- Non tunneled
  - Primarily designed for short term use
  - PICC lines can be intended for long term use
- Tunneled
  - Tunneled catheter is a central line that is placed under the skin in a vein, allowing long-term access to the vein
  - Frequently has a cuff that will have epithelization into to help prevent infections
- Subcutaneous venous ports
  - Has a reservoir under the skin that is access with special needles for intermittent access. Needs to be positioned over bony support
  - Designed for long term use and central access
  - Often placed to anterior chest, but alterative sites can include arm, pelvis

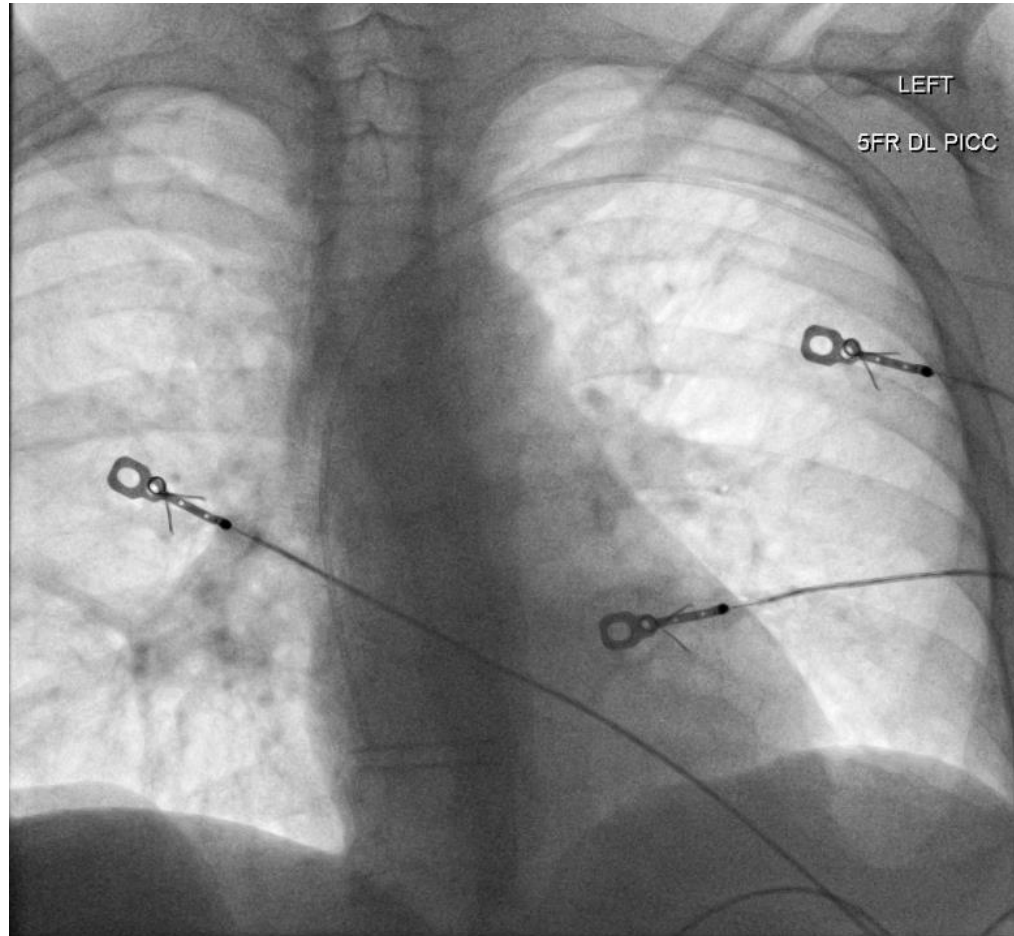
# Non Tunneled Lines

- Here is a left internal jugular line



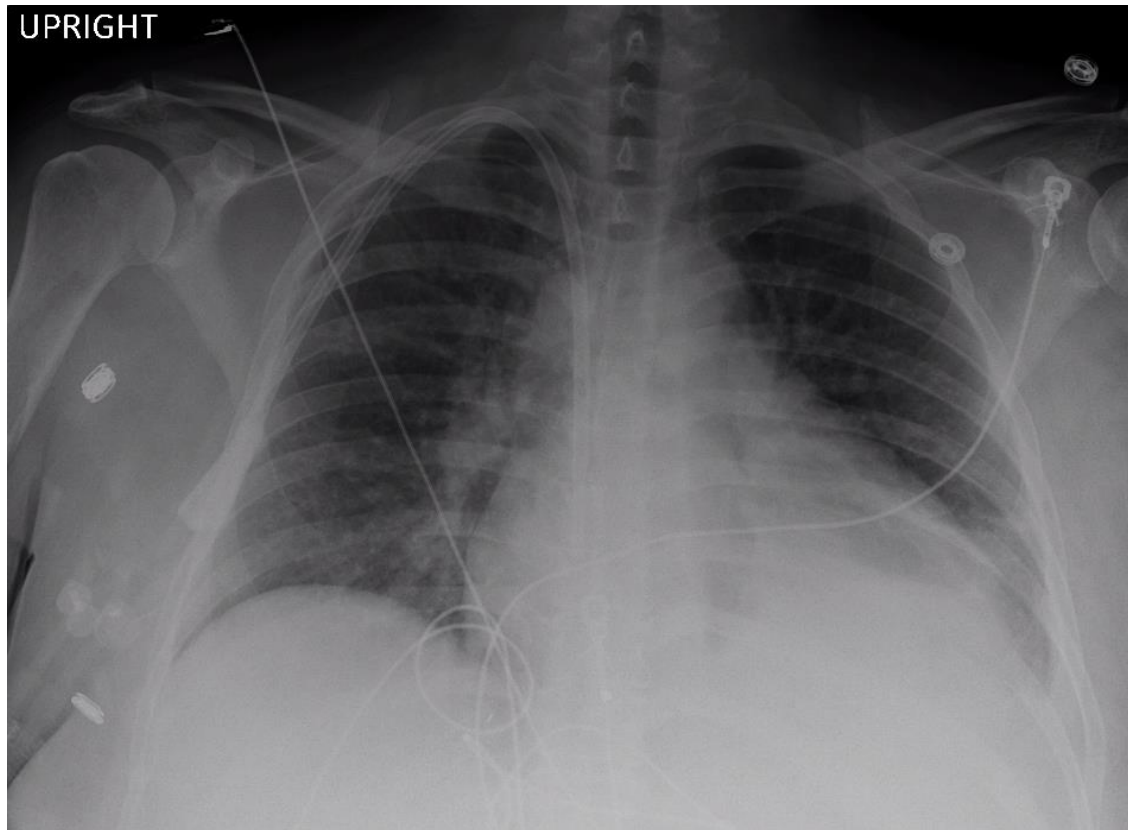


# PICC Line



# Tunneled Lines

- Tunneled dialysis catheters are frequently used



# Subcutaneous Venous Ports

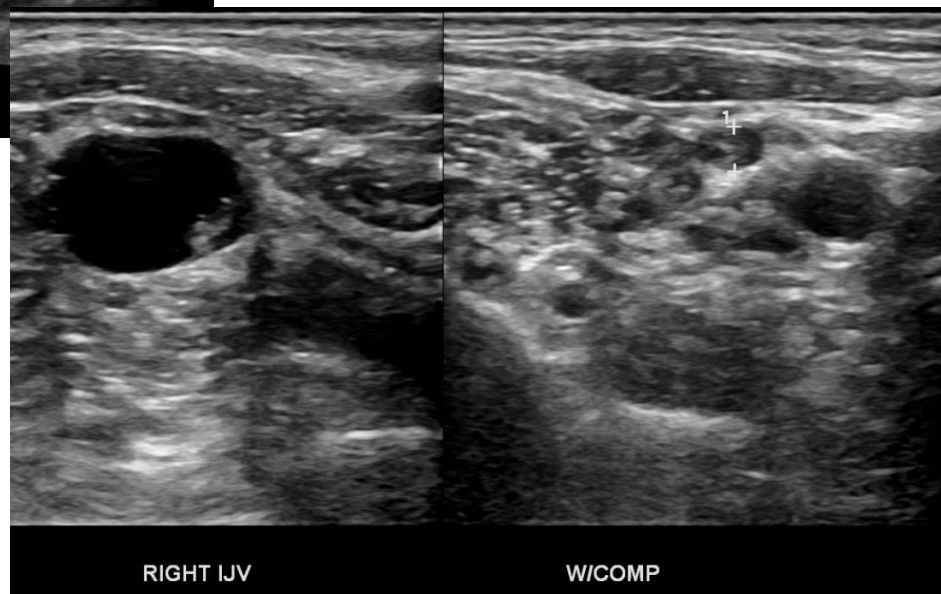
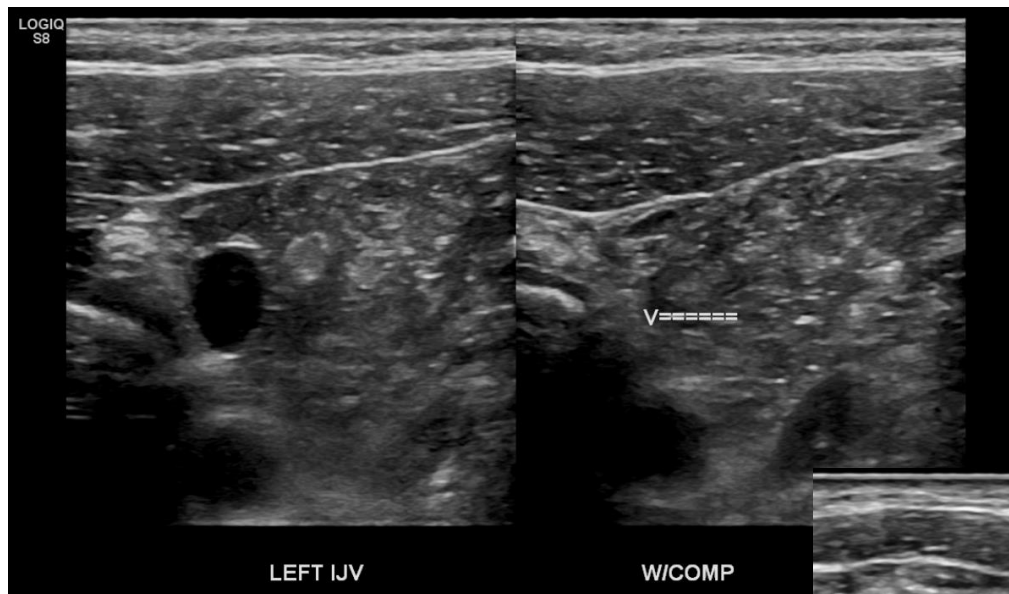
- Chest port

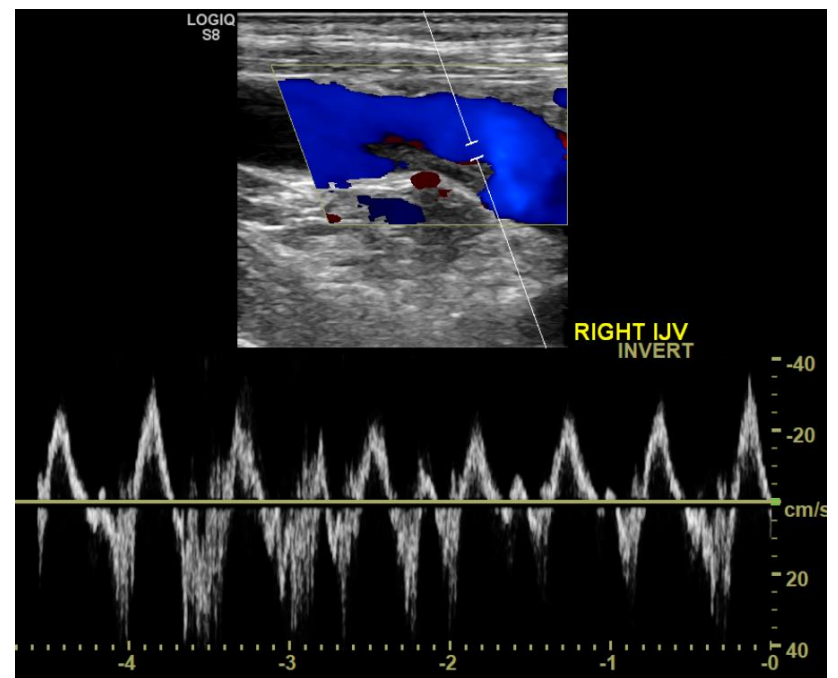
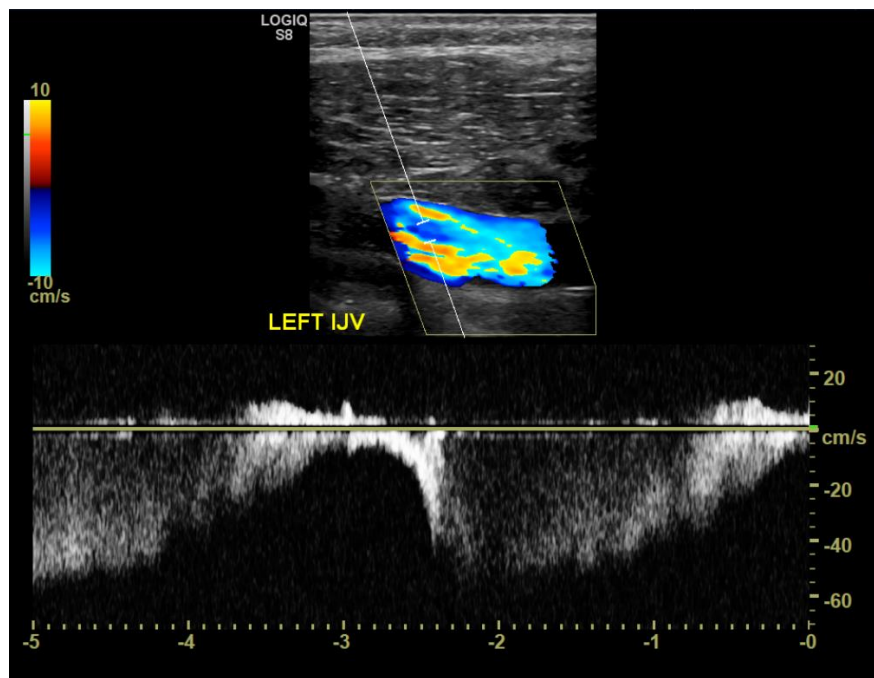


# Ultrasound Evaluation of Veins for Vascular Access

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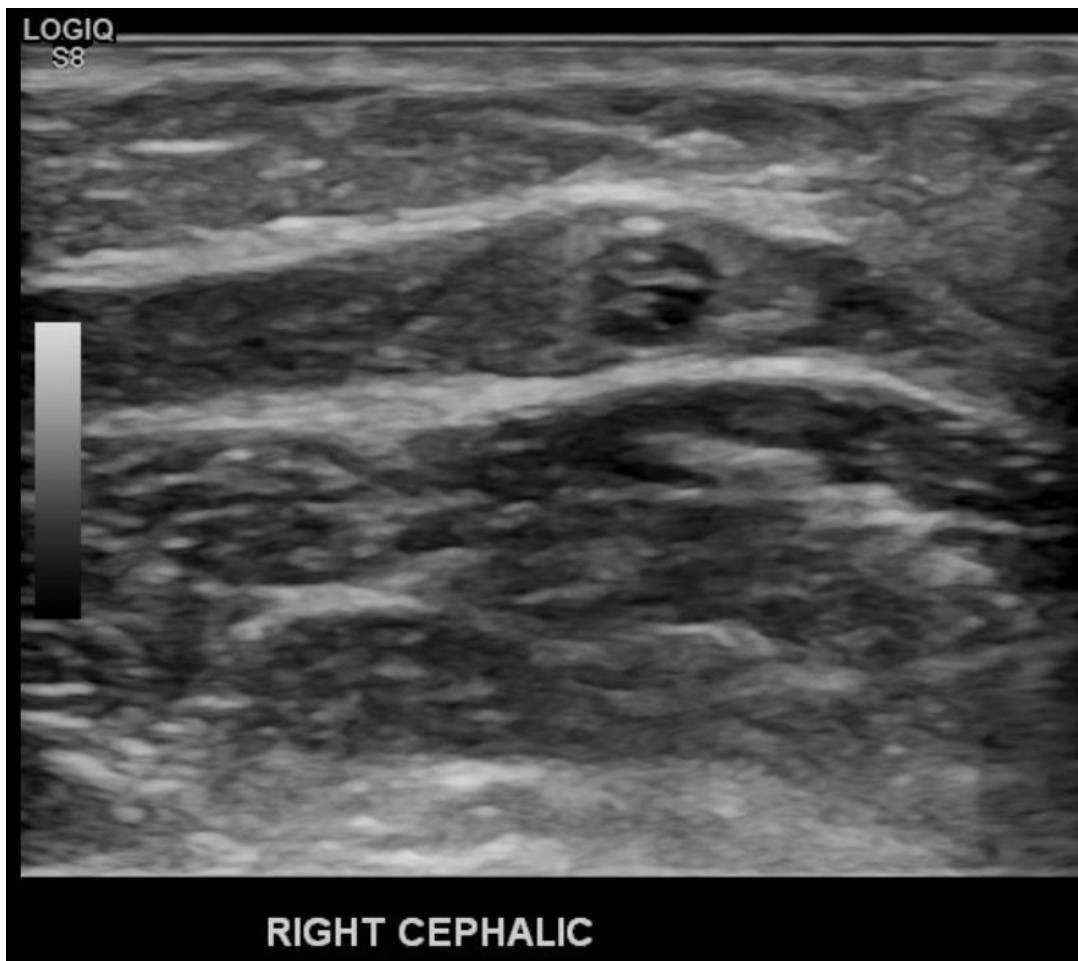
- Veins should be evaluated for access sites
- Veins should be adequate size to accommodate desired catheter (catheter to vein ratio 45% or less)
- Vein should demonstrate patency
  - Compressibility
  - Color Doppler imaging
  - Lack of echogenic focus (long and short view)
- Appropriate access any structures blocking the needle/catheter













# Central Line Placement

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- Consent
- Risks, benefits, alternatives need to be discussed
- Common risks:
  - Placement failure, bleeding, infection, damage to tissues/structures, Thrombosis. Vessel stenosis, and failure of vessels for future use
- Alternatives

- Ultrasound guidance has become the standard of care
- Seldinger technique or a modified Seldinger technique frequently used
- Seldinger technique – a needle is used to enter the vein, a guide wire is advanced through the needle, needle removed and a central catheter is advanced. Some lines use a peel away sheath
- Modified Seldinger technique – catheter over the needle (such as an standard IV) is used to enter the vein, a guide wire is advanced through the catheter, catheter removed and a central catheter is advanced. Some lines use a peel away sheath

- Verification of line placement
- Clinical verification – does the line aspirate and flush easily, bright red or dark red blood
- Radiographic imaging for subclavian or internal jugular lines
- EKG or can be done for some PICC lines
- Femoral lines do not require abdominal x-ray

# Central Venous Line Associated Bloodstream Infections

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- Reportable event to CMS
- A CLABSI is a primary bloodstream infection (that is, there is no apparent infection at another site) that develops in a patient with a central line in place within the 48-hour period before onset of the bloodstream infection that is not related to infection at another site. Culturing the catheter tip or peripheral blood is not a criterion for CLABSI

# Paracentesis

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- Removal of peritoneal fluid from the abdominal pelvic cavity
- Diagnostic or therapeutic
- Therapeutic – for patient comfort decreased abdominal distension and bulk related symptoms due to tense ascites
- Diagnostic
- Can be used to characterize ascites and screen for infection
- Three main causes of ascites are cirrhosis, cardiac, malignancy

# Contraindications/Considerations

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- Small fluid pockets
- Coagulopathy (such as platelet count  $<50,000$ , or elevated INR)
- Distended urinary bladder or bowel
- Cellulitis or skin infection at proposed insertion site
- Pregnancy
- Acute abdomen that requires surgery

# Diagnostic Paracentesis

- Serum-ascitic albumin gradient (SAAG).
  - Calculated by subtracting the albumin concentration of the ascitic fluid from the albumin concentration of a serum specimen obtained on the same day
  - SAAG level of 1.1 g/dL or greater indicates that ascites is due to portal hypertension
- Total protein
  - Protein level of 2.5 g/dL or greater suggests accumulation may be due to heart failure
- Fluid culture- historical low yield
- Cytology requires large volume
- Spontaneous bacterial peritonitis – A count of 250+ neutrophils

# Ascites Biochemical Analysis

Type	SAAG >1.1 g/dL	Ascites Protein >2.5 g/dL
Cirrhosis	High	Low
Cardiac	High	High
Malignancy	Low	High



# Additional Tests


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- Adenosine deaminase – increased in tuberculous ascites and peritoneal carcinomatosis
- Amylase – increased levels associated with acute pancreatitis and pancreatic pseudocyst
- Glucose – can be decreased with infection and malignancy
- Lactate dehydrogenase often low in cirrhotic and elevated in malignancy

# Spontaneous Bacterial Peritonitis

- Defined by the presence of neutrophil cells greater than or equal to  $250/\mu\text{L}$  or a positive bacterial culture in the ascitic fluid without evidence of an abdominal source
- RBC correction
- For every 250 RBC 1 PMN is reduced

Fluid Type	Ref Range & Units	1 mo ago Peritoneal
Fluid WBC mm3 Comment: No reference range established.	mm3	612
Fluid RBC mm3 Comment: No reference range established.	mm3	25
Neutrophils Fluid % Comment: No reference range established.	%	58
Lymphocytes Fluid % Comment: No reference range established.	%	5
Macrophages Fluid % Comment: No reference range established.	%	37
Fluid Number of Cells Counted		100
Other Cells Fluid %		

FLUID	1 4/29/21 1620
Fluid Type	Peritoneal
Fluid WBC mm3	3,069 *
Fluid RBC mm3	2,216,000 *
Neutrophils Fluid %	56 *
Myelocytes Fluid %	0 *
Metamyelocytes Fluid %	0 *
Promyelocytes Fluid %	0 *
Blasts Fluid %	0 *
Lymphocytes Fluid %	1 *
Eosinophils Fluid %	0 *
Basophils Fluid %	0 *
Macrophages Fluid %	40 *
Mesothelial Cells...	3 *
Malignant Fluid %	0 *
Synovial Lining Ce...	0 *
Plasma Fluid %	0 *
Other Cells Fluid %	0 *
Fluid Number of Ce...	100
BODY FLUID PATH RE...	

Fluid Type	Ref Range & Units	1 mo ago (6/8/21) Peritoneal
Fluid WBC mm3 Comment: No reference range established.	mm3	317
Fluid RBC mm3 Comment: No reference range established.	mm3	47
Neutrophils Fluid % Comment: No reference range established.	%	32
Lymphocytes Fluid % Comment: No reference range established.	%	30
Macrophages Fluid % Comment: No reference range established.	%	38
Fluid Number of Cells Counted		100
Other Cells Fluid %		

# SBP Prophylaxis

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- Active GI bleed in Cirrhotic – treat with 7 days of antibiotics
- History of SBP – should be on Prophylaxis
- Ascites with low protein and decompensated cirrhosis (childs-pugh score 9+), Bilirubin >3, renal dysfunction (BUN >25, CTR> 1.2, Na<130)
- Common agents Ciprofloxacin or Bactrim

# Importance of Diagnostic Paracentesis

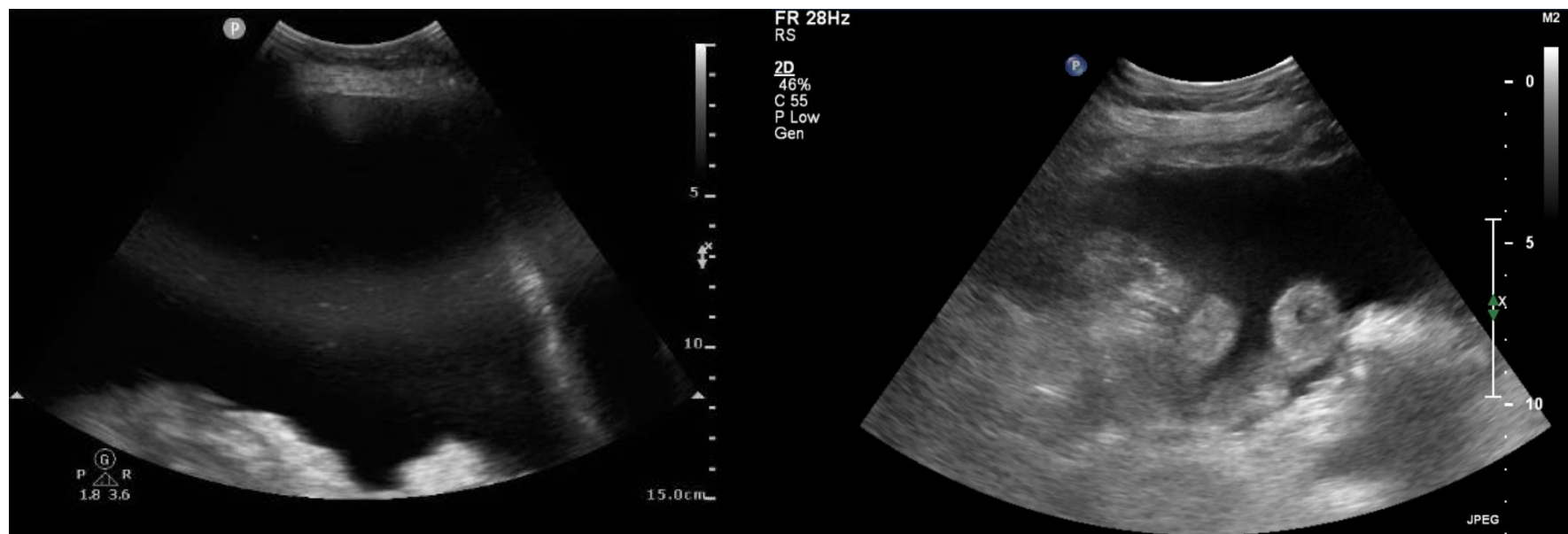
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Large retrospective study of approximately 75,000 patients found that early paracentesis (within 24 hours of admission) was associated with reduced inpatient mortality. SBP related mortality and 30-day readmission

# Ultrasound Examination for Paracentesis

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- Should have large anechoic (black) portion of image
- Fluid and structures move with respiration do you have a moving target, any critical structures near your target
- Ensure no blood vessels visible on ultrasound of abdominal wall for planned puncture,
- Often modified Seldinger technique is used for therapeutic paracentesis and the catheter over the needle has multiple side holes
- A needle can be used for diagnostic paracentesis





# Large Volume Paracentesis

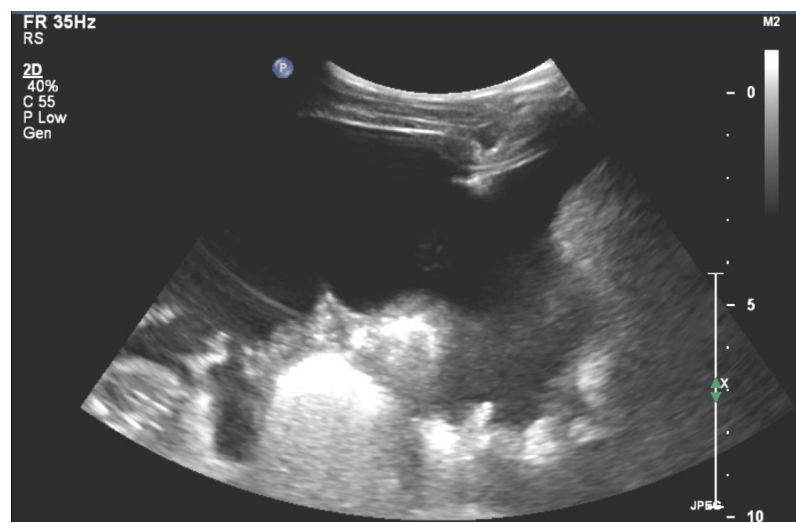
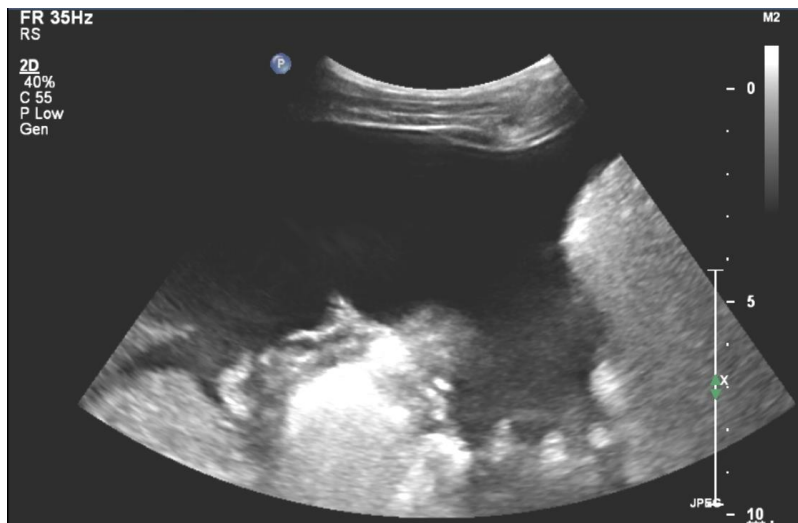
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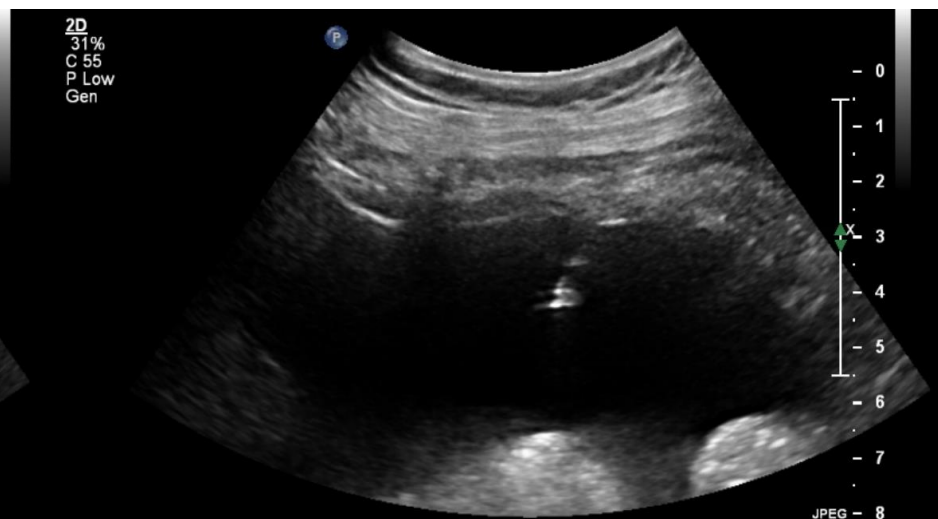
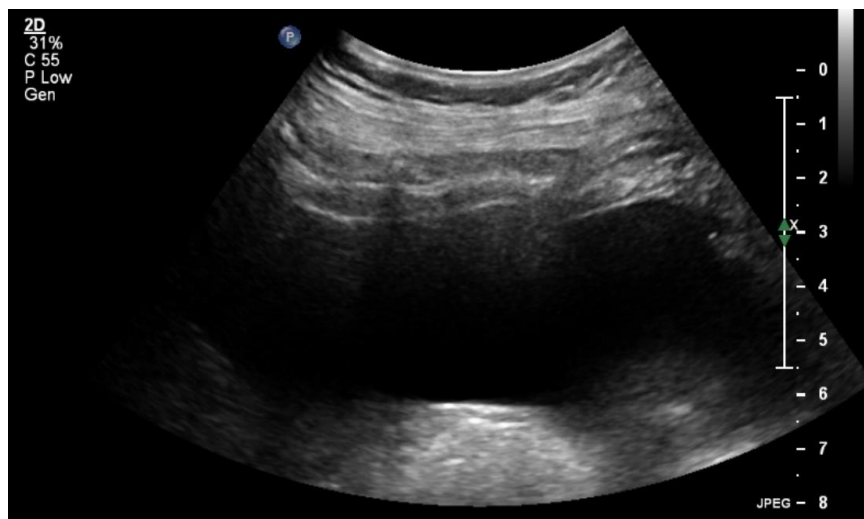
- Albumin is required if over 5 Liters is removed to reduce risks including of post paracentesis circulatory dysfunction can results in renal impairment, HRS or even death
- 6-8 G of albumin per liter of ascites removed
- post paracentesis circulatory dysfunction risk increases with removal over 8 liters

# Steps for a Paracentesis

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- Obtain Consent
- Ultrasound examination/site marking
- Prep and drape site using sterile technique
- Administer local anesthesia
- Insert needle or catheter for paracentesis.
  - Advance slowly to minimize risk of bowel perforation
  - Realtime ultrasound guidance can be considered
- After collection of sample remove access set





# Leaking Post Paracentesis

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- Pressure dressings may not stop leaking
- Ostomy bag for fluid collection
- Management of diuretics to reduce ascites accumulation may help
- Skin glue such as Dermabond, blood patch or even suturing of the site may be needed



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**Thank You**