American College of Physicians - Internal Medicine Meeting 2024
Boston, MA

POCUS for Beginners

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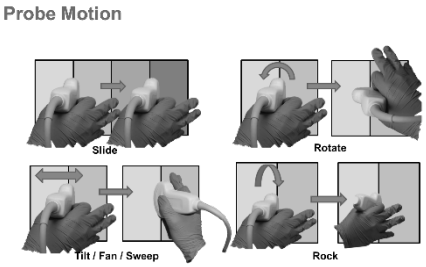
Resources Handout

Ultrasound Basics



Indications

- To assess etiology of undifferentiated shock, dyspnea, or chest pain
- To assess response to treatment
- Should be combined with **history and physical examination**
- Remember for every exam: **Probe, Presets, Patient Position**

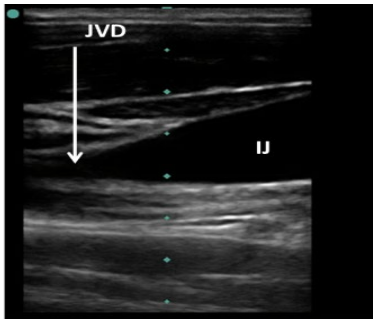
Selected Resource for Physical Examination diagnostic performance:

- McGee, Steven. Evidence-based physical diagnosis e-book. Elsevier Health Sciences, 2021.
- Narula, Jagat, Y. Chandrashekhar, and Eugene Braunwald. "Time to add a fifth pillar to bedside physical examination: inspection, palpation, percussion, auscultation, and insonation." JAMA cardiology 3.4 (2018): 346-350.

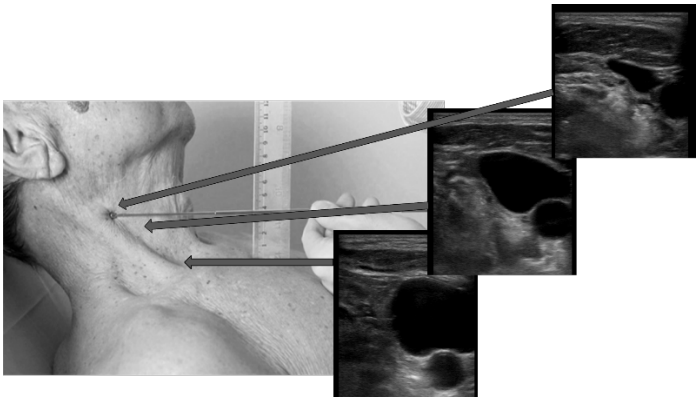
POCUS JVD

- **Probe(s)**: linear probe, **Preset:** Venous, Superficial, **Position:** Patient upright or angled
- Using light pressure on the probe, identify the **internal jugular** in the **longitudinal plane** by finding the **internal jugular** in the **transverse plane** and then **rotating** the probe so the **indicator is cranial**
- Acquire an image in which the **internal jugular** narrows into a "**paintbrush**" appearance
- The height where the **internal jugular** tapers correlates with **jugular venous distention**

Hand Position



Longitudinal View



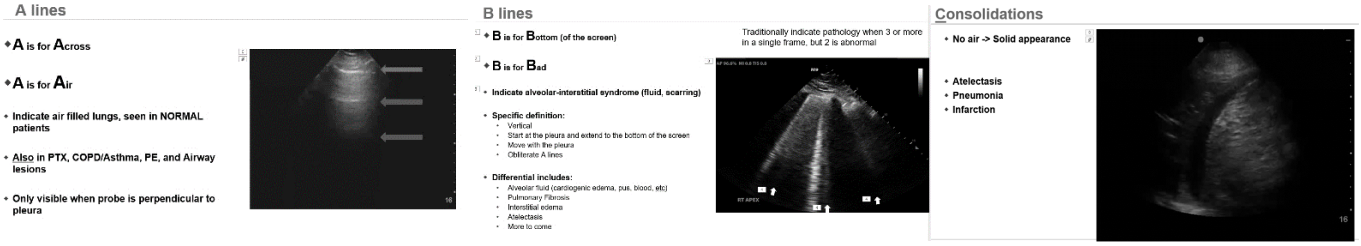
Transverse view at different levels

Selected Resources:

- Wang, Libo, et al. "Accuracy of Ultrasound Jugular Venous Pressure Height in Predicting Central Venous Congestion." Annals of internal medicine (2021).
- Brennan, J. Matthew, et al. "A comparison by medicine residents of physical examination versus hand-carried ultrasound for estimation of right atrial pressure." The American journal of cardiology 99.11 (2007): 1614-1616.

Pulmonary POCUS

- **Indicated** for **dyspnea** or **respiratory failure**
- **Probe(s)**: Any, but body or curved, **Preset:** Lung, **Position:** Patient upright or supine
- Anchor hand on skin. Ensure perpendicularity to pleural. I**ndicator is cranial**
- Identify Anchoring anatomy: **Rib, Pleura Rib**
- Put together pattern of A, B, and C into clinical picture



Selected Resources:

- Volpicelli, Giovanni, et al. "International evidence-based recommendations for point-of-care lung ultrasound." Intensive care medicine 38.4 (2012):
- Tierney, David M., et al. "Comparative performance of pulmonary ultrasound, chest radiograph, and CT among patients with acute respiratory failure." Critical care medicine 48.2 (2020): 151-157.
- Gargani, Luna, and Giovanni Volpicelli. "How I do it: lung ultrasound." Cardiovascular ultrasound 12.1 (2014): 1-10.
- Baston, Cameron, and T. Eoin West. "Lung ultrasound in acute respiratory distress syndrome and beyond." Journal of Thoracic Disease 8.12 (2016): E1763.

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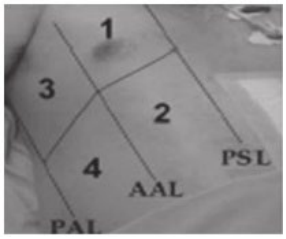
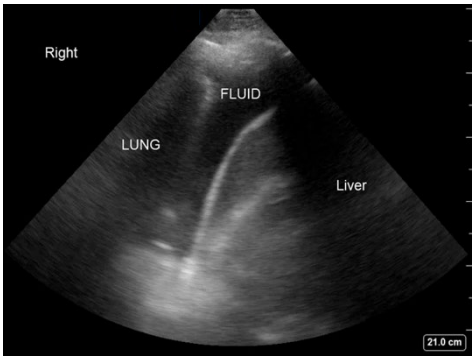
Resources Handout

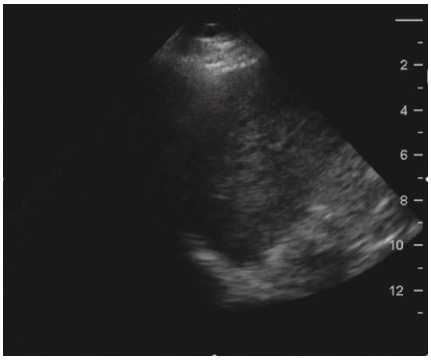
Pleural Ultrasound for Effusion



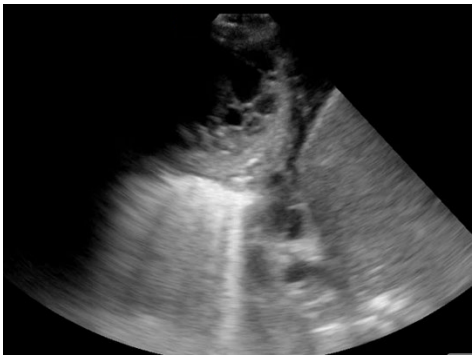
- **Indicated** for **dyspnea** or **respiratory failure**
- **Probe(s)**: Phased or curved, **Preset:** Abdomen, **Position:** Patient upright or supine
- Anchor hand on skin. Place at Zone 4 / Base of lung. I**ndicator is cranial**
- Identify Anchoring anatomy: **Diaphragm, Liver or Spleen, Lung**
- Identify **Lung Curtain** or **Effusion**
- Look for **Loculations**



Labeled Anatomy Small Effusion



Lung Curtain (no Effusion)



Loculated effusion

Selected Resources:

- Cotton, Darrel William, et al. "Point of Care Ultrasound for the General Internist: Pleural Effusions." Canadian Journal of General Internal Medicine 13.2 (2018).
- Liu, Rachel B., et al. "The practice and implications of finding fluid during point-of-care ultrasonography: a review." JAMA internal medicine 177.12 (2017): 1818-1825.
- Shkolnik, Boris, et al. "Diagnostic accuracy of thoracic ultrasonography to differentiate transudative from exudative pleural effusion." Chest 158.2 (2020)

Pulling it all together

- POCUS requires knowledge of **Indications, Image Acquisition, Image Interpretation, and Clinical Integration**
- Diagnostic performance in isolation is superior to physical exam and chest radiograph, but the strength of POCUS is that it is **never used in isolation of other clinical findings**
- People serious about POCUS **save their images for portfolio review**
- Combining multiple POCUS exams is essential for high quality information

JVD	Lungs	Pleura	Diagnoses
-	A lines	Lung Curtain	Normal COPD Asthma
+	**B lines**	**+/- Effusion**	CHF
+	A lines	Lung Curtain	DVT PE Tamponade
-	**A / B or Consolidation**	**+/- Effusion**	Pneumonia
-/+	**A lines / Consolidation**	**Large Effusion**	Pleural effusion

Example of combining multiple examination

Selected Resources:

- Díaz-Gómez, José L., Paul H. Mayo, and Seth J. Koenig. "Point-of-care ultrasonography." New England Journal of Medicine 385.17 (2021): 1593-1602.
- Qaseem, Amir, et al. "Appropriate use of point-of-care ultrasonography in patients with acute dyspnea in emergency department or inpatient settings: a clinical guideline from the American College of Physicians." Annals of internal medicine 174.7 (2021): 985-993.
- Wagner, Mike, Keith R. Barron, and Renee Dversdal. "Internal Medicine Point of Care Ultrasound: Indicators It's Here to Stay." Journal of general internal medicine 34.10 (2019): 1956-1958.
- Bhagra, Anjali, et al. "Point-of-care ultrasonography for primary care physicians and general internists." Mayo Clinic Proceedings. Vol. 91. No. 12. Elsevier, 2016.
- Soni, Nilam J., et al. "Point-of-care ultrasound for hospitalists: a position statement of the Society of Hospital Medicine." Journal of hospital medicine 14 (2019): E1.

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