

Not HOCUS POCUS: Bedside U/S for Addiction Medicine

Michael Baca-Atlas, MD, FASAM
Tom Robertson, MD FACP

ASAM Annual Conference 2024
April 6, 2024 | 1:15-2:30 pm



Disclosure Information

- ◆ Presenter 1: Michael Baca-Atlas, MD, FASAM
 - ◆ No Disclosures
- ◆ Presenter 2: Tom Robertson, MD, FACP
 - ◆ No disclosures



2015



2013

Learning Objectives

- **Appraise POCUS as an important modality in addiction medicine practice by reviewing POCUS' benefits, fundamentals/definitions, and data supporting its use.**
- **Identify 3 clinical scenarios where POCUS can aid the clinician in diagnosis and medical decision making in the ambulatory setting focusing on common issues when caring for individuals with substance use disorders.**
- **Identify conferences and modules that further support POCUS education and discuss next steps for future bedside ultrasound learning at ASAM conferences.**

Poll #1

- ◆ How many clinicians in this room use ultrasound as part of their medical practice?



Poll #2

- ◆ How many clinicians in this room use ultrasound as part of their **addiction medicine** practice?



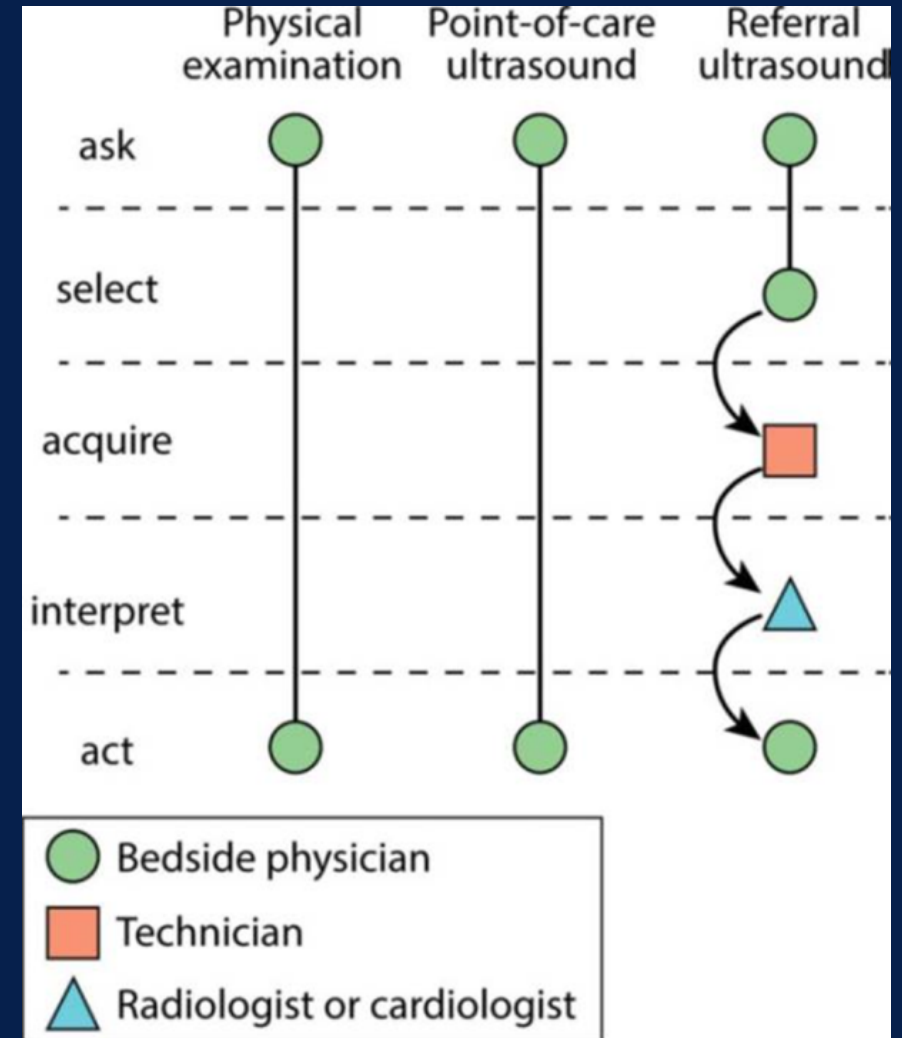
What is POCUS?

- ◆ Use of ultrasound at the bedside
- ◆ Answer focused clinical questions
- ◆ Integrated with history and physical
- ◆ Multiple body systems
- ◆ Repeatable



Flow

- ◆ Increased provider satisfaction
- ◆ Increased patient satisfaction
- ◆ Addresses health inequities



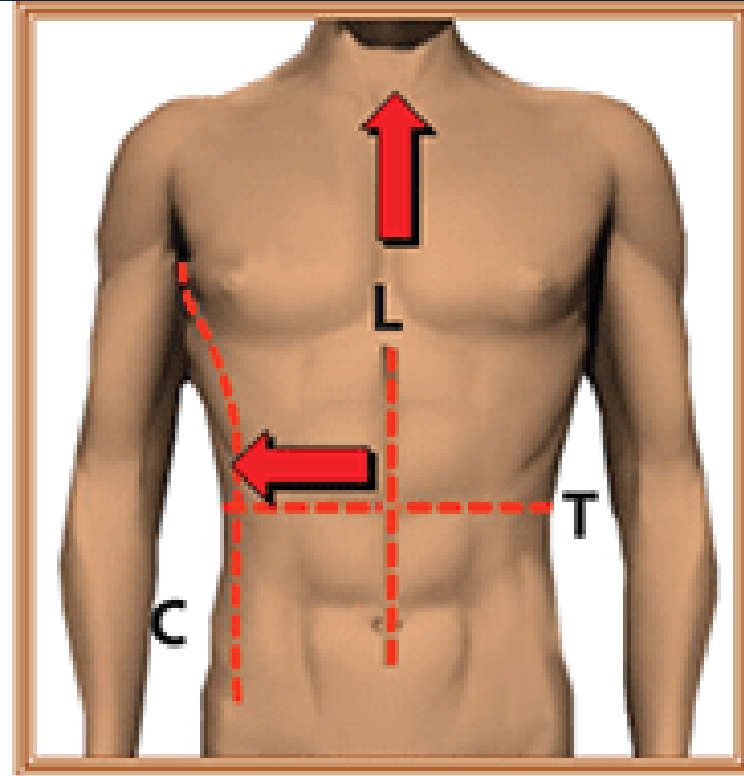
General Principles

- ◆ Predetermined set of qualitative objectives
 - ◆ Is there an abscess?
 - ◆ Is the bladder distended?
 - ◆ Are the lungs wet or dry?
- ◆ Know limitations
- ◆ Integrate with other data to inform care

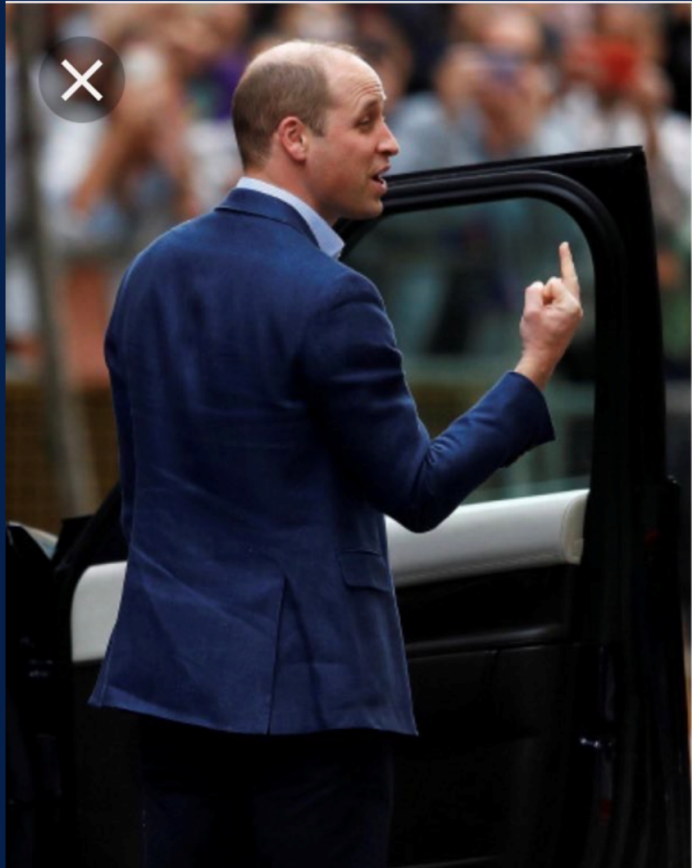
Fundamentals – Hand Placement



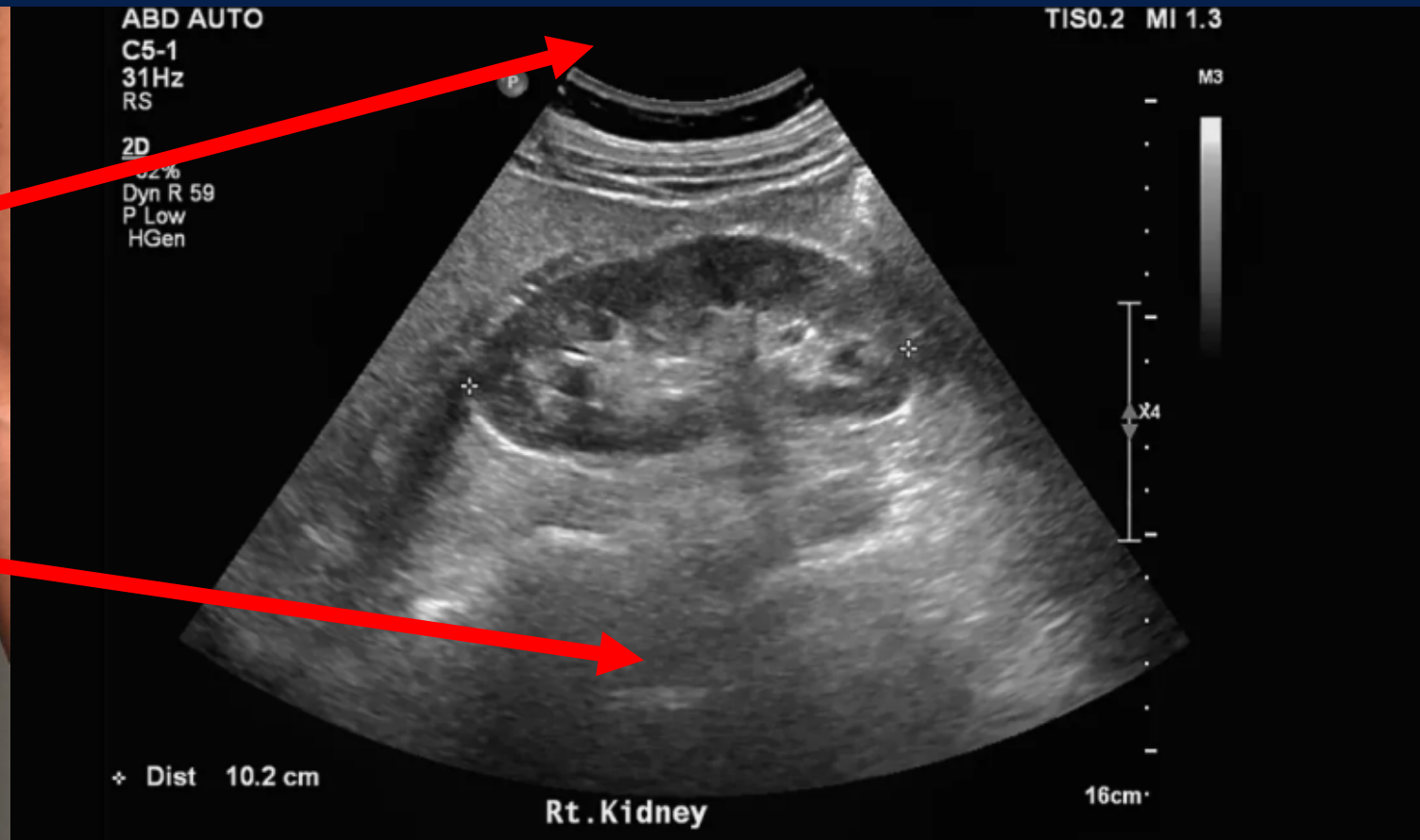
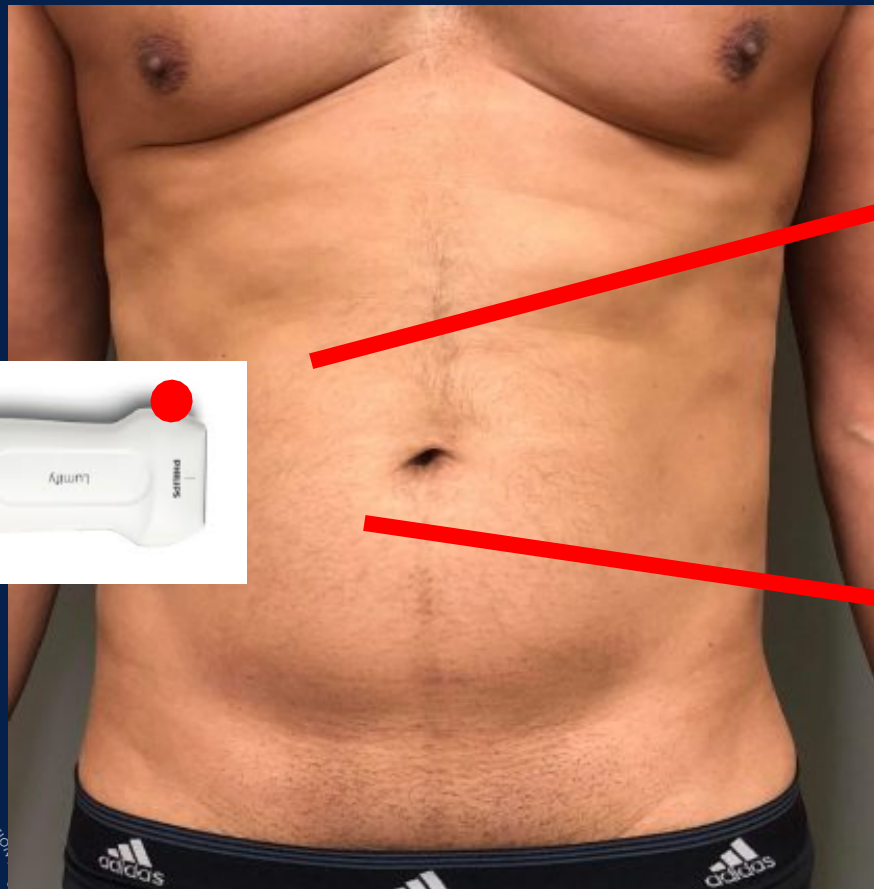
Probe Orientation



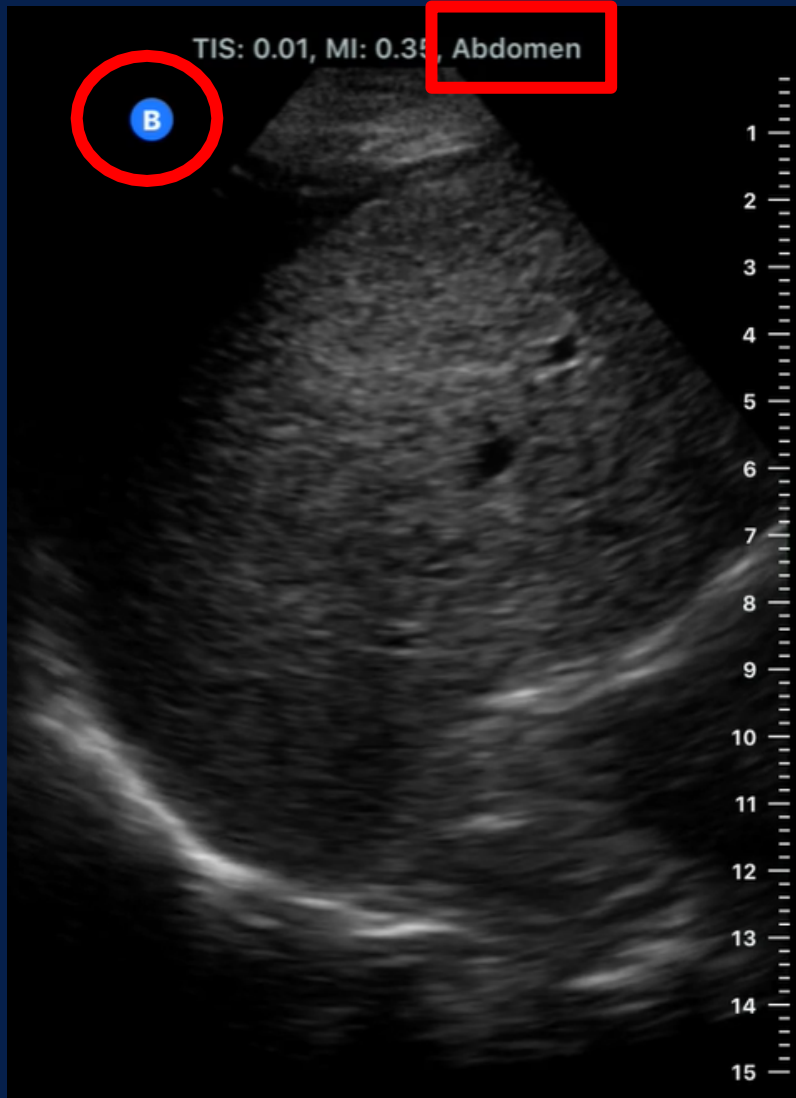
More than 1 View...



What's on the Screen



Presets

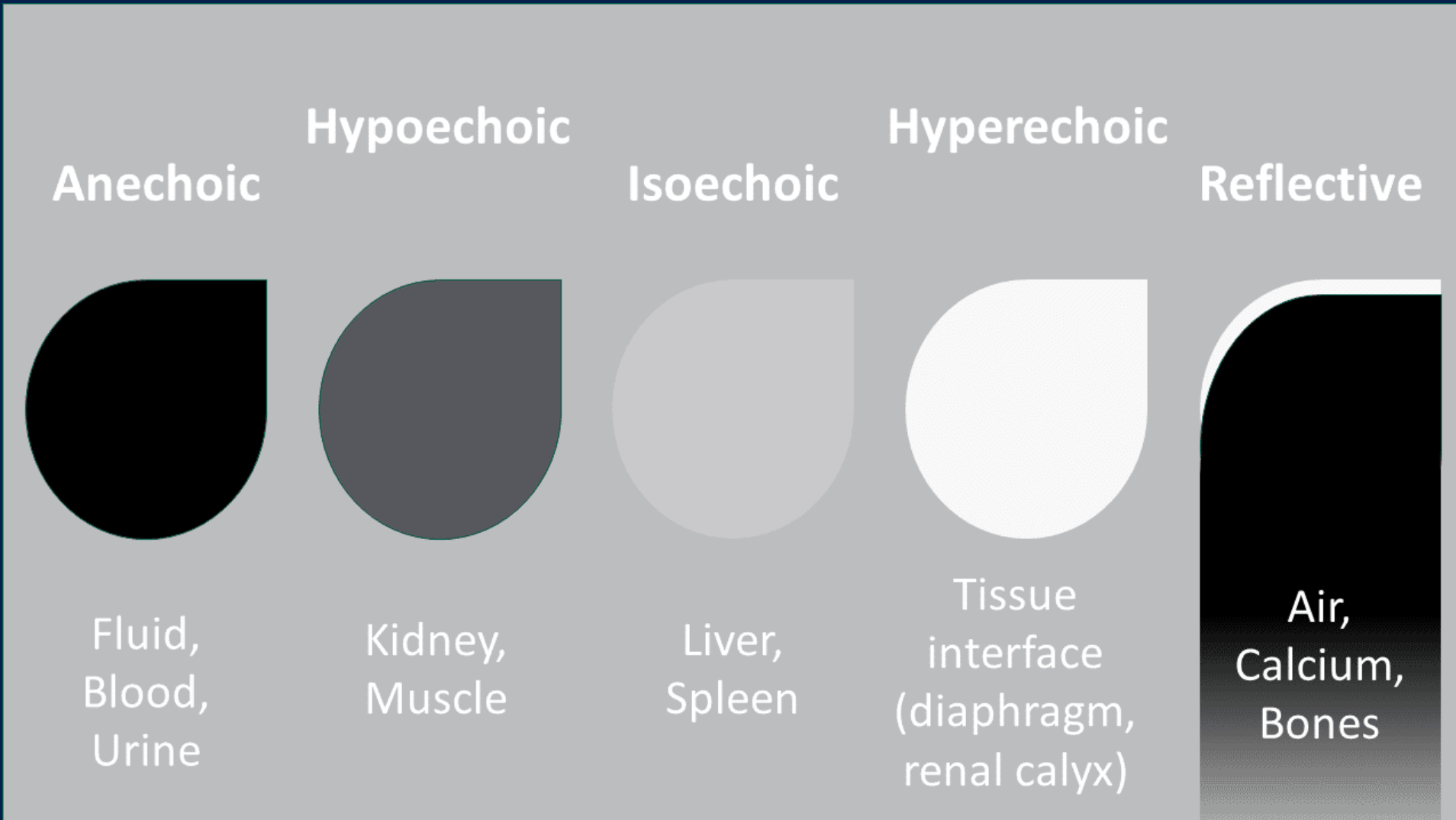


Probe Selection

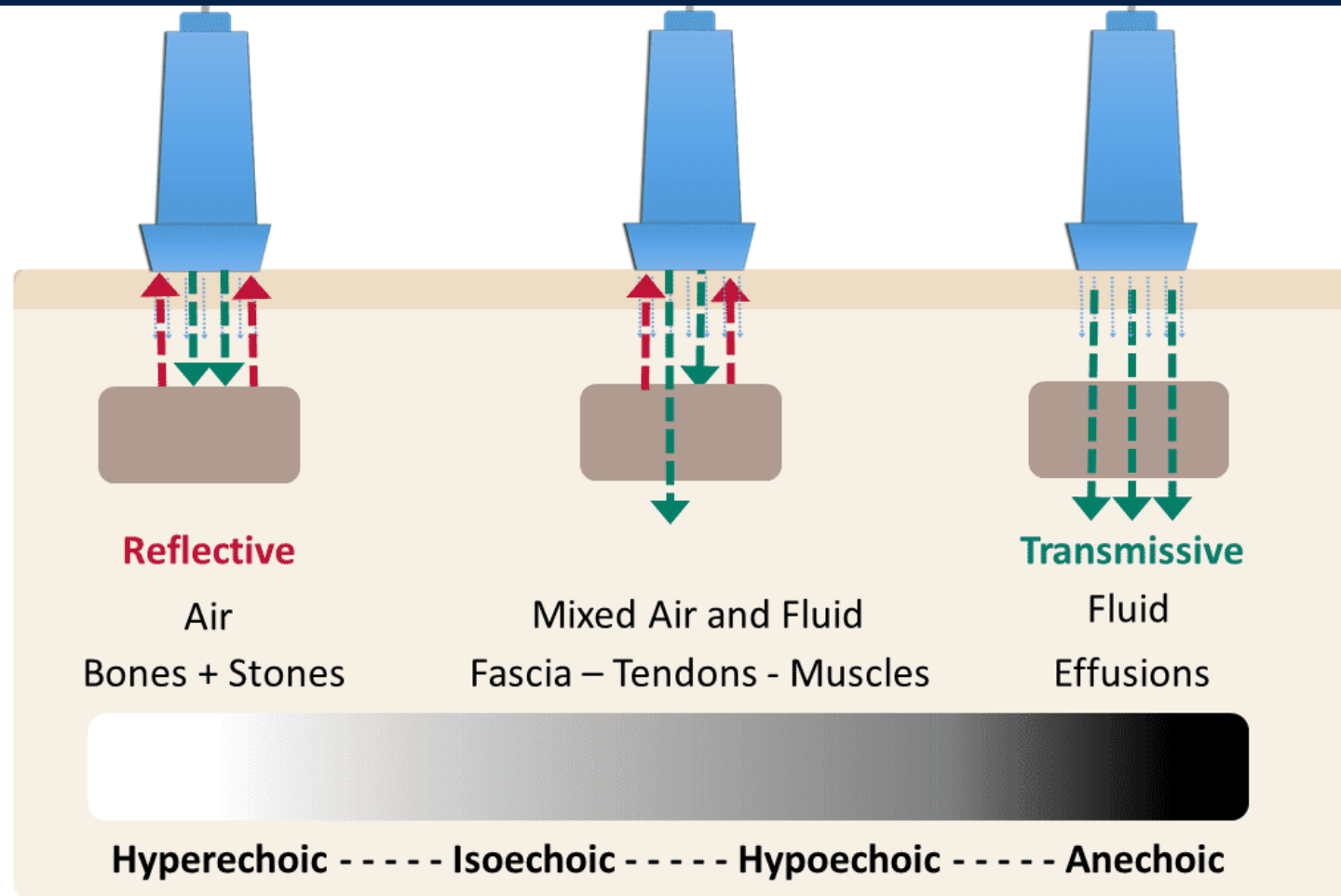
- ◆ **Linear**
 - ◆ Superficial structures (vessels, skin/soft tissue, pleura)
- ◆ **Curvilinear**
 - ◆ Deeper structures (abdomen, lung, deeper structures)
- ◆ **Phased Array**
 - ◆ Cardiac, 'do it all'
- ◆ **Handheld**
 - ◆ All in one



Grey Scale



Grey Scale



Data

◆ Accuracy

- ◆ Changed primary diagnosis in 20% of cases with 5 min of POCUS use
- ◆ Cardiac pathology identified 82% with POCUS vs 47% with physical exam
- ◆ Reduction in procedural complications (ex. 19% reduction in pneumothorax)

Data

- ◆ Accuracy
- ◆ Time
 - ◆ Decreased time to diagnosis 5h vs 24h
 - ◆ Improved diagnosis of decompensated HF: 5 vs 104 min
 - ◆ Improved time to accurate characterization of LV function by 18 hours
 - ◆ Diagnosis of DVT: 25min vs 11hours with 100% sens/spec

Data

- ◆ Accuracy
- ◆ Time
- ◆ **Resource Utilization**
 - ◆ Saved echo department 29% workload, with average cost savings ~\$200/patient
 - ◆ Decreased use of other inpatient diagnostic imaging tests (0.43/patient vs 1.29/patient without POCUS)
 - ◆ 63% of further testing deemed unnecessary, with <5% false negative rate
 - ◆ Decreased use of foley catheters

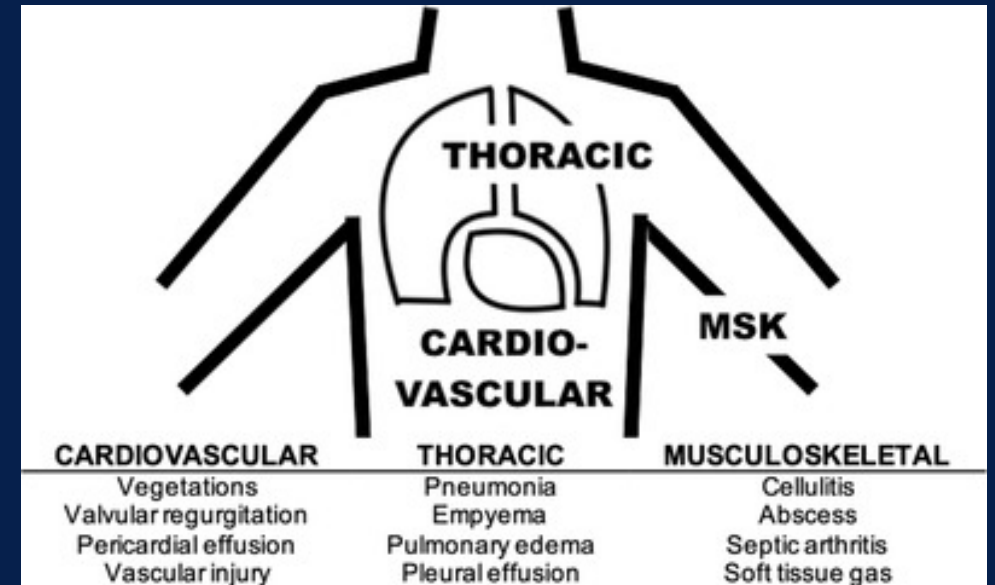
184 | POCUS J | NOV 2023 vol. 08 iss. 02

Research

Association of Internal Medicine Point of Care Ultrasound (POCUS) with Length of Stay, Hospitalization Costs, and Formal Imaging: a Prospective Cohort Study

Use of POCUS In Addiction Medicine

- ◆ 1 paper: CUPID protocol
 - ◆ Very challenging to do
 - ◆ Beyond scope of traditional POCUS
 - ◆ Inpatient focused



Overview of Cases

- ◆ 34 yo w/ pain, erythema and swelling at L antecubital fossa
- ◆ 55 yo w/ urinary retention and hesitancy
- ◆ 42 yo w/ cough, dyspnea and fever



Workshop: Case-Based Format

- ◆ Groups of 4-6 people
- ◆ Identify a team member to report out
- ◆ 4 minutes per break out (We'll keep time)



Case #1

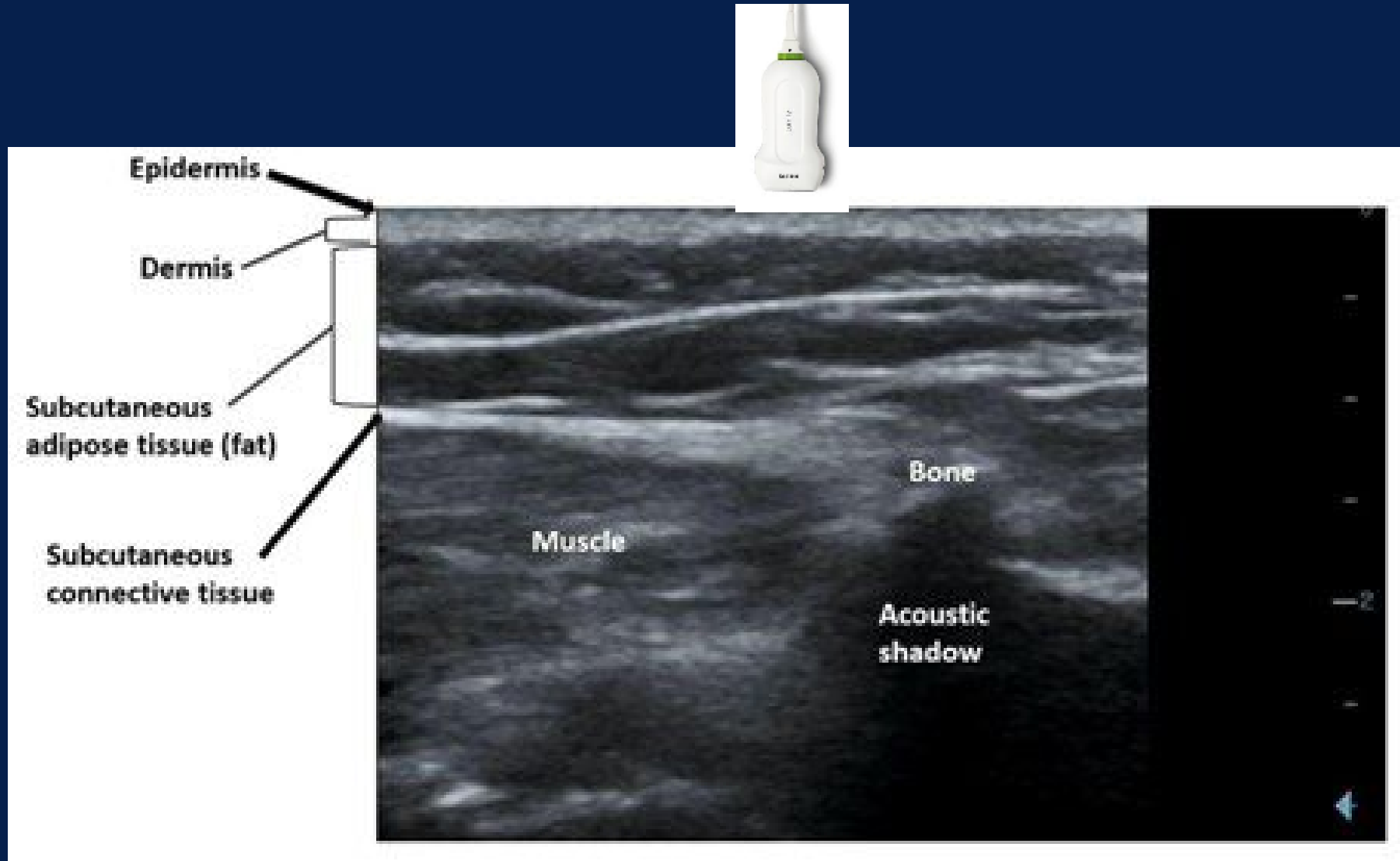
34 yo cis-gendered female presents to clinic with 3 days of pain/redness at the L antecubital fossa. Has had this numerous times in the same location and usually goes away with antibiotics. Reports daily IV cocaine use, often having to reuse needles.

Differential diagnosis? Next steps?

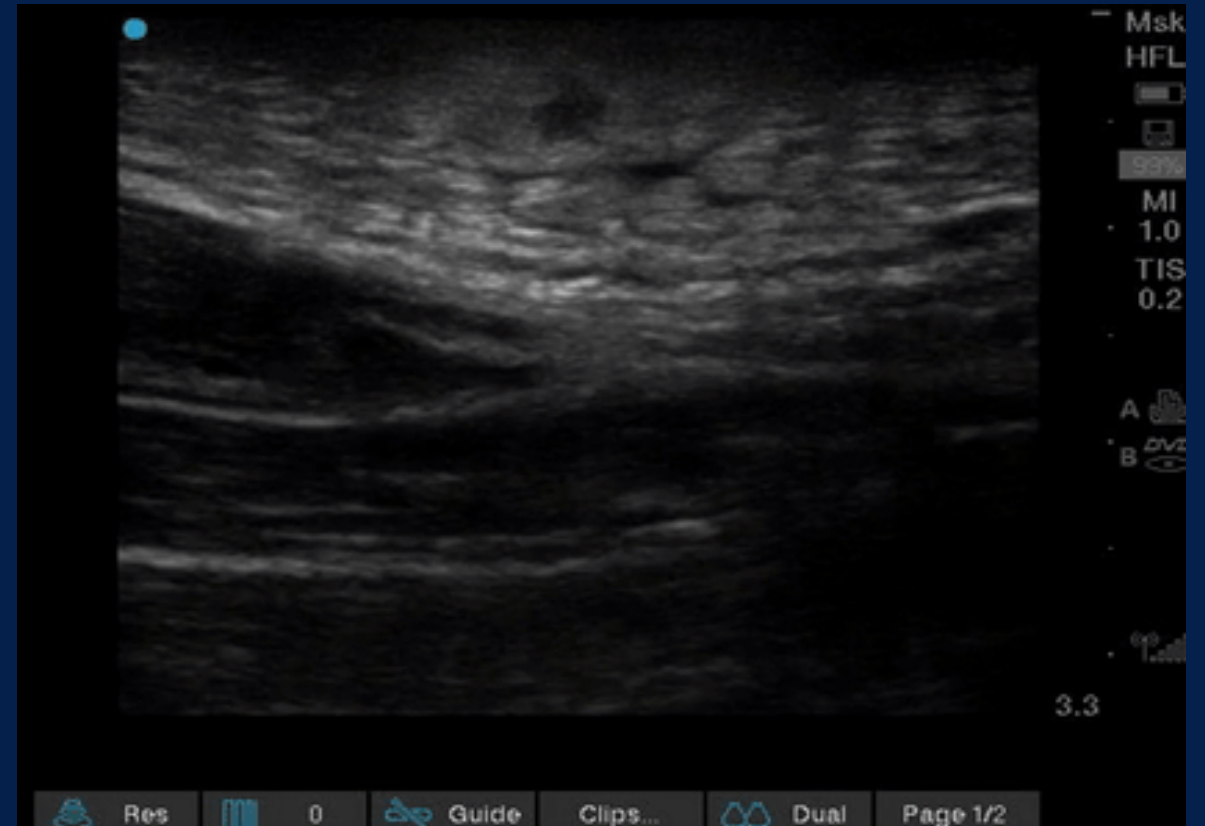
Skin and Soft Tissue



Normal Skin

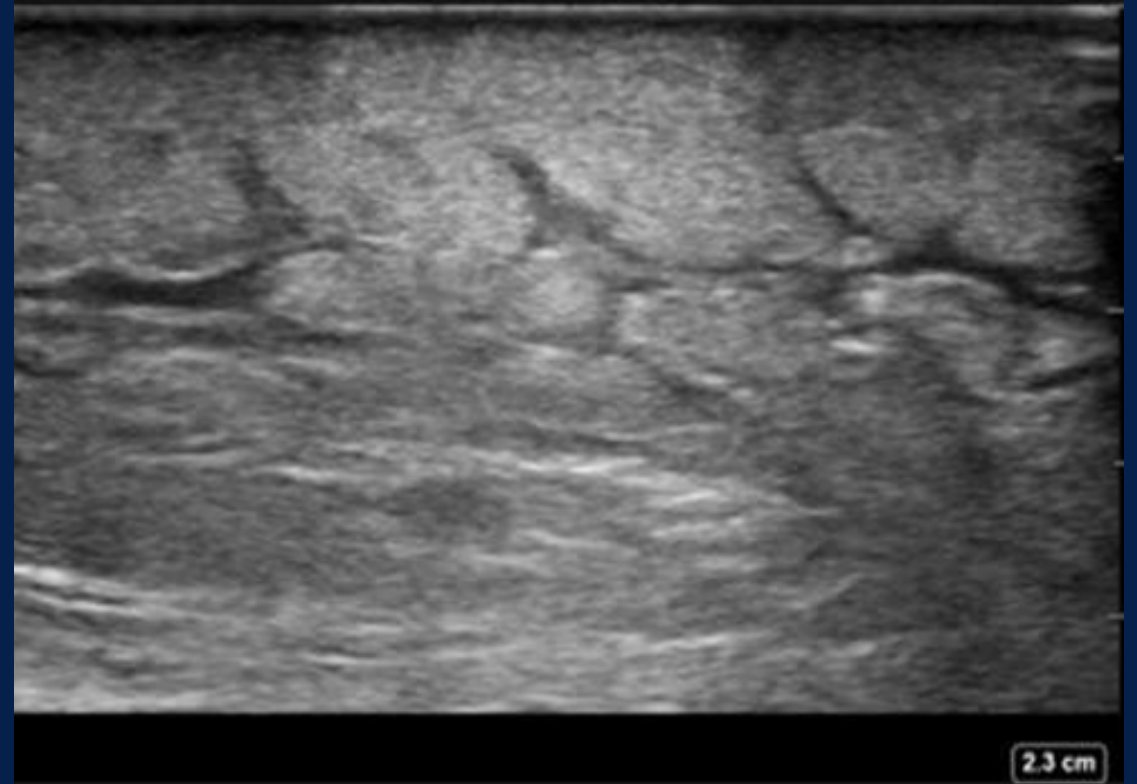
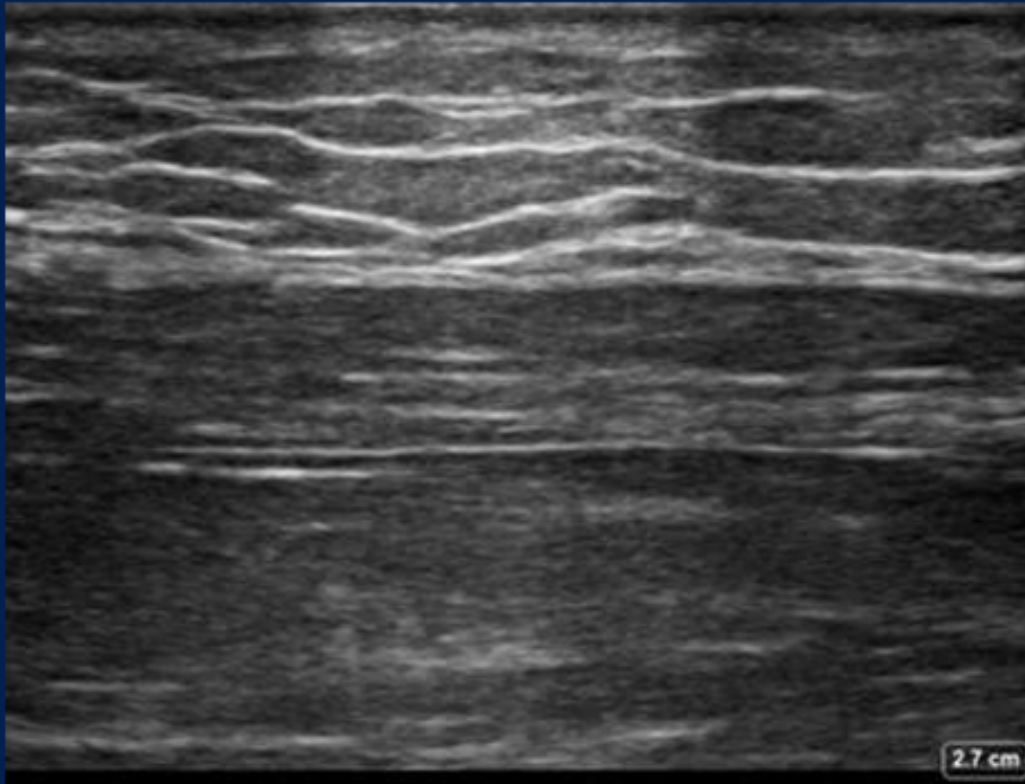


Cellulitis



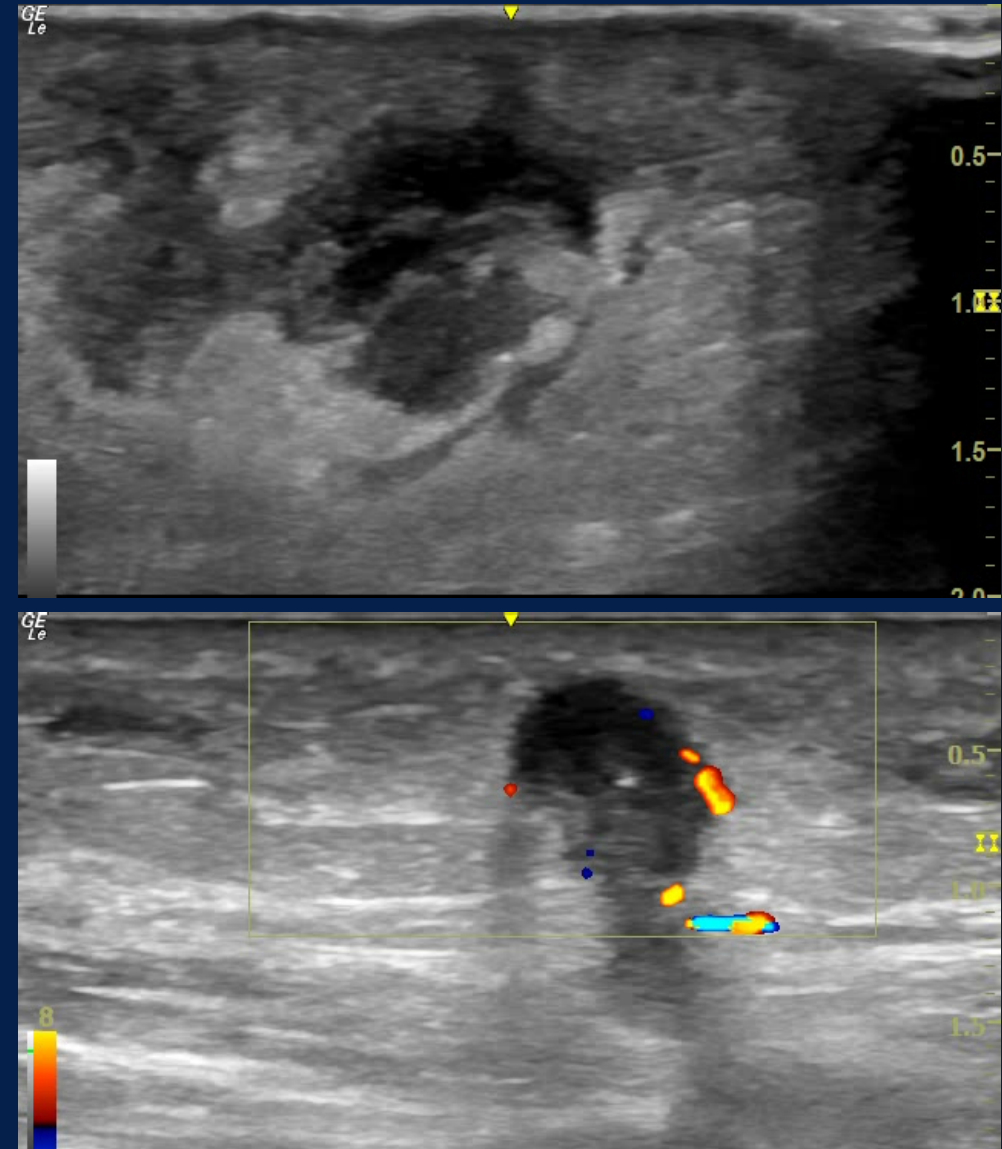
- ◆ Interstitial Fluid
- ◆ Cobblestoning

Normal vs Cellulitis

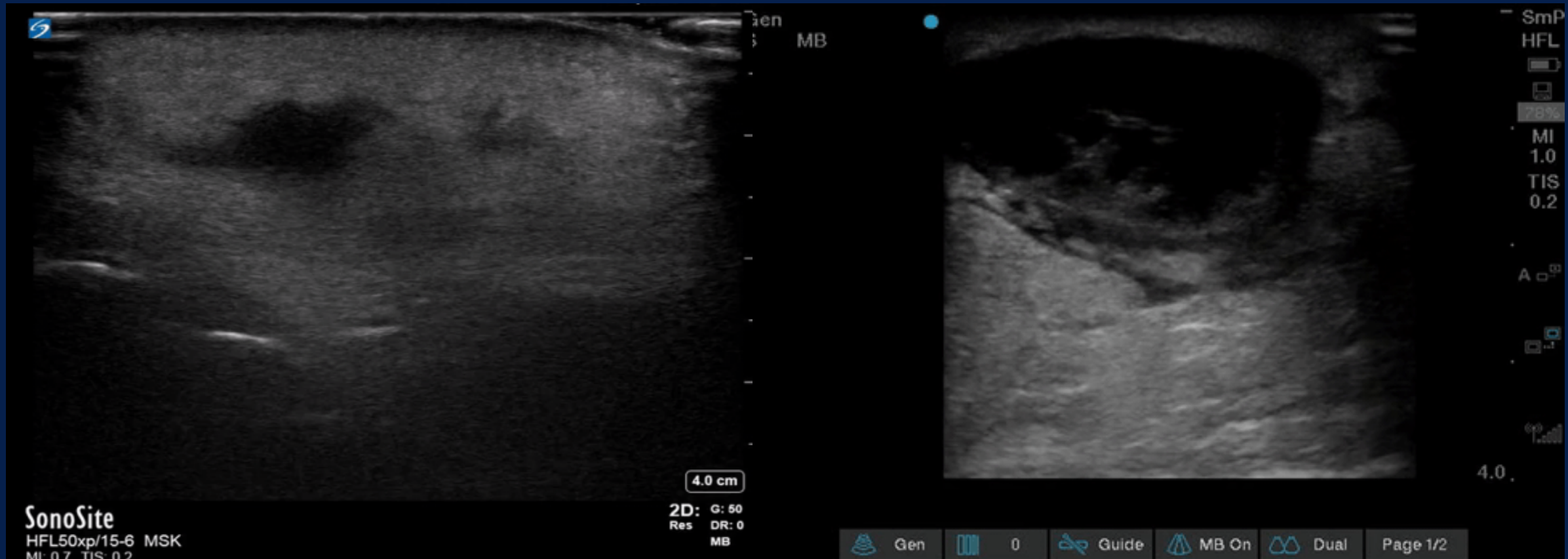


Abscess

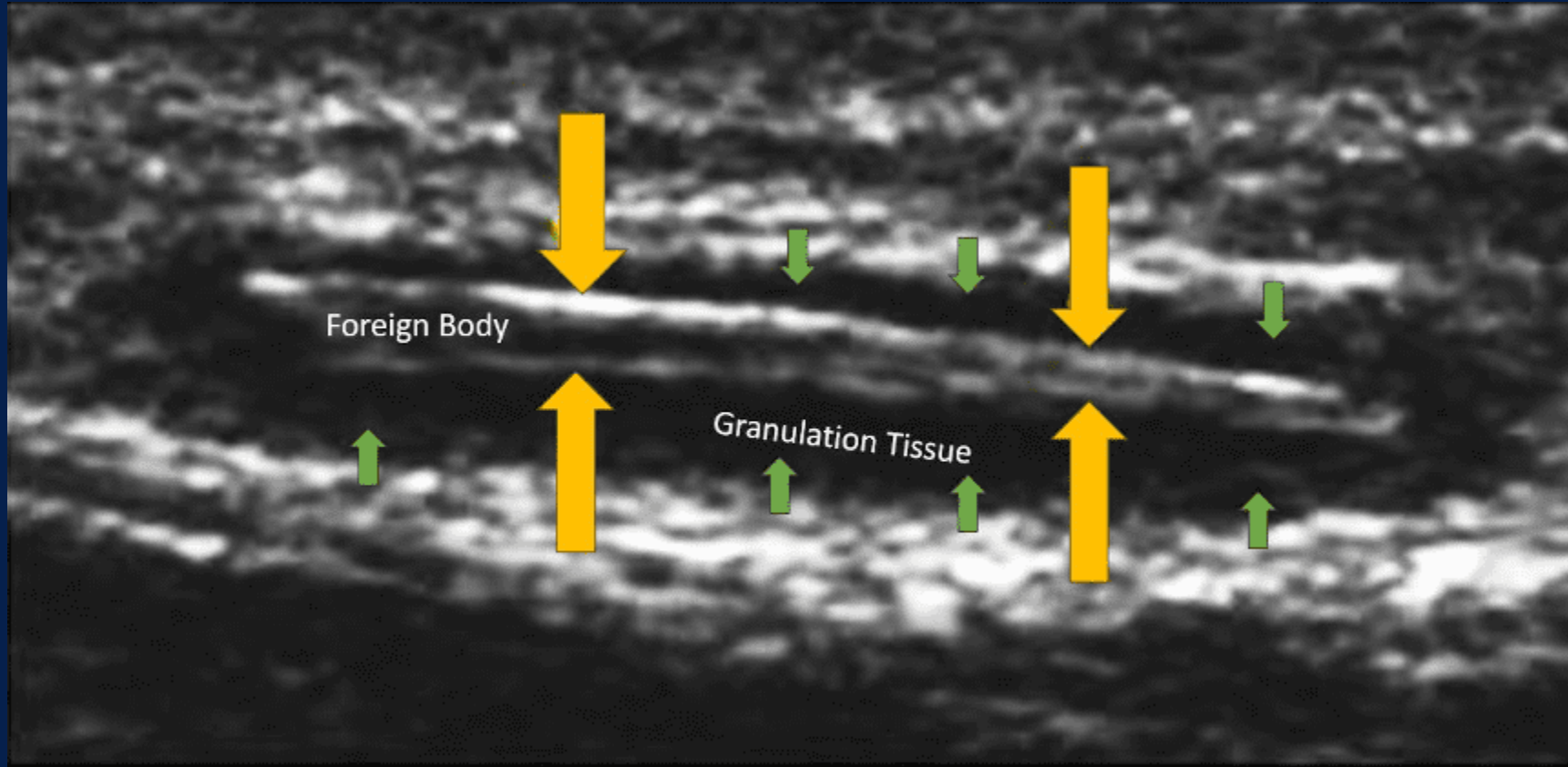
- ◆ Organized collection of fluid
- ◆ No color flow within the collection
- ◆ Hypervascularization (hyperemia) around the abscess
- ◆ Posterior acoustic enhancement



Abscess



Foreign Body

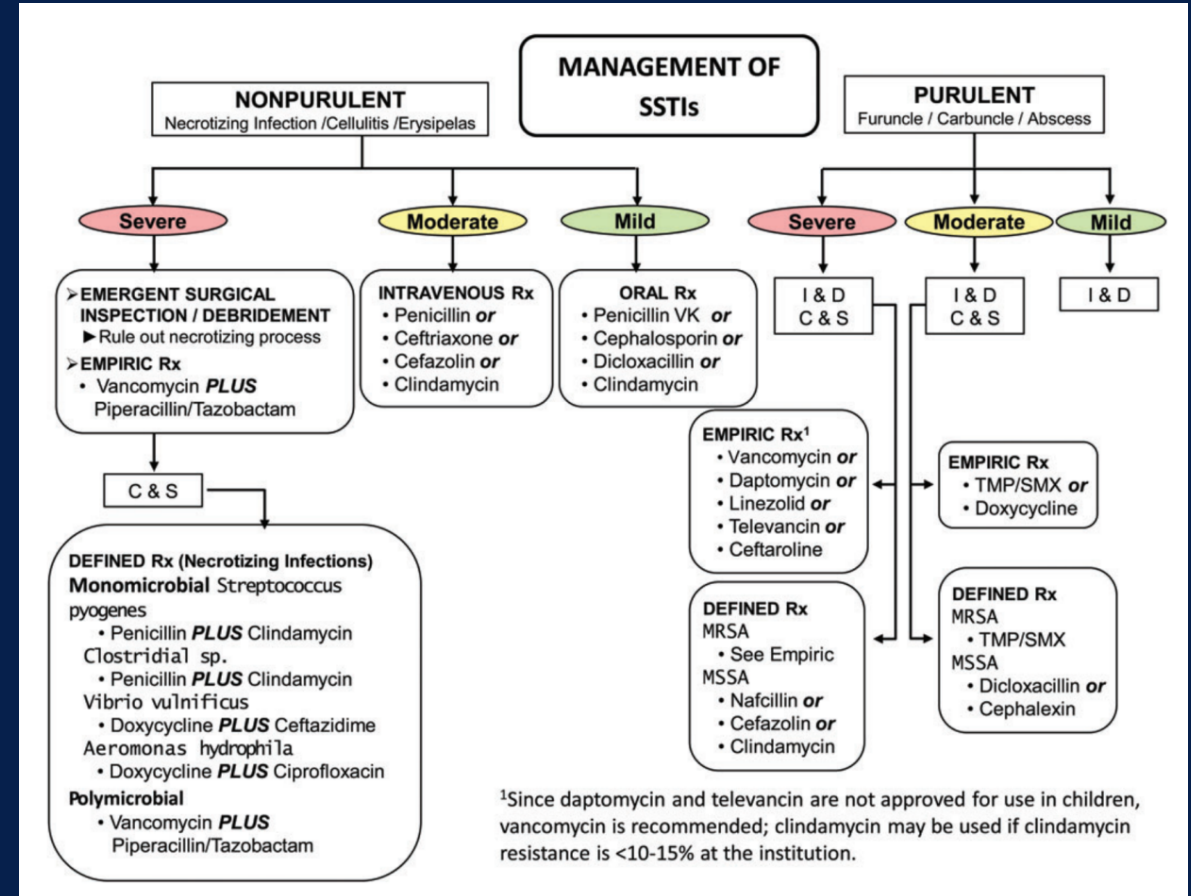


Glass in Skin



Cellulitis/Abscess Pearls

- ◆ Select highest frequency probe and preset
- ◆ Thick gel/water bath
- ◆ Scan deep and 'normal to normal'
- ◆ Always compare to normal side

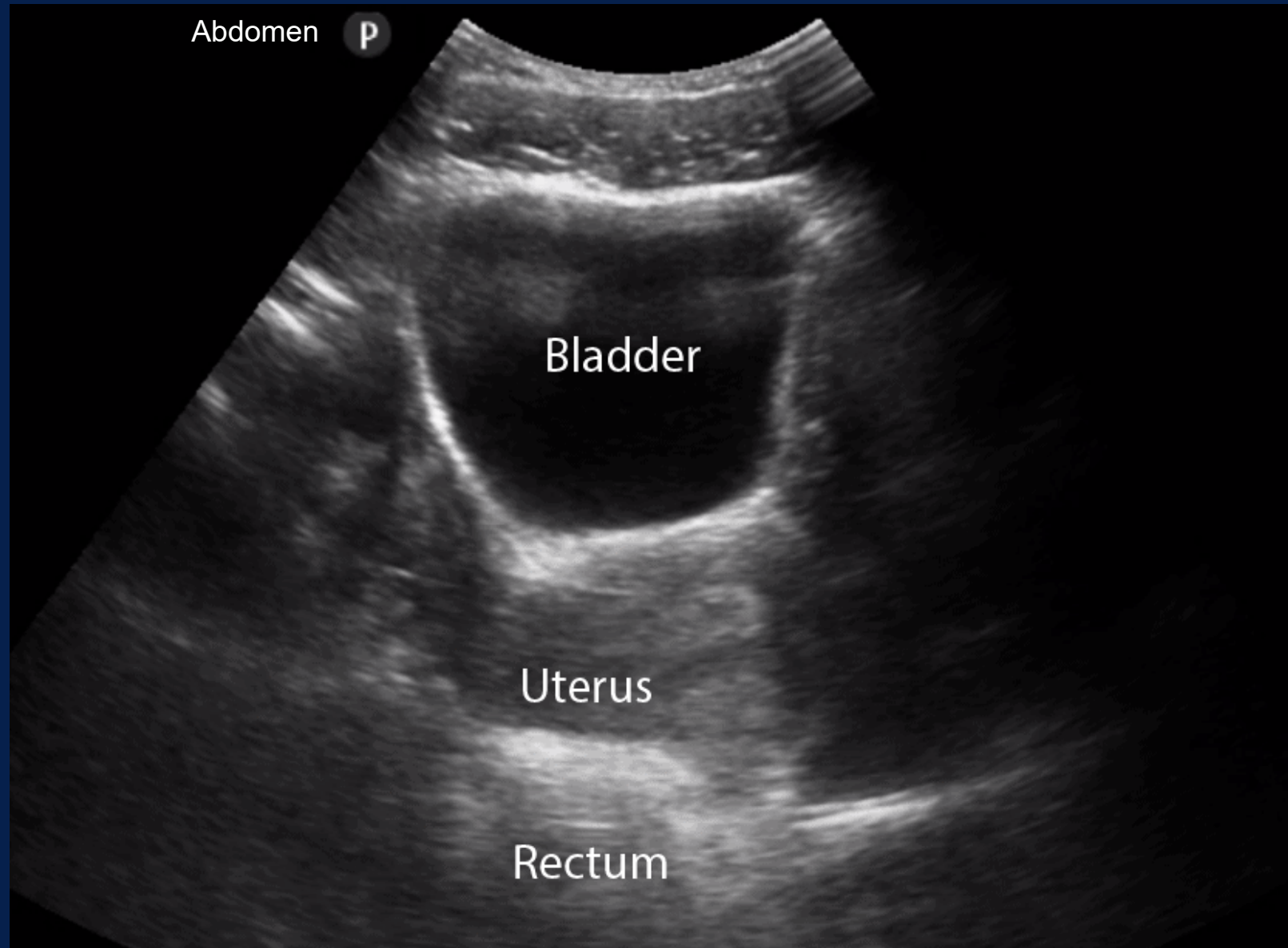


Case #2

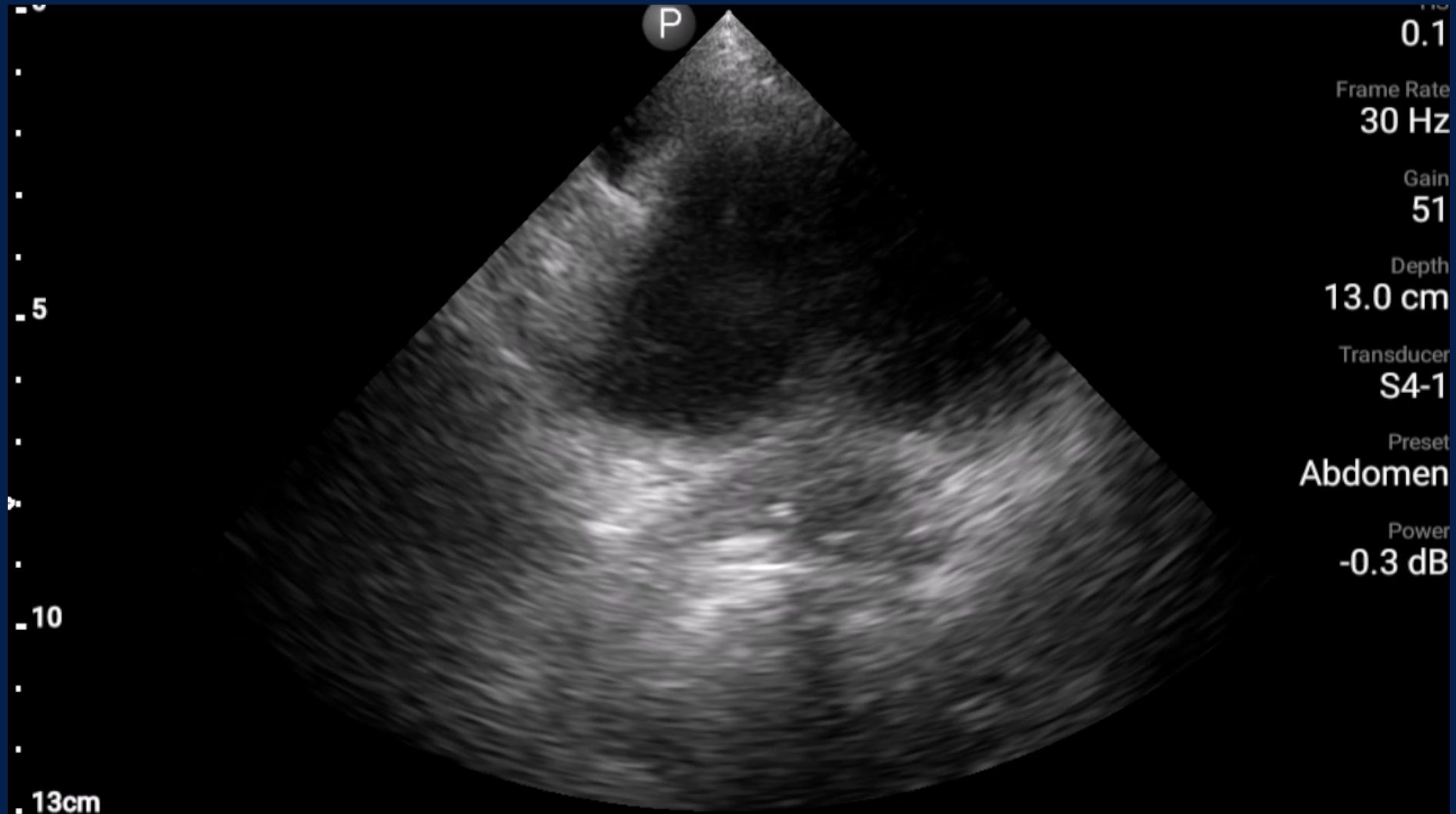
55 yo presents to clinic for urinary complaints including urinary retention and hesitancy. Hx of OUD on BUP-NX 8/2 mg TID, doing well. CC is “Urology referral” and they are uninsured w/ difficulty accessing specialty care.

- ◆ Name 2-3 things that are on your differential.

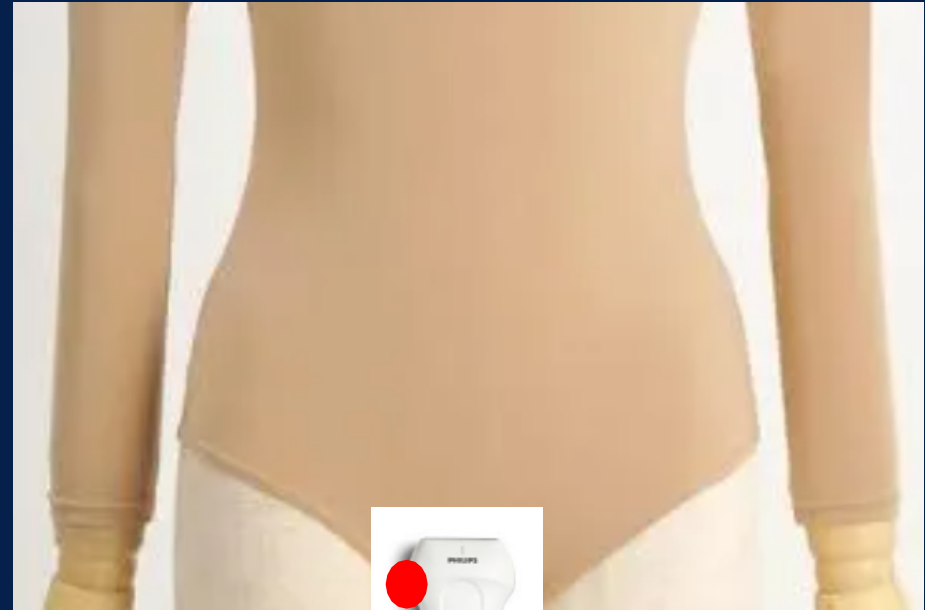
Bladder POCUS



Full Bladder

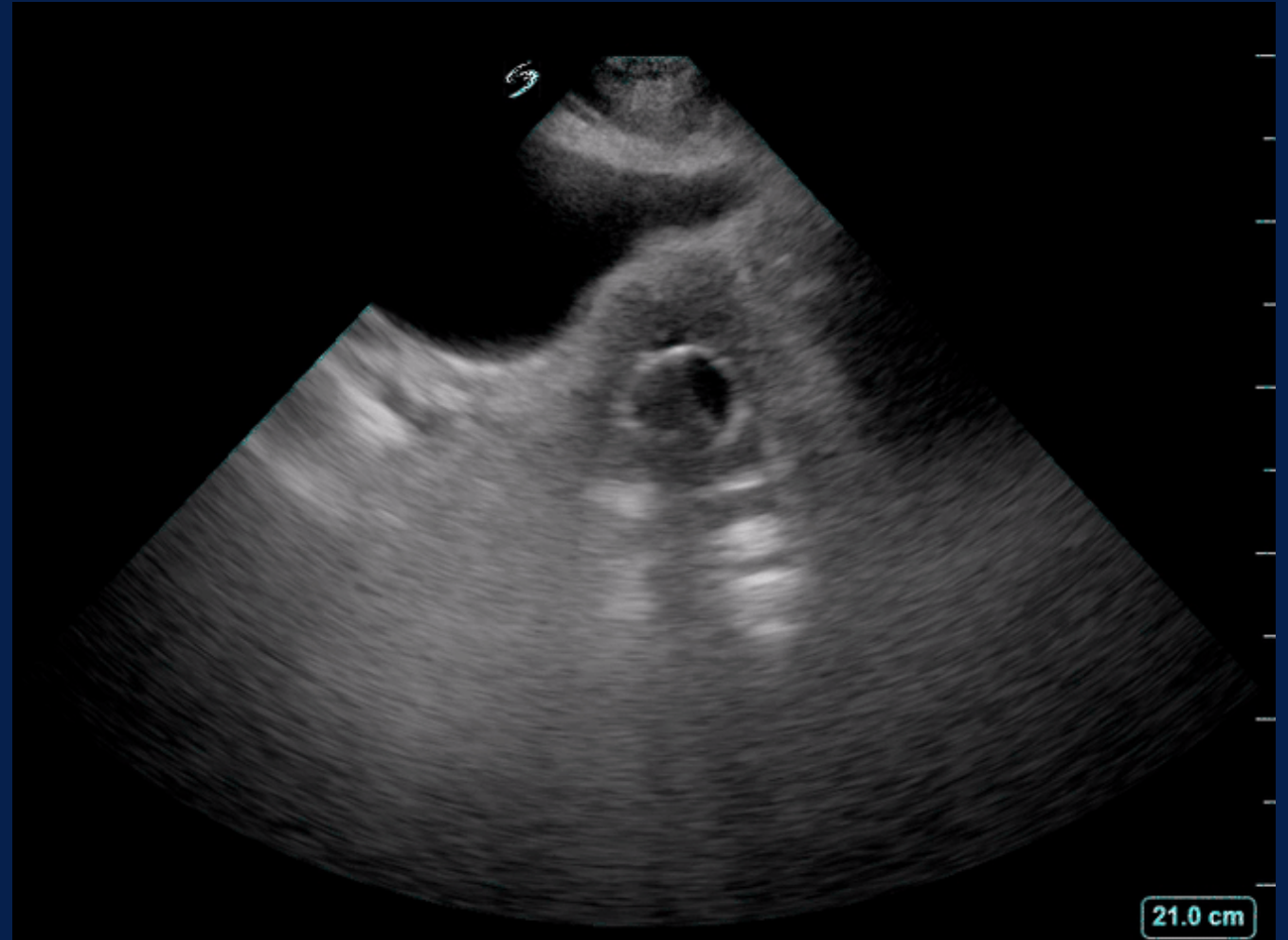


Full Bladder



Advantages

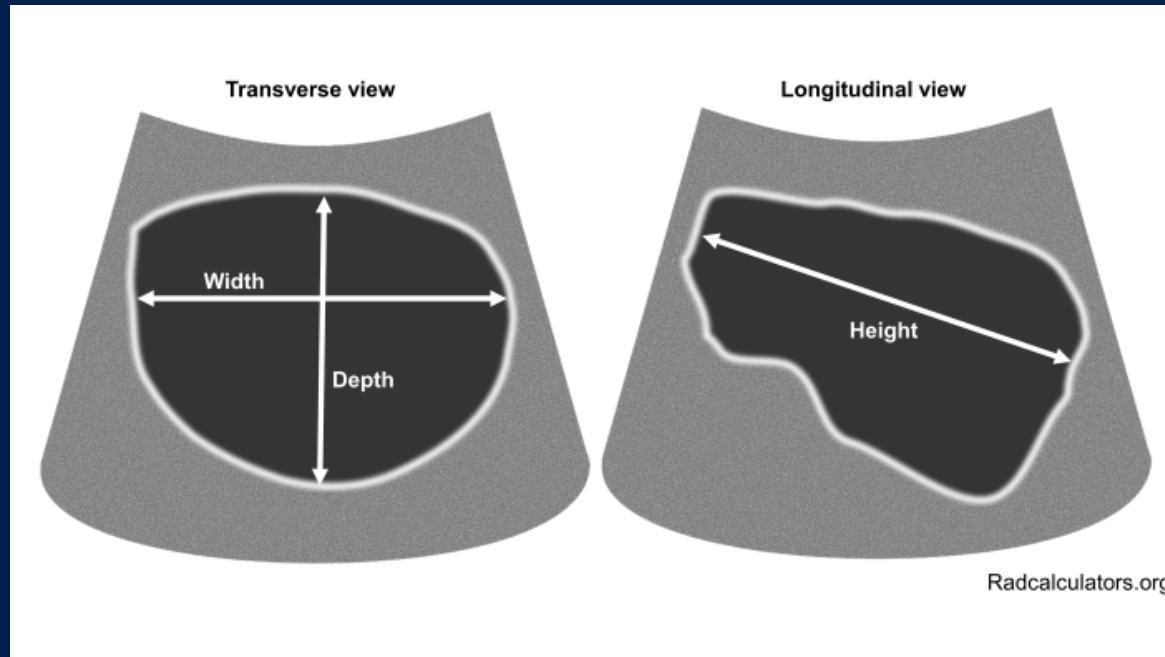
- ◆ Direct visualization
 - ◆ See bladder, ascites, foley balloons, etc
- ◆ More accurate than bladder scanner
 - ◆ Obesity, abdominal fluid are confounders



Post Void Residual (PVR)

- ◆ Have patient void and try to empty bladder completely
- ◆ Scan bladder in transverse and longitudinal planes
- ◆ Calculate PVR

$$\text{Volume (ml)} = L_{(\text{cm})} \times W_{(\text{cm})} \times H_{(\text{cm})} \times 0.7$$



PVR/Urinary Retention Pearls

- ◆ Managing Urinary Retention
 - ◆ Consider lowering dose of full/partial agonist
 - ◆ Address constipation (naloxogol, linaclotide)
 - ◆ Other factors – including diet after stabilization of OUD
 - ◆ Benign prostatic hyperplasia

Case #3

42 yo presents to clinic with fever, dyspnea and reports intermittent inhalational use of methamphetamines for several years. Tells you up front they really don't want to go to the hospital/ER.

You order a CXR which takes days for the patient to try to get done.....

Case #3 Con'd

- ◆ What is on your differential (shout out)?
- ◆ Lets say you're most concerned about PNA, what does the literature say about CXR vs. POCUS?

POCUS vs. CXR

Indication	CXR (sensitivity)	POCUS (sensitivity)
Pulmonary Edema	46%	94%
Pleural effusion	65%	100%
PTX	52%	88%
Pneumonia	54%	95%

<https://pubmed.ncbi.nlm.nih.gov/29527652/>

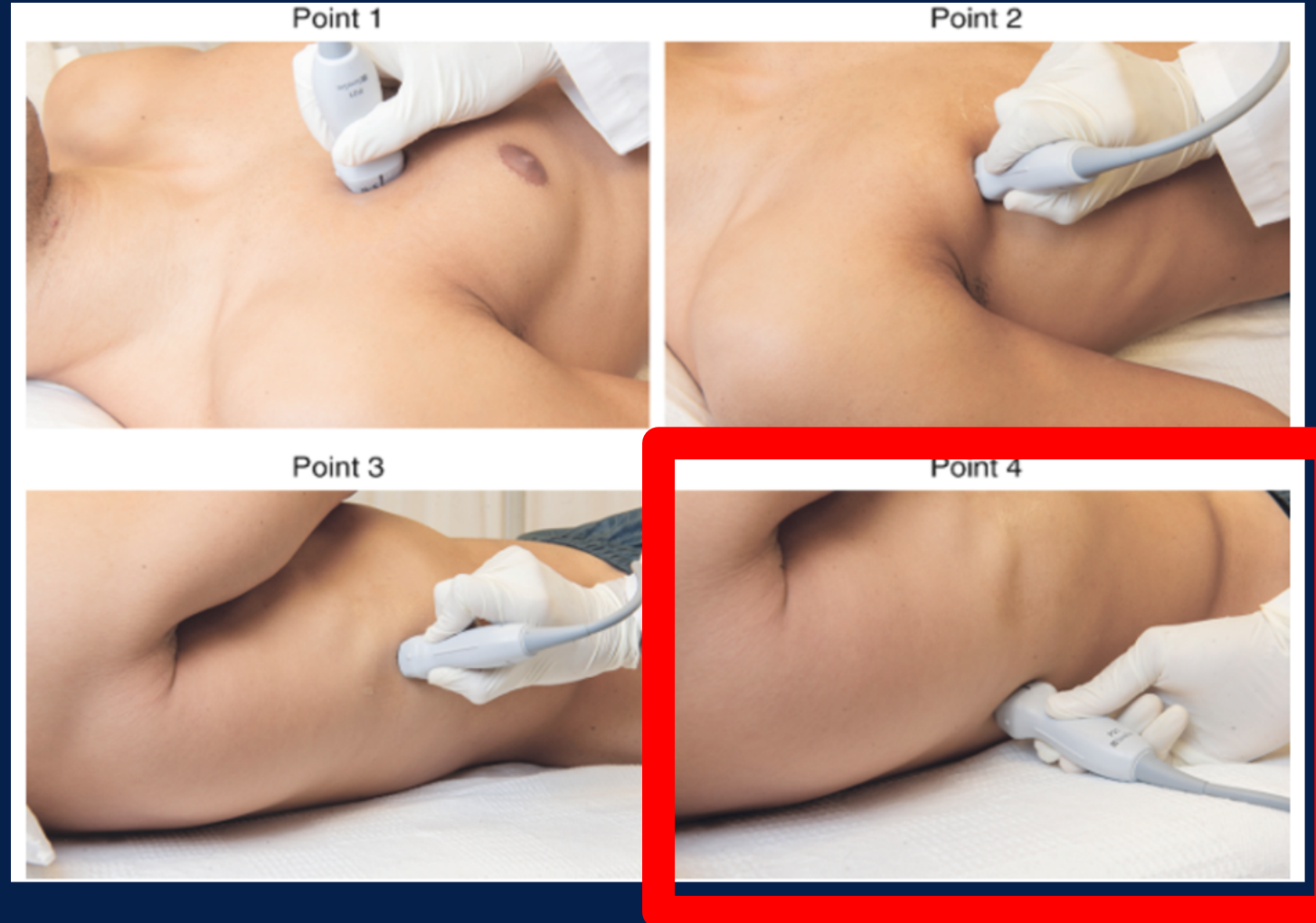
<https://pubmed.ncbi.nlm.nih.gov/26862542/>

<https://pubmed.ncbi.nlm.nih.gov/32702777/>

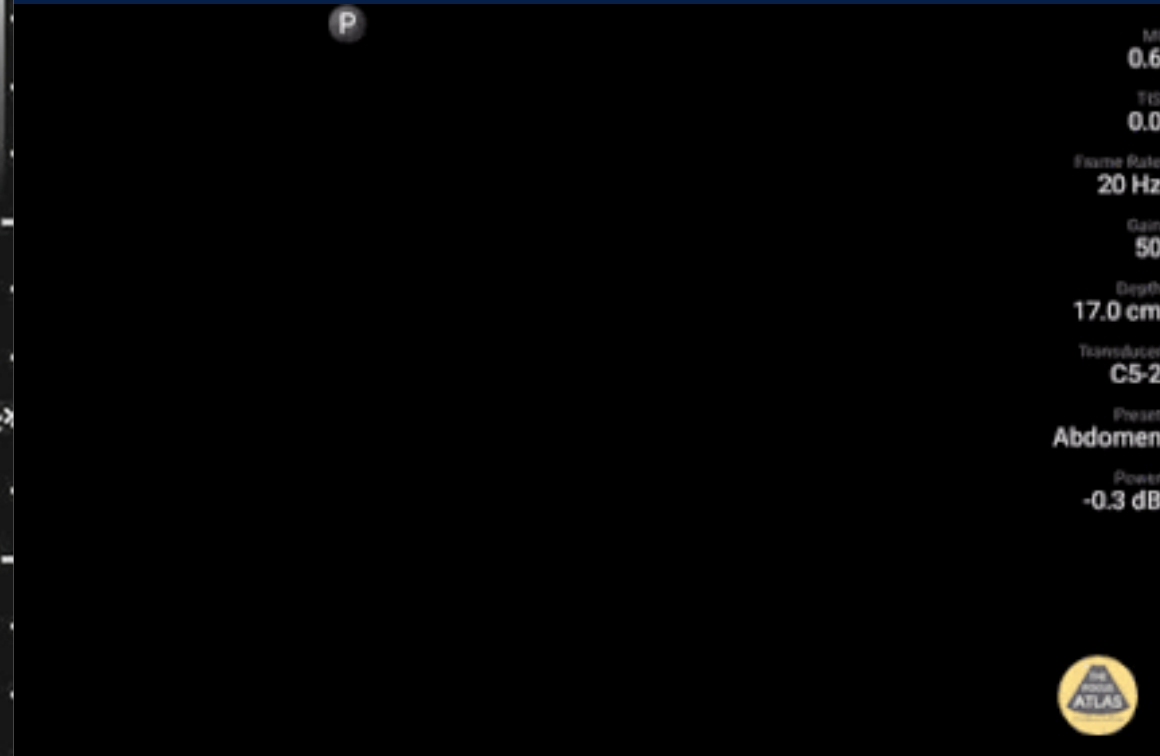
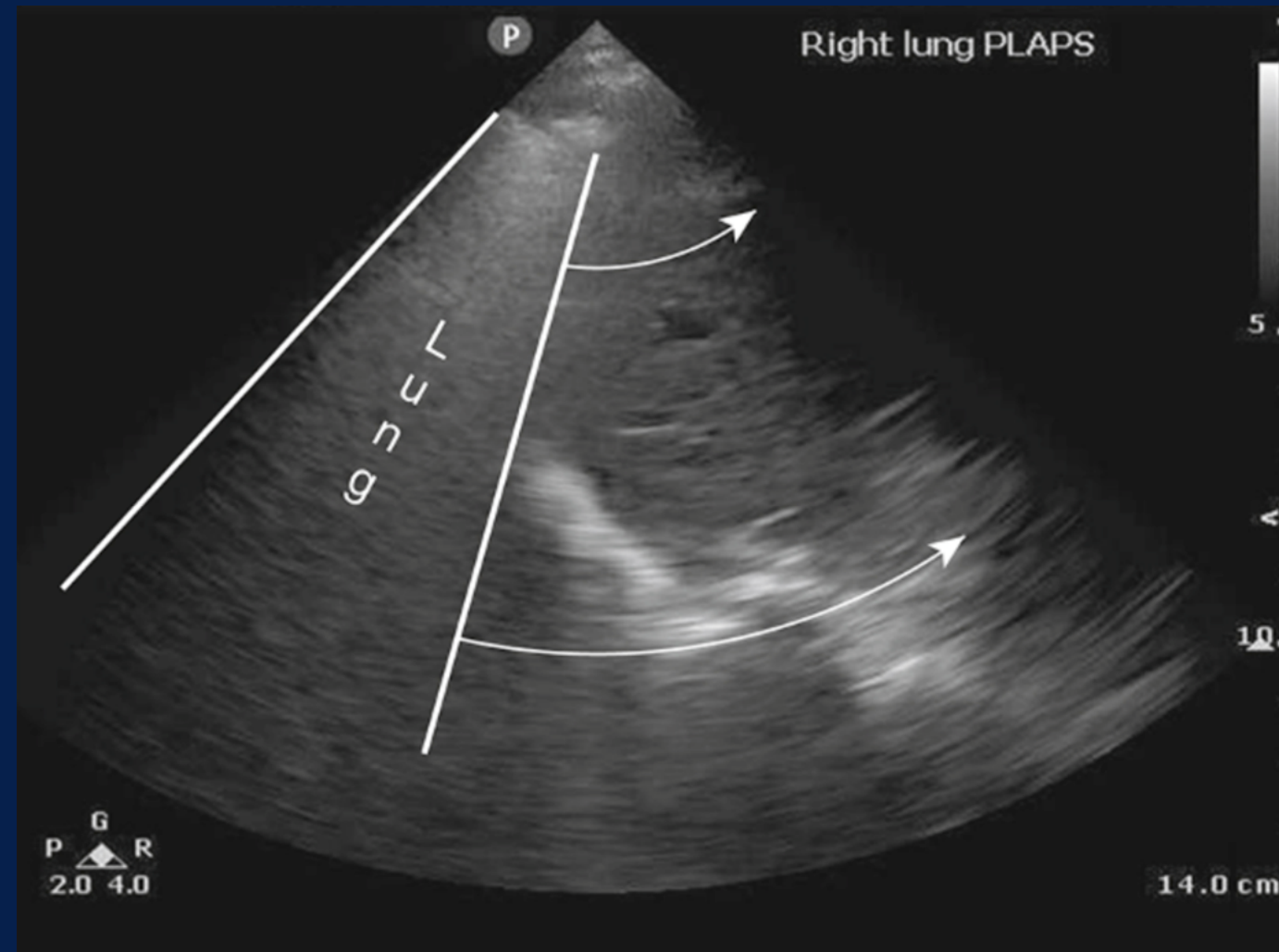
<https://pubmed.ncbi.nlm.nih.gov/30604779/>

Focus on Diaphragm View

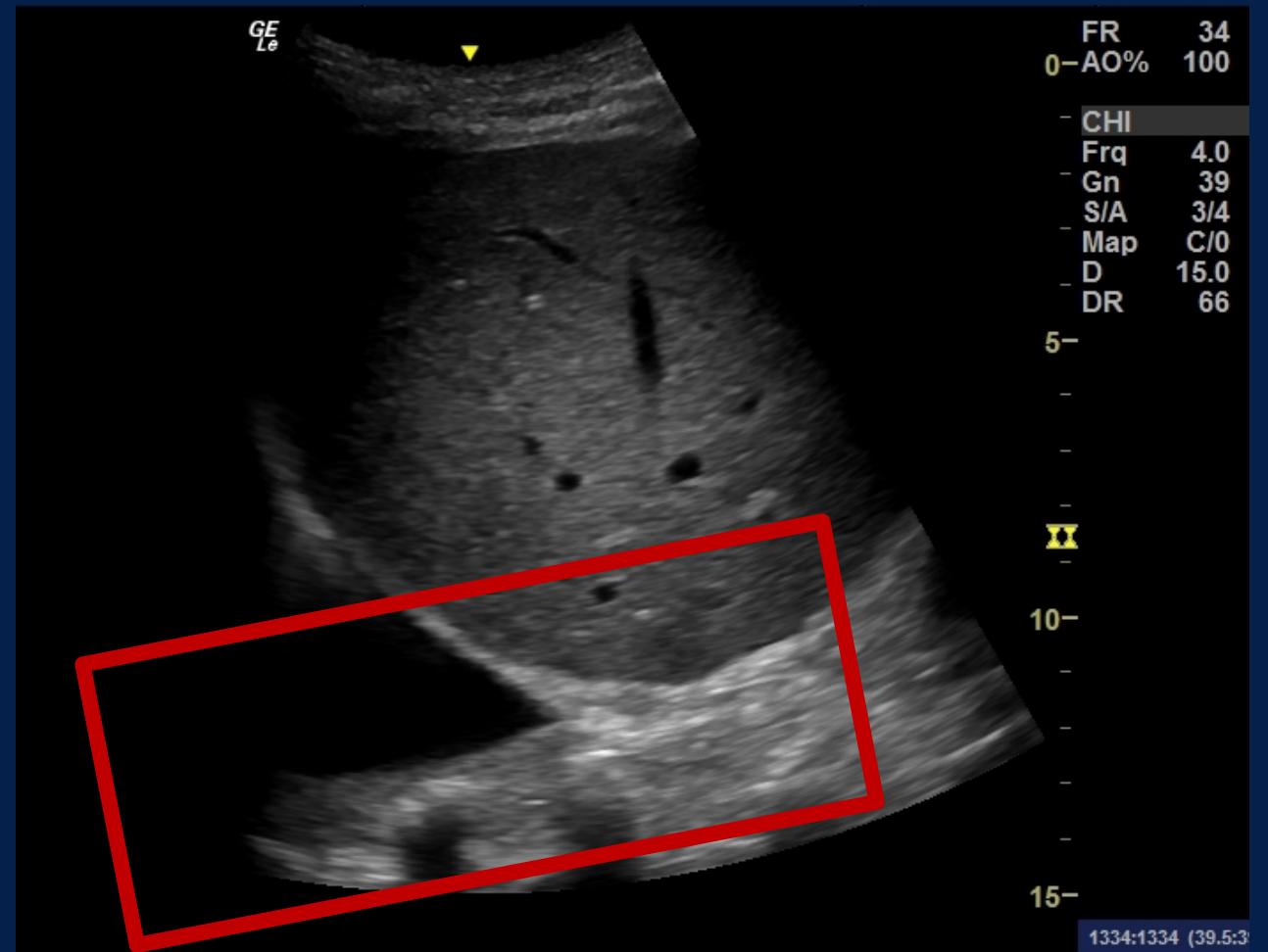
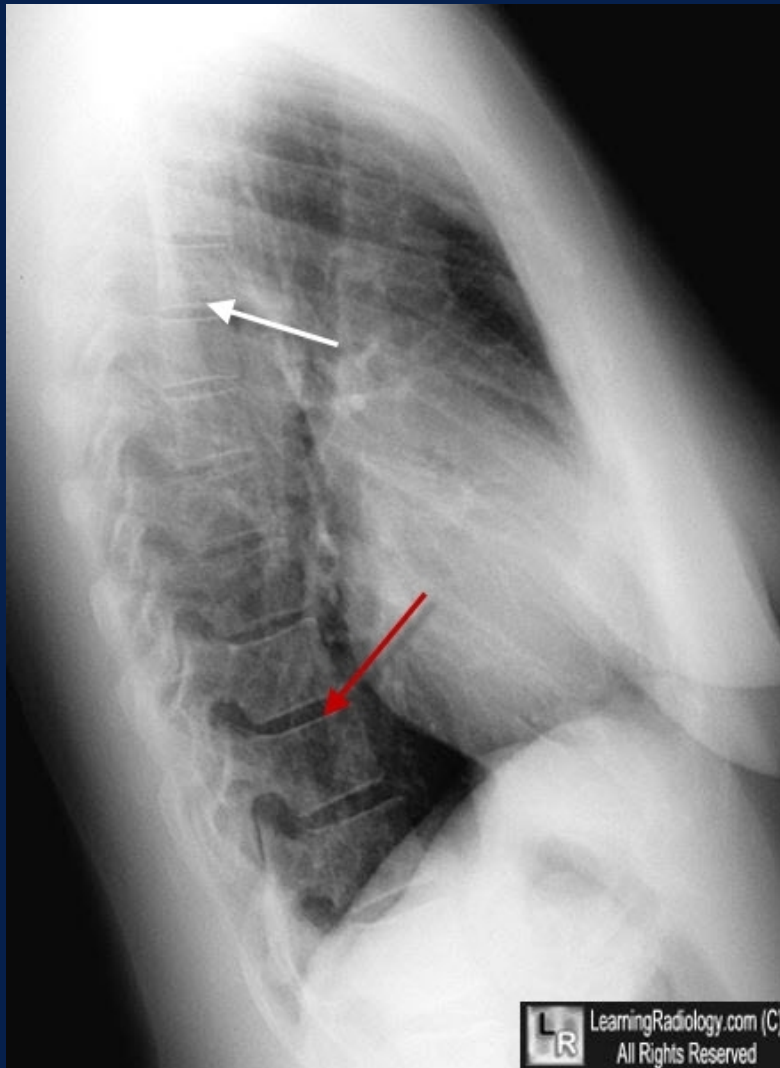
- ◆ Is there effusion or consolidation?



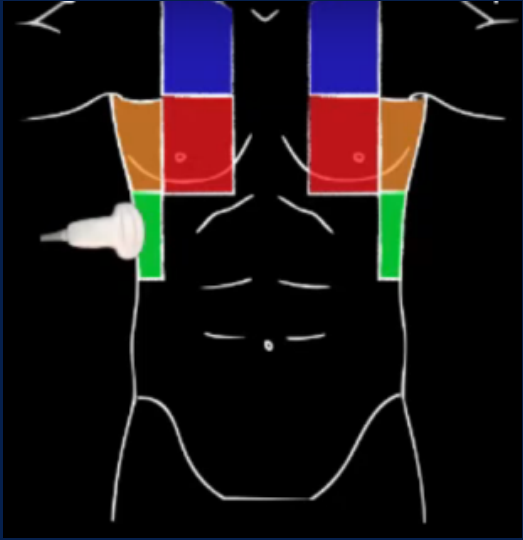
Normal: Curtain Sign



Spine Sign



Simple Pleural effusion



Pneumonia

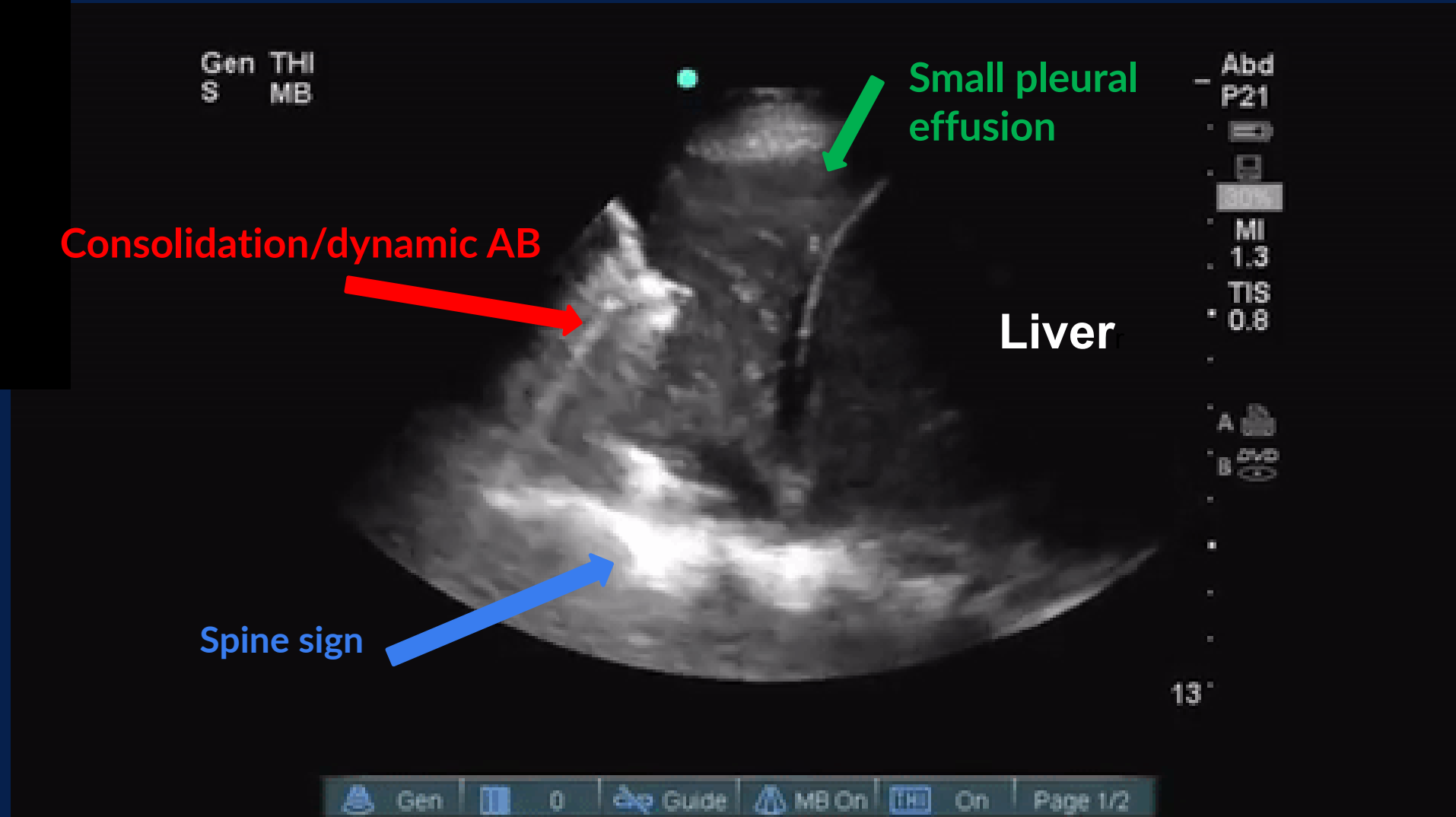


Consolidation/dynamic AB

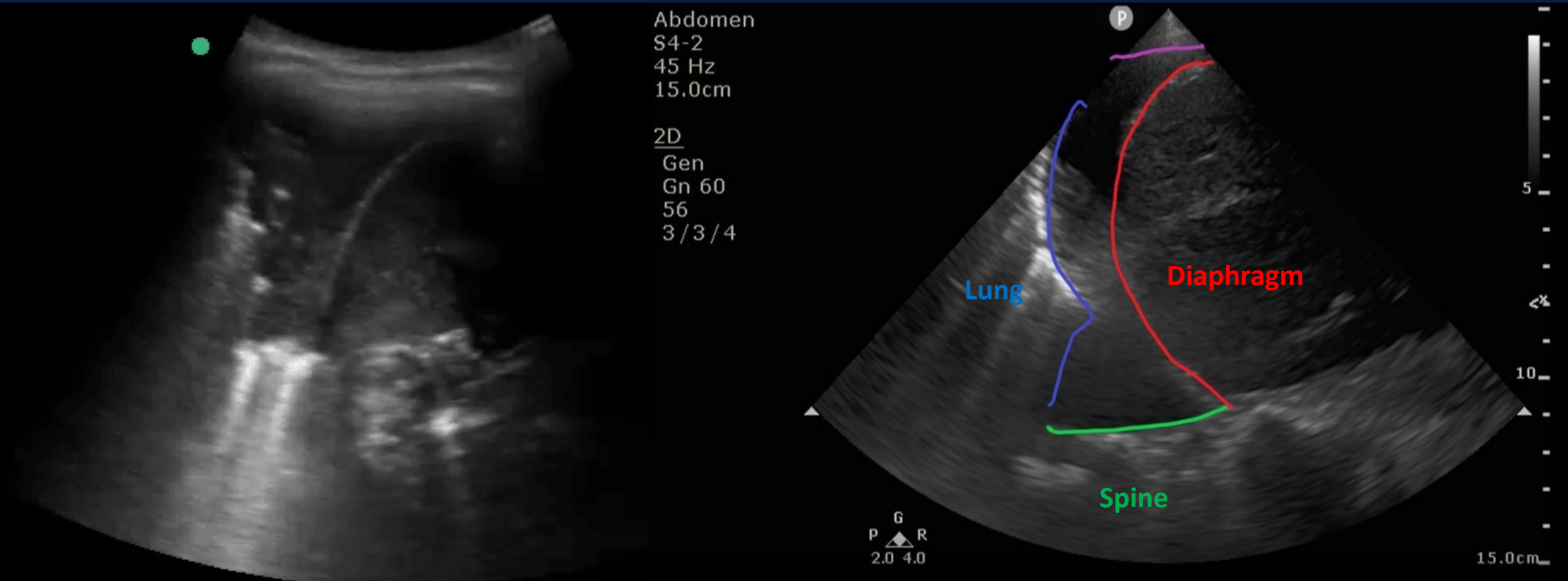
Small pleural effusion

Liver

Spine sign



Pneumonia



Reflections

What's a case you wish you could re-do now,
that may have been impacted by POCUS?



Where to Get More Info?

- ◆ Online Resources
- ◆ Books
- ◆ Conferences
- ◆ Ask for more POCUS at ASAM!
 - ◆ Preconference workshop for hands on skills?



Final Takeaways

- ◆ Could we have AM fellowships implement POCUS as a core competency to aid in decision making?
 - ◆ Assemble core skills in a POCUS working group
 - ◆ [Addiction Medicine Milestones](#)
 - ◆ What modalities would be most important regardless of specialty
- ◆ POCUS is a helpful tool for the addiction medicine clinician in outpatient/inpatient settings and can improve care for patients.

References

- ◆ Ben-Baruch Golan Y, et al. Early Point-of-Care Ultrasound Assessment for Medical Patients Reduces Time to Appropriate Treatment: A Pilot Randomized Controlled Trial. *Ultrasound Med Biol*. 2020;46(8):1908-1915. doi:10.1016/j.ultrasmedbio.2020.03.023
- ◆ Chan H. Noninvasive bladder volume measurement. *J Neurosci Nurs*. 1993;25(5):309-312. doi:10.1097/01376517-199310000-00007
- ◆ Subramaniam S, Bober J, Chao J, Zehtabchi S. Point-of-care Ultrasound for Diagnosis of Abscess in Skin and Soft Tissue Infections. *Acad Emerg Med*. 2016 Nov;23(11):1298-1306.
- ◆ Howard ZD, et al. Bedside ultrasound maximizes patient satisfaction. *J Emerg Med*. 2014;46(1):46-53. doi:10.1016/j.jemermed.2013.05.044
- ◆ Laursen, C. B., Sloth, E., Lambrechtsen, J., Lassen, A. T., Madsen, P. H., Henriksen, D. P., Davidsen, J. R., & Rasmussen, F. (2013). Diagnostic performance of chest X-ray for the diagnosis of community acquired pneumonia in acute admitted patients with respiratory symptoms. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine*, 21(Suppl 2), A21.

POCUS for Addiction Medicine

Thank you!

Michael Baca-Atlas, MD, FASAM
michaelhatlas@gmail.com

Tom Robertson, MD
thomasedwardrobertson@gmail.com

