

# MSK US Procedures:

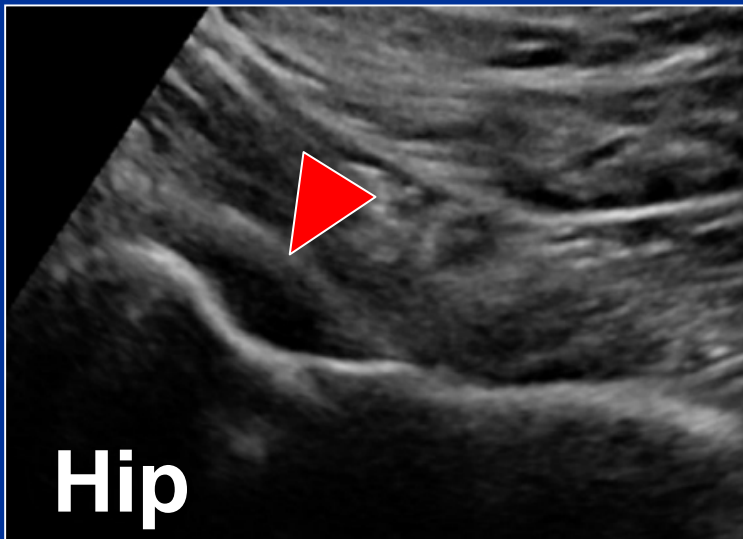
## Principles and Techniques



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University of Wisconsin School of Medicine  
Division of Musculoskeletal Radiology

 @kenlee8799



Hip

# Disclosures

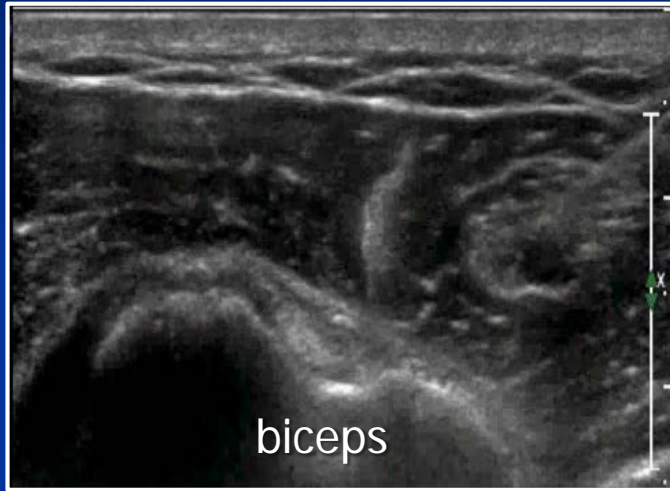
- Grants: NBA/GE, Mitek
- Research: SuperSonic Imagine
- Royalties: Elsevier

# Objectives

- To learn the indications of an US-guided procedure
- To become familiar with how to perform an ultrasound-guided joint aspiration/injection
  - Hip
  - Knee
  - Shoulder

# Common USGI

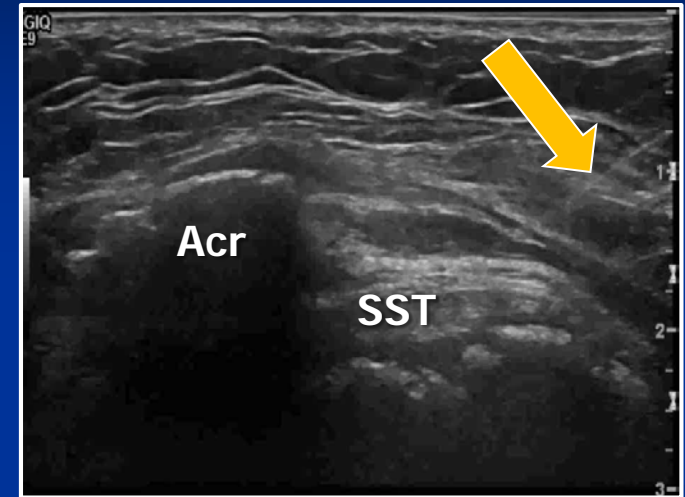
## ➤ Tendon sheaths



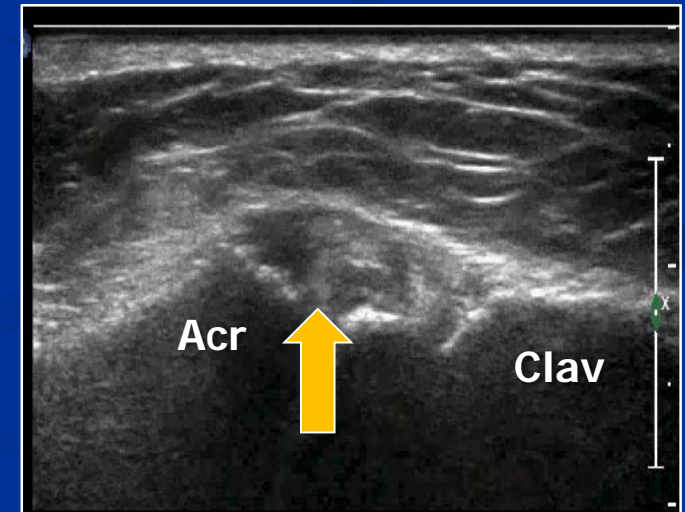
## ➤ Aspiration



## ➤ Bursa



## ➤ Joints



# Advantages of US

- No ionizing radiation
- Real time imaging
  - Anatomic Detail
  - Target Localization
  - Needle Tip Position
- Relatively Inexpensive

# Basic Principles

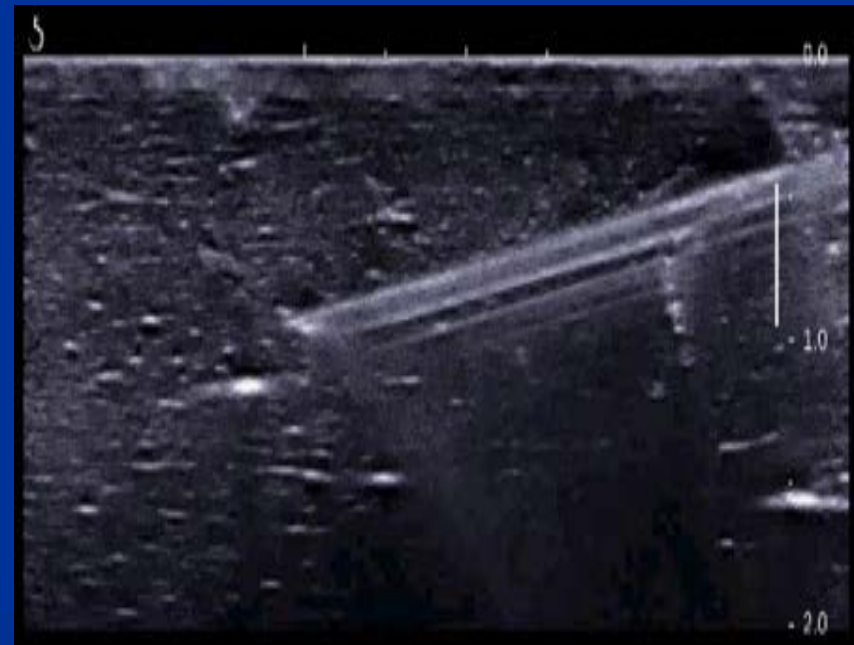
- Understand the anatomy
- Understand US Physics ☹️
- Understand importance of positioning

# Principles: Safety

- Safety first
  - Sterile technique
  - Needle visualization
  - Needle tip
- Accreditation

[www.acr.org](http://www.acr.org)

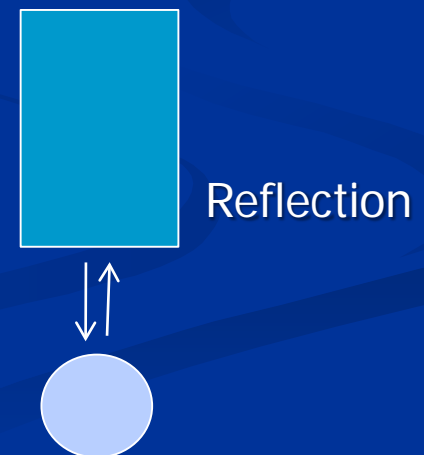
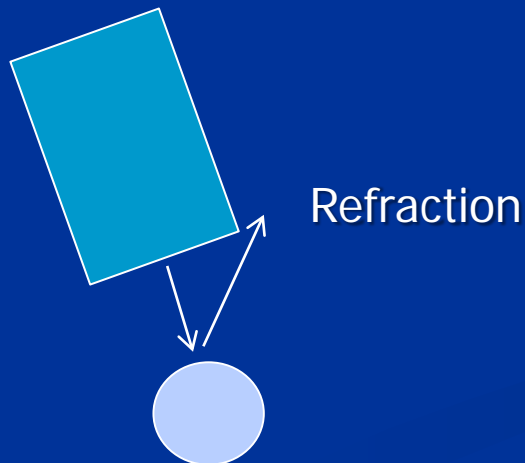
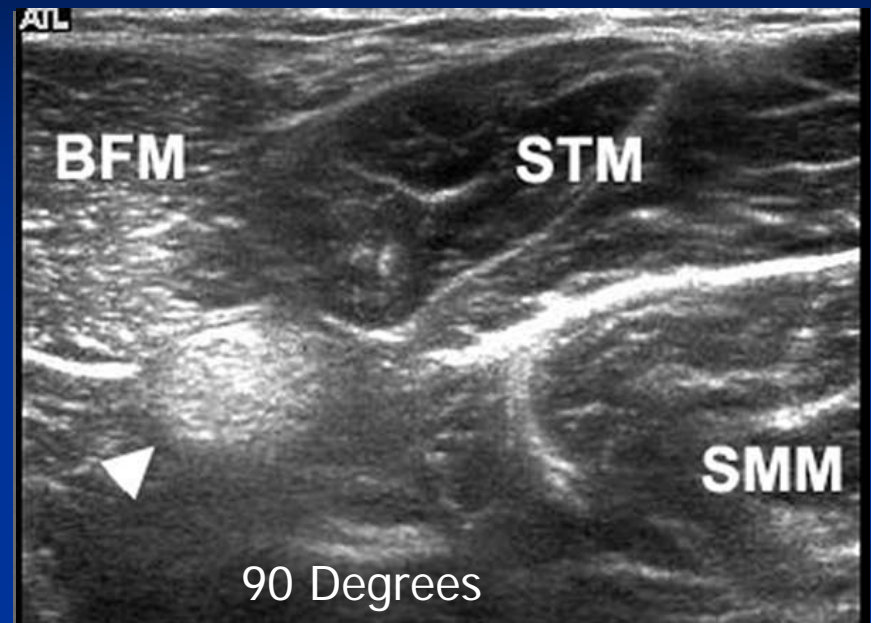
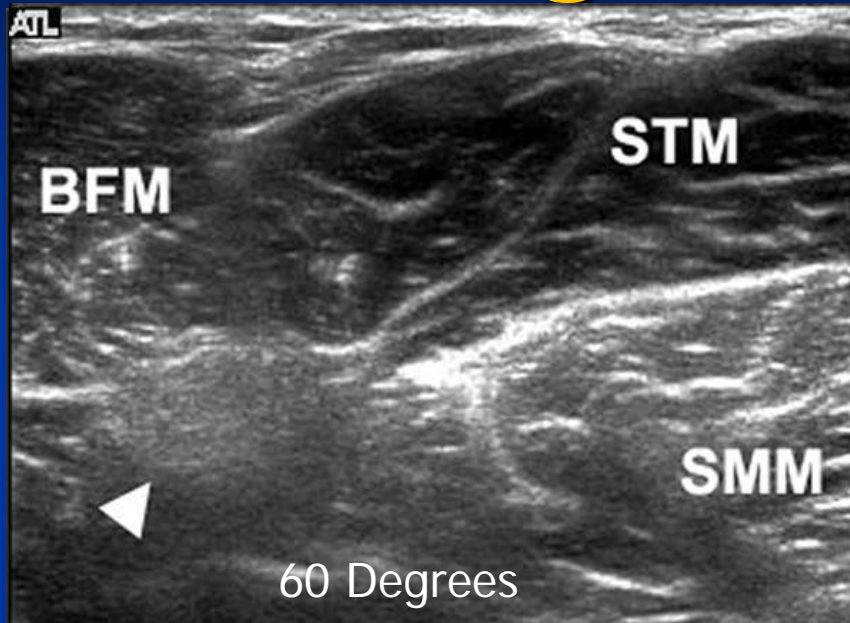
In-plane to Out-of-plane



# Artifacts & Pitfalls

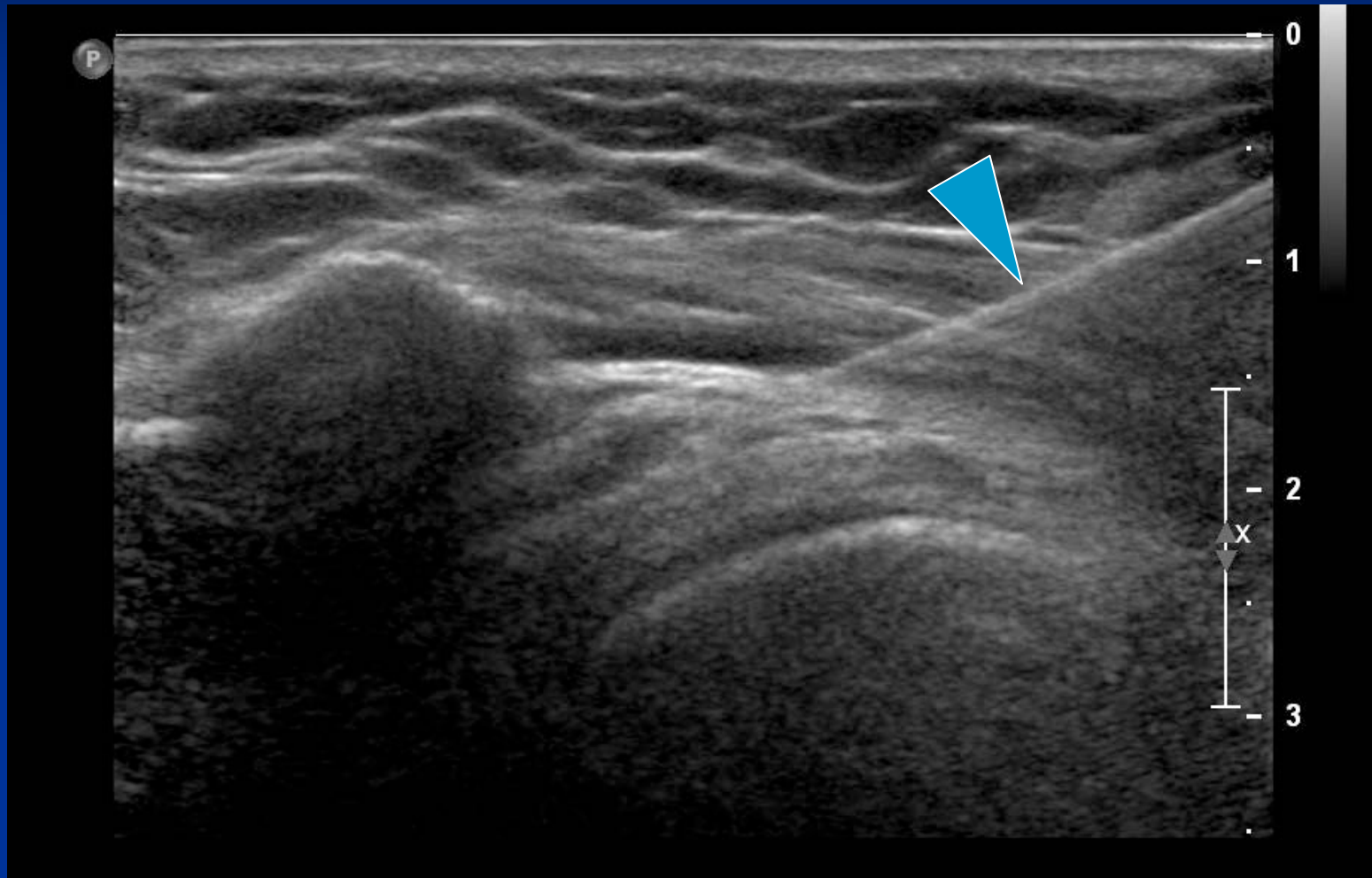


# Angle of Incidence



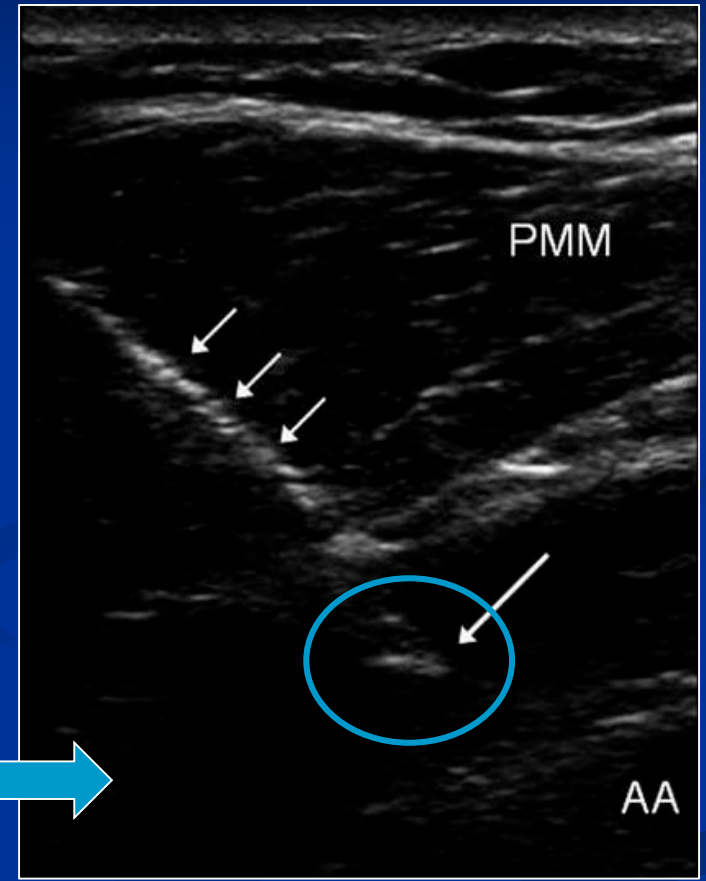
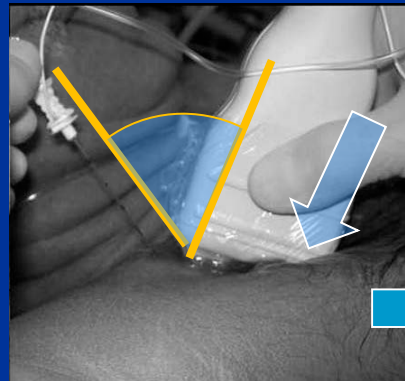
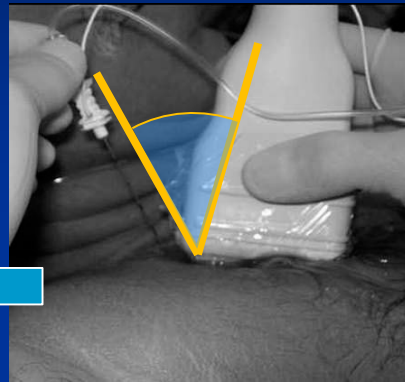
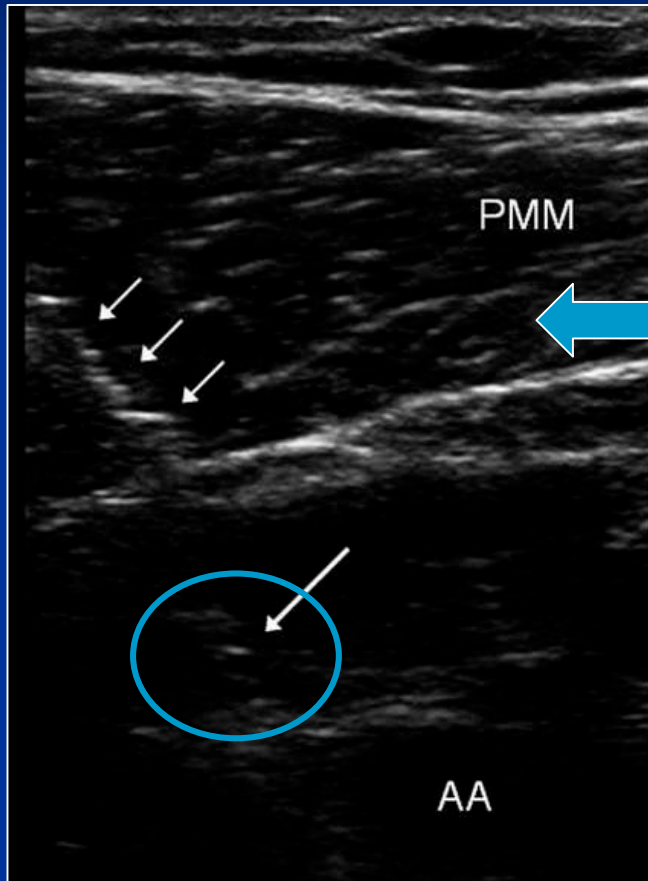
# Needle Visualization

# In-Plane Needle Approach

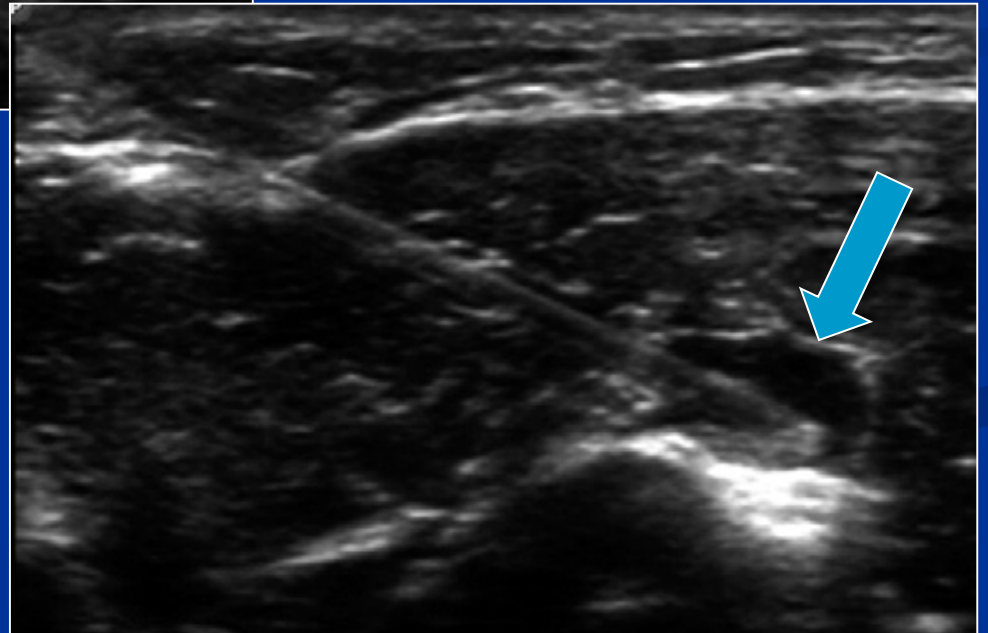
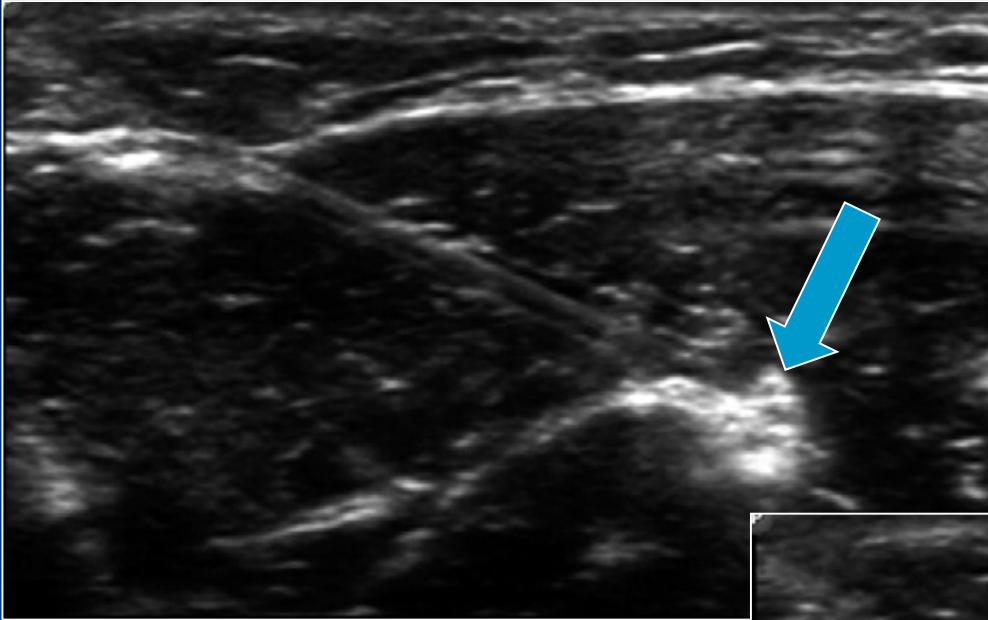


# Needle Manipulation

# “Heel-Toe” Maneuver



# Hydrodissection



# Guides??

## ■ Mechanical Guides

- ↓ Procedure Time
- ↓ Diagnostic Accuracy

## ■ Optical Guides

- No studies to date

# Summary

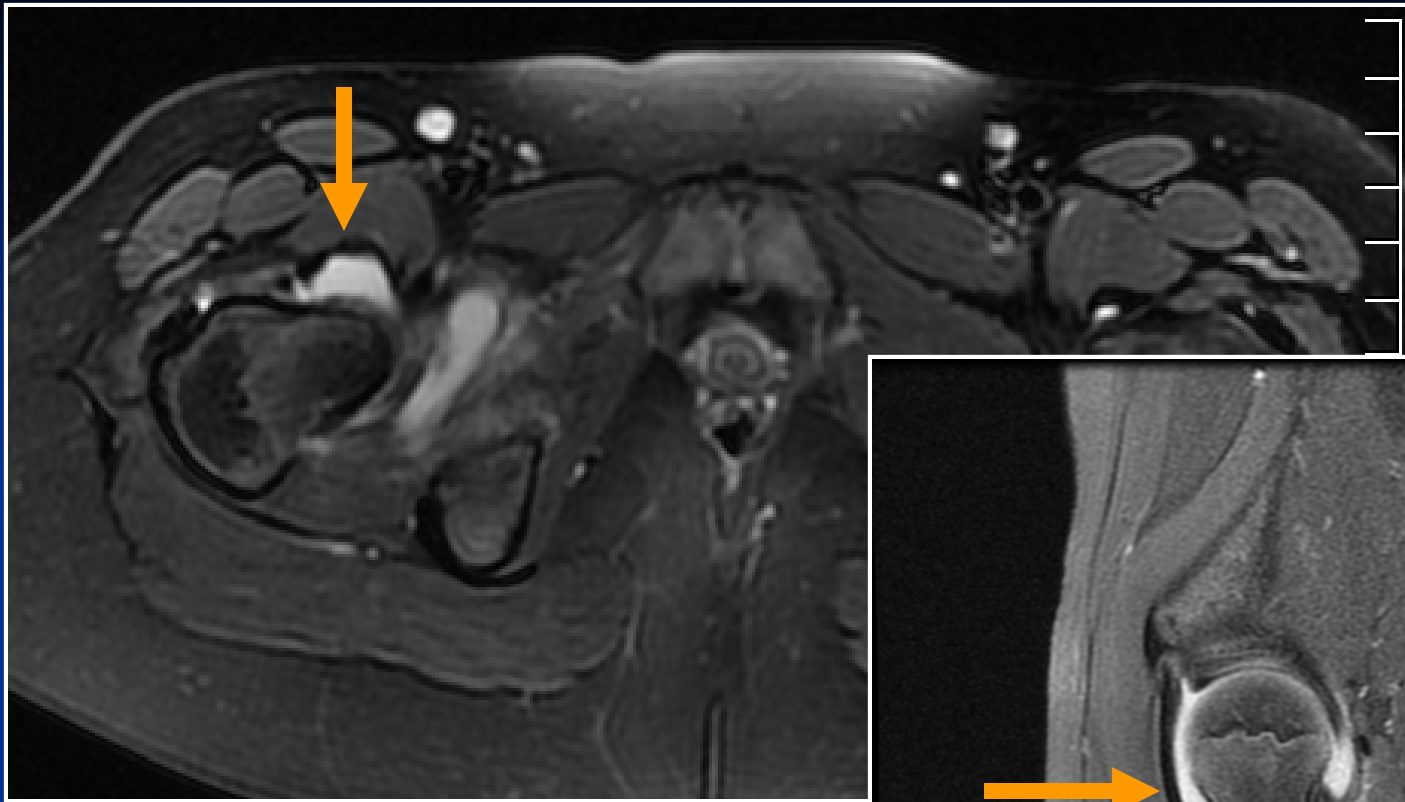
- Know your anatomy
- Positioning
- Beam-Needle Angle
- Hydrodissection
- **Safety is key!**



# Joint Aspiration/Injection

- Hip
- Knee
- Shoulder

**8 year old male with limp.  
History of fever and  
“cold” 2 weeks ago**

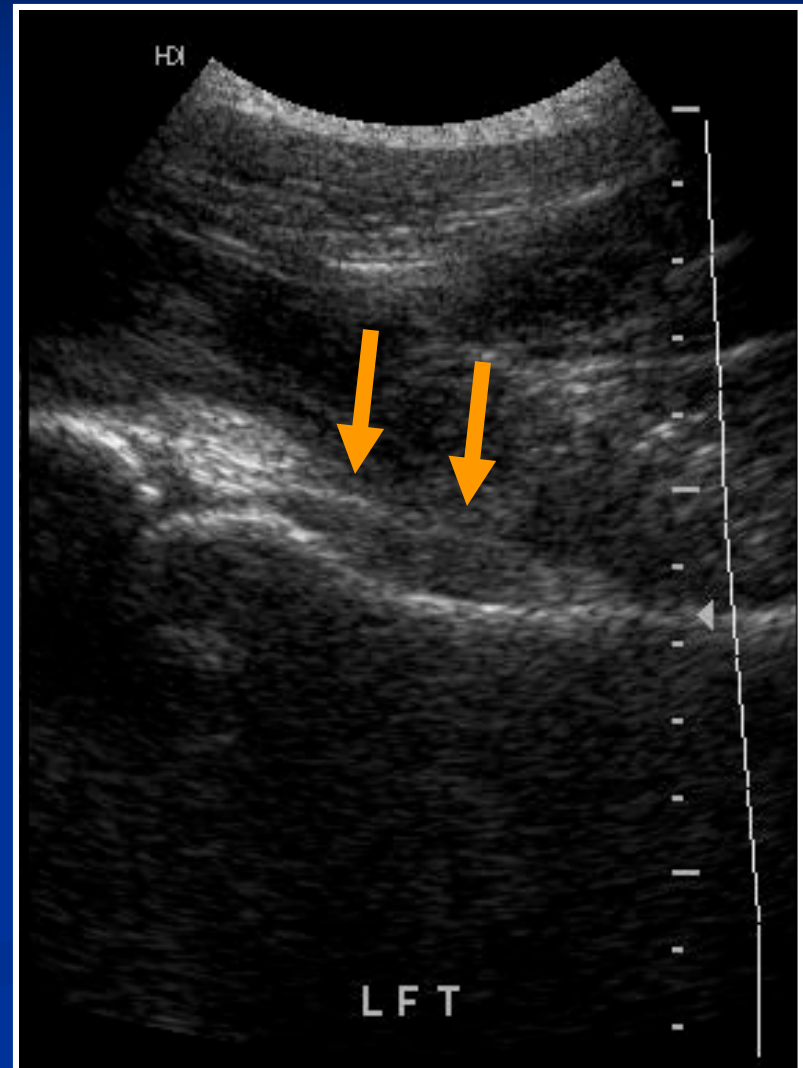
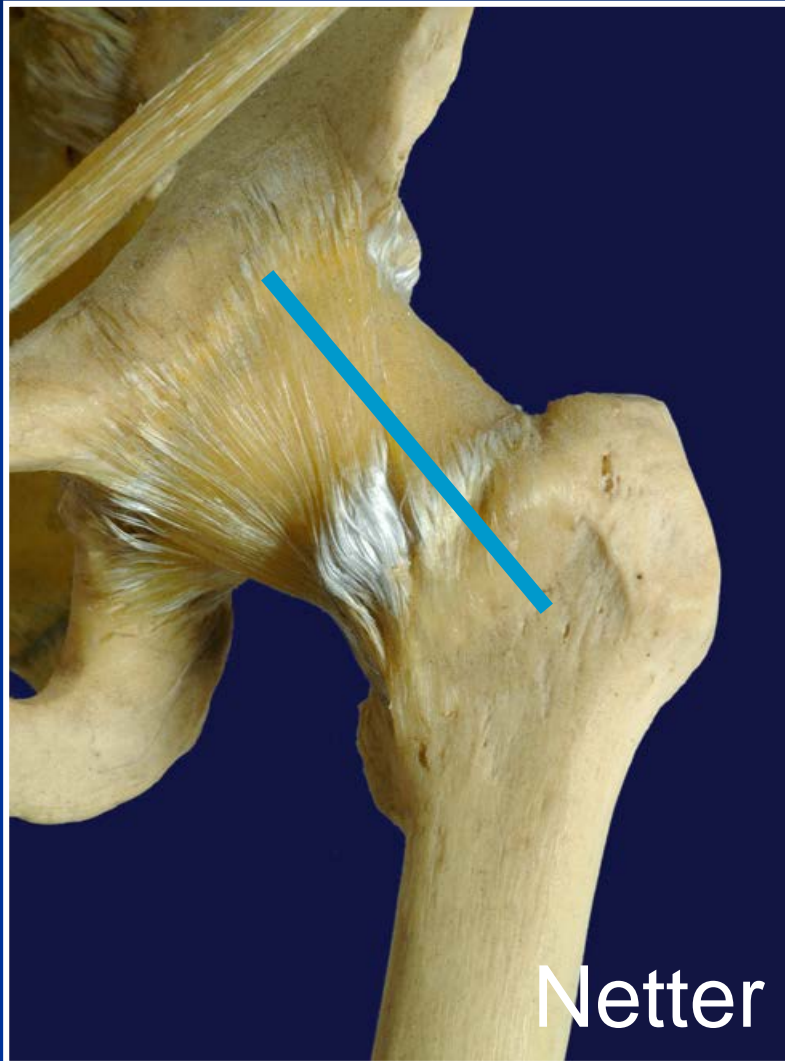


**Axial T2**

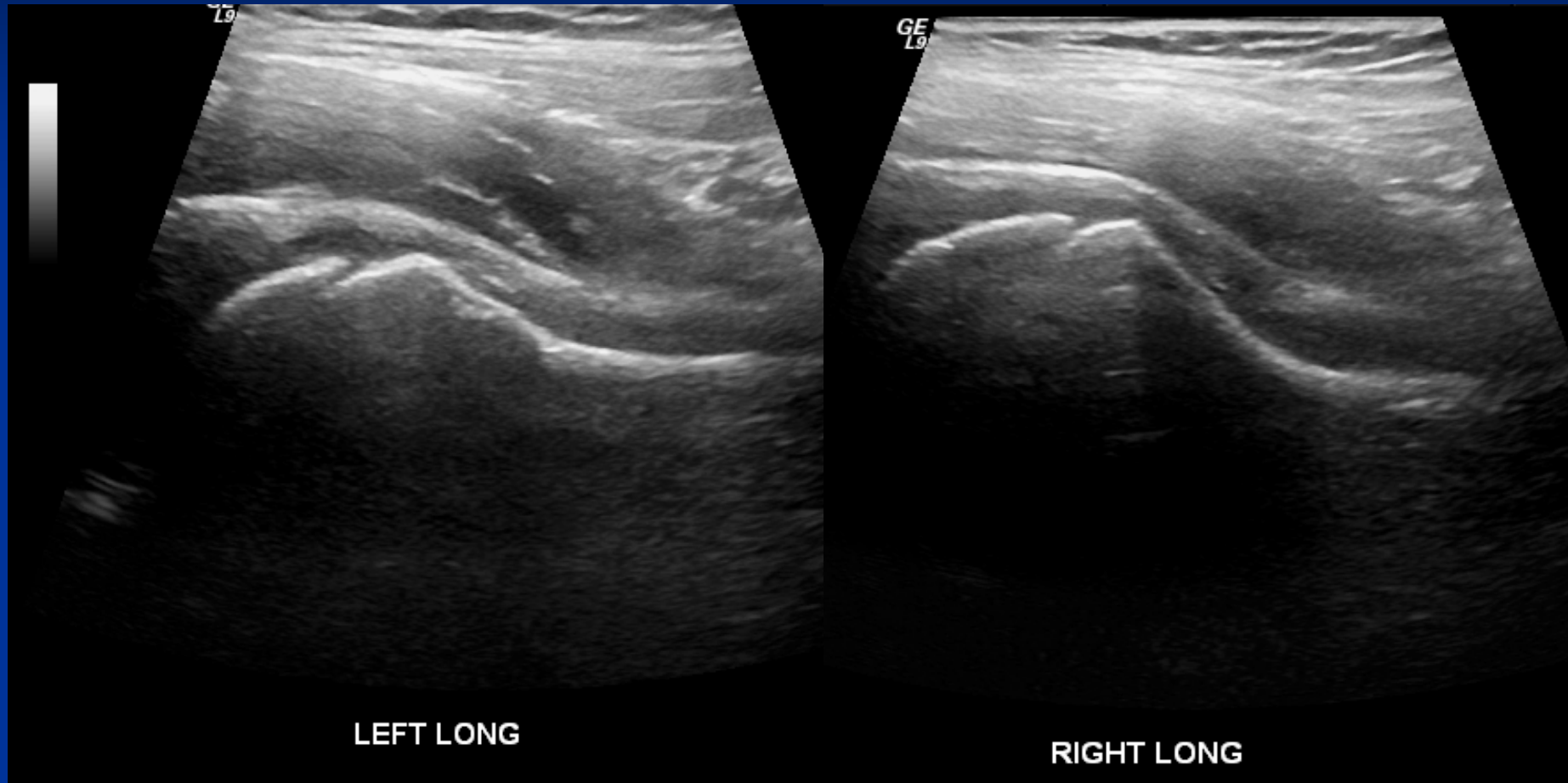


**Sagittal T2-Fat Sat**

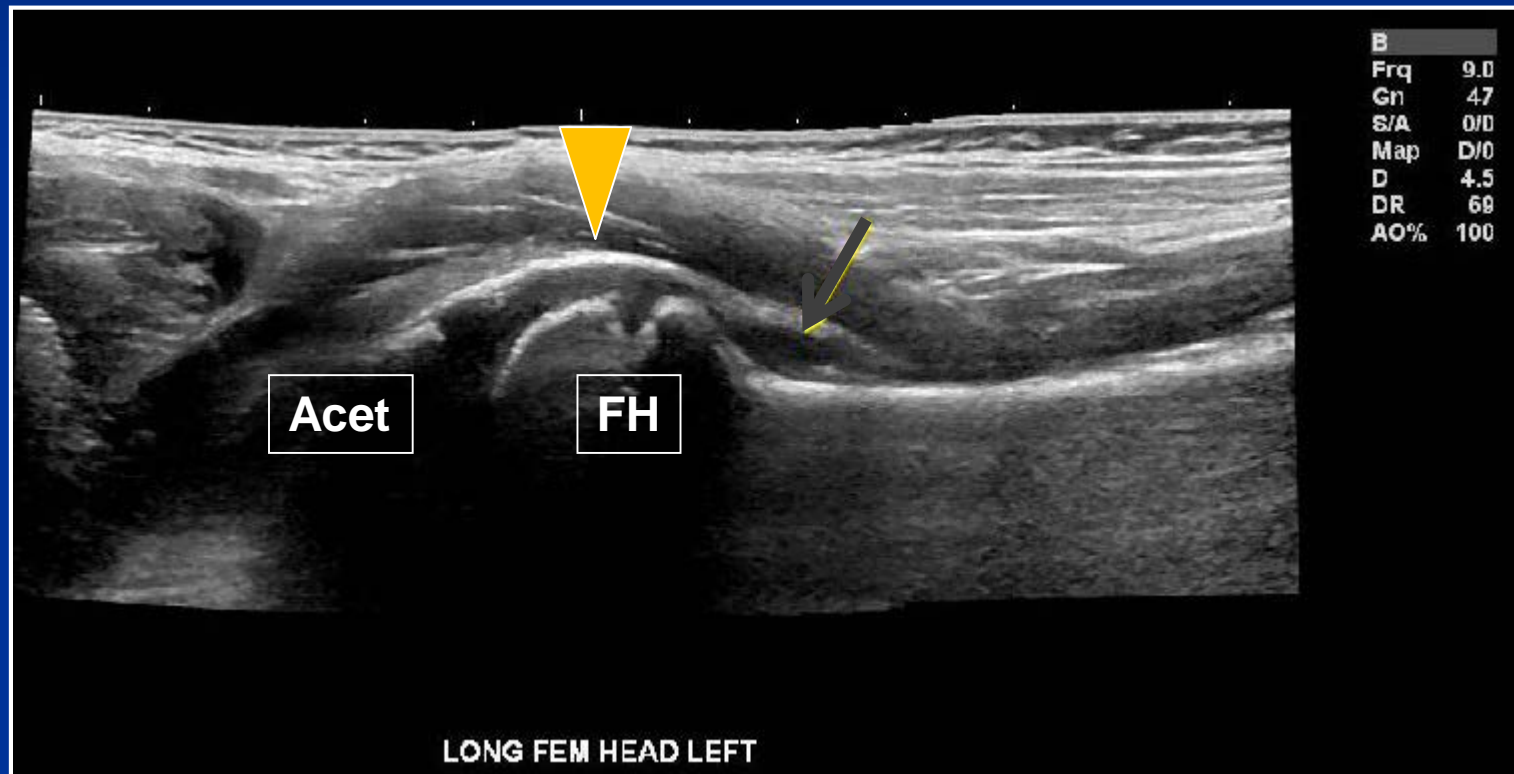
# Normal Hip Ultrasound



# Normal Hip



# Extended Field of View

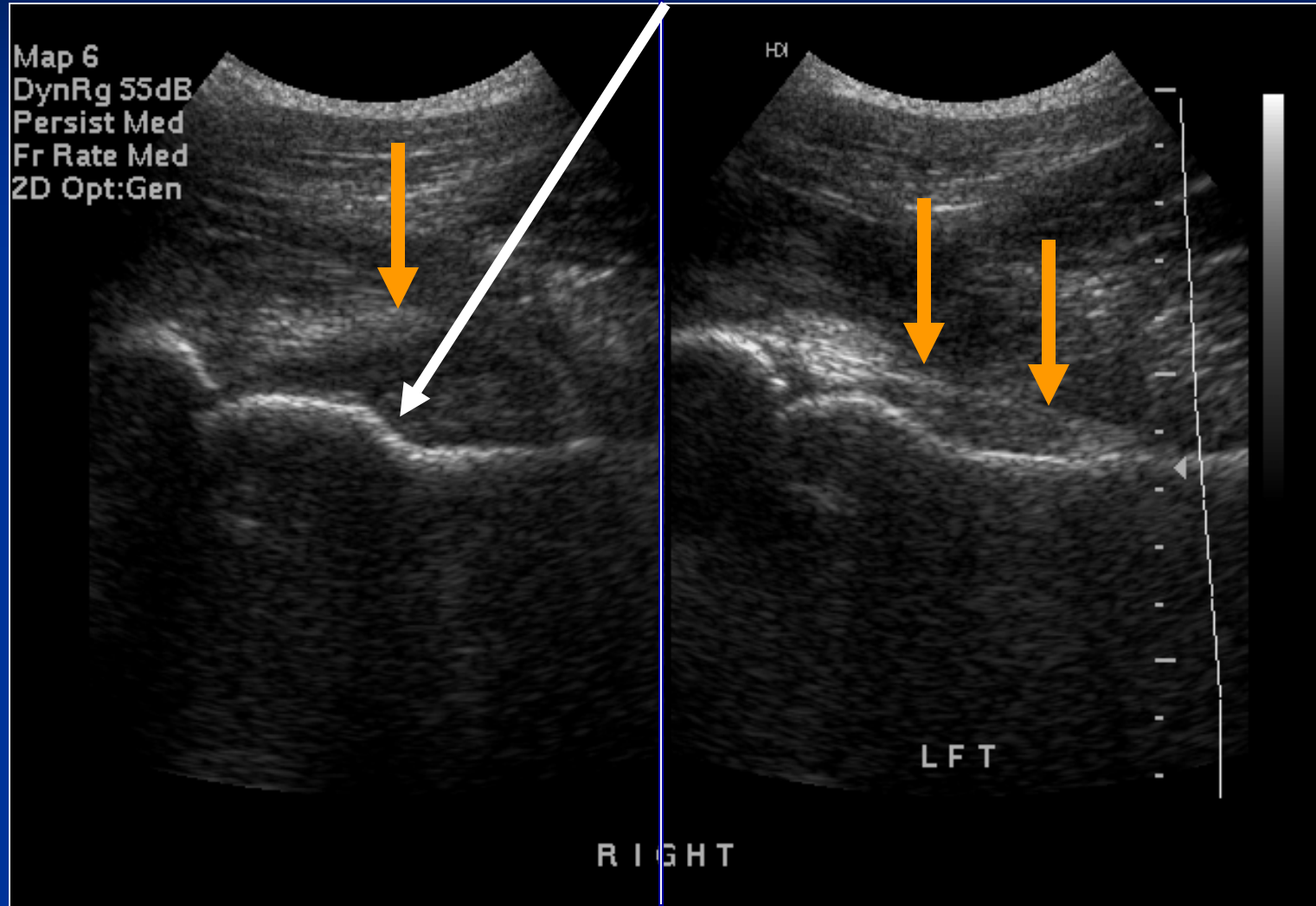


# When in doubt...

- Always compare to contralateral hip
  - Fluid > 5 mm
  - Asymmetry of 2 mm

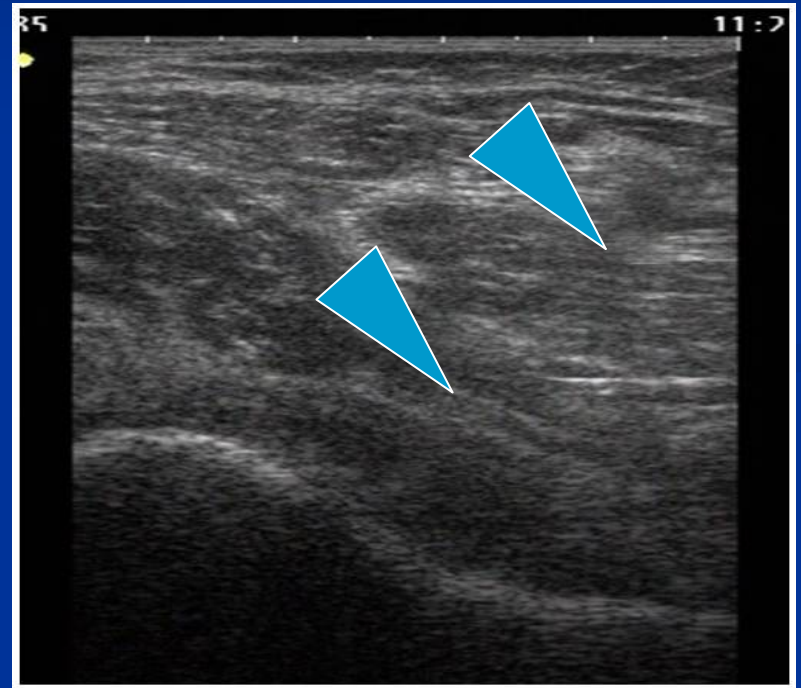


# Hip Effusion



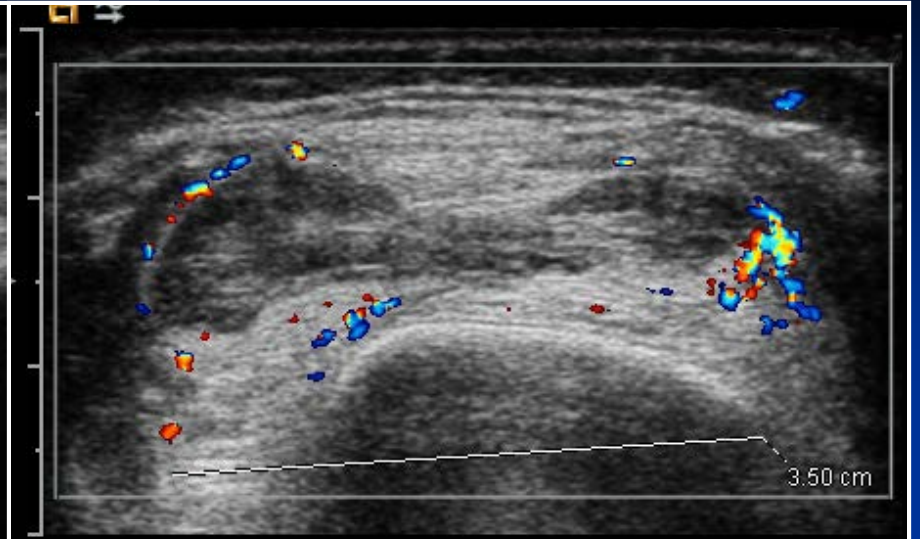
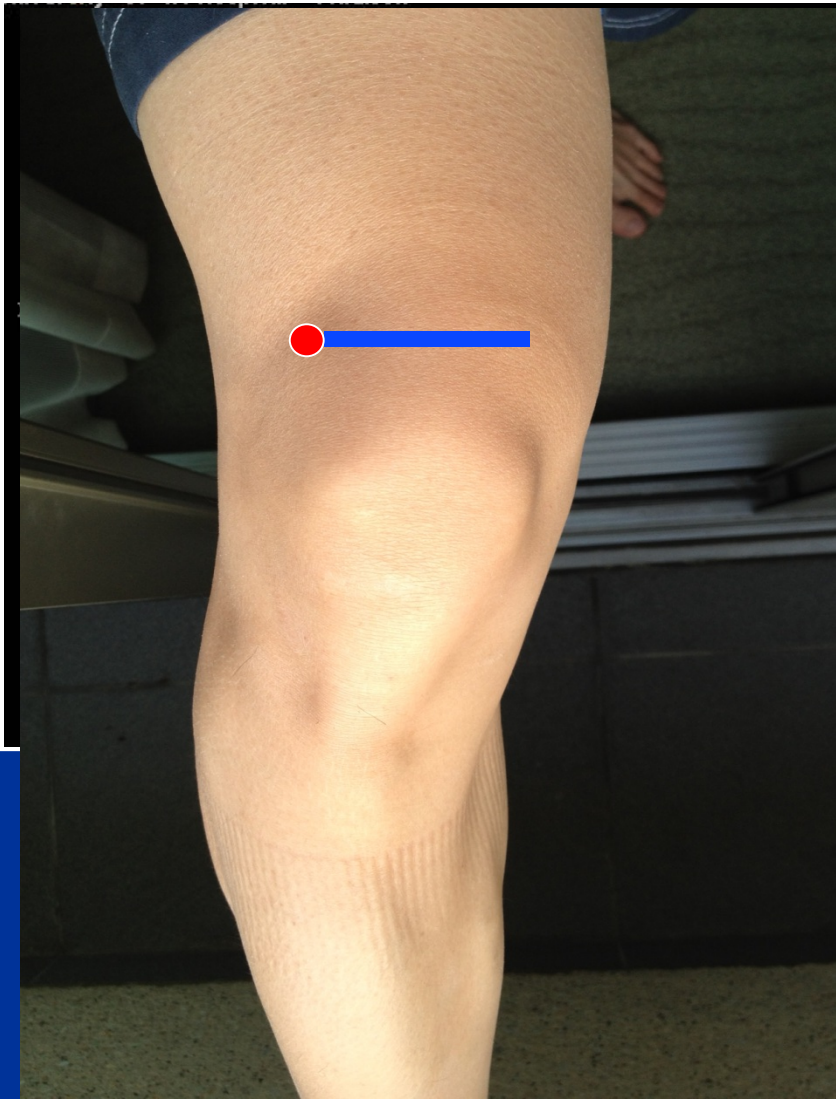


# Hip Effusion

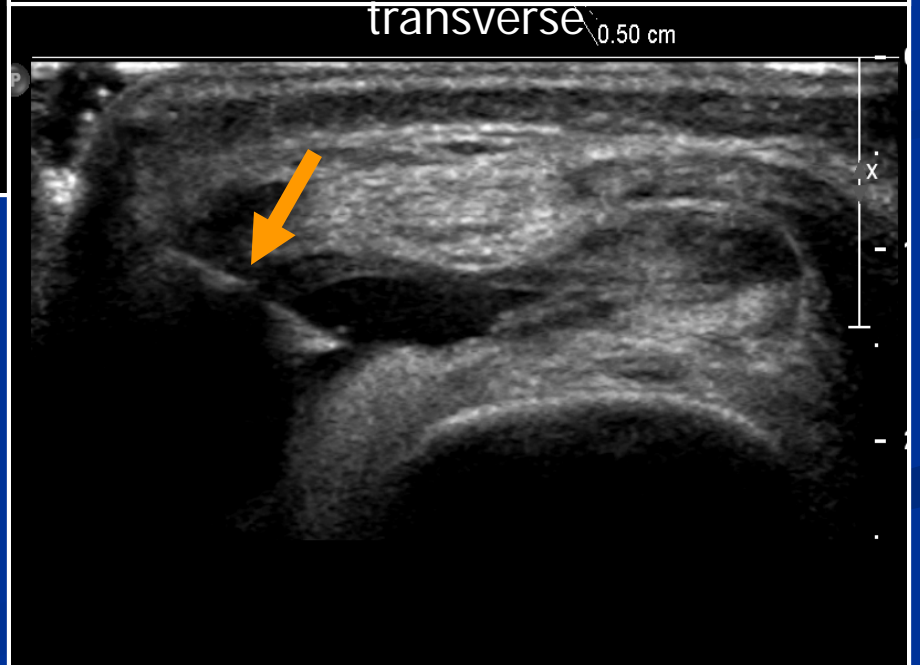


Courtesy of Dr. A. Bouffard

**2 year old female with  
knee swelling, warmth,  
and limp**



transverse 0.50 cm



**13 year old with 2 months  
of shoulder pain and  
progressive loss of ROM**

# MRI of the Shoulder

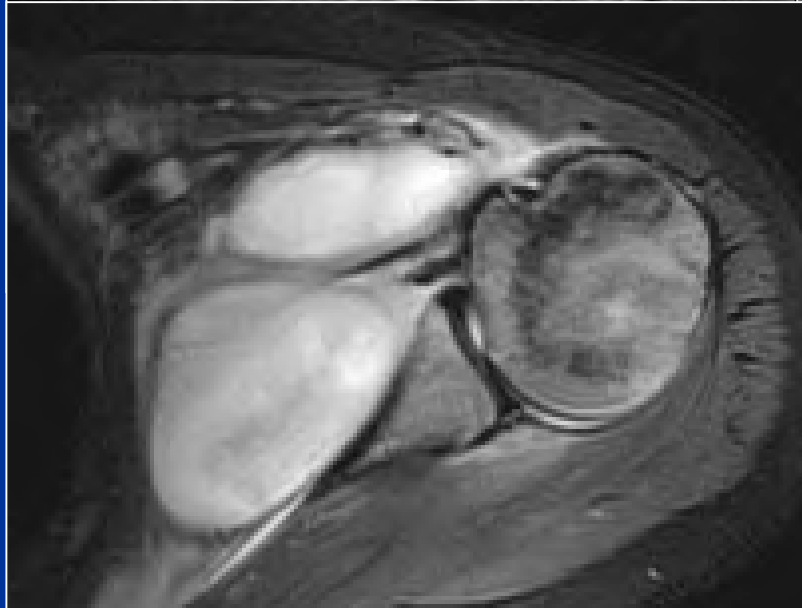
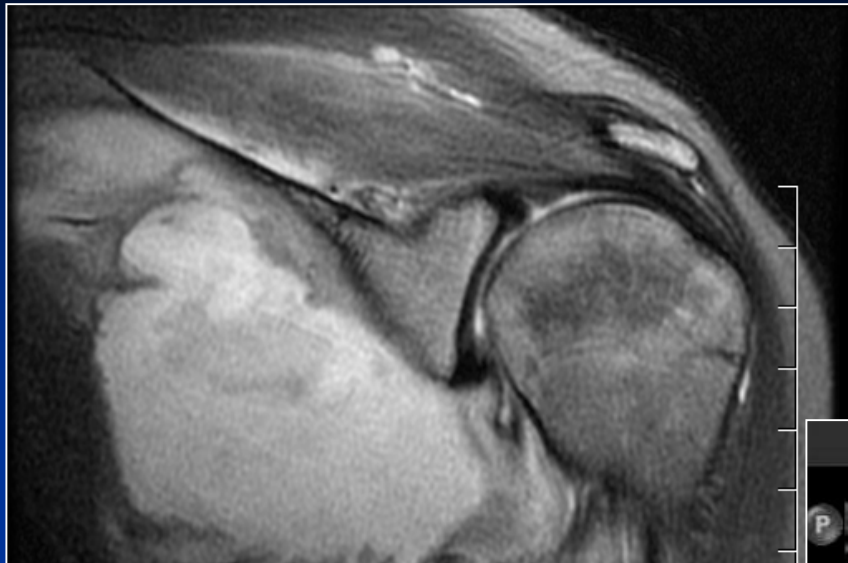


**Coronal T2**

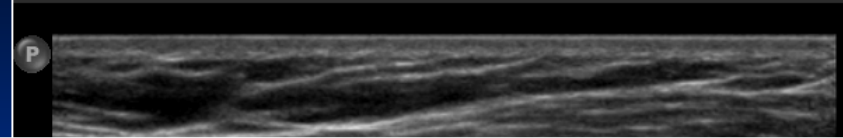


**Sagittal T2**

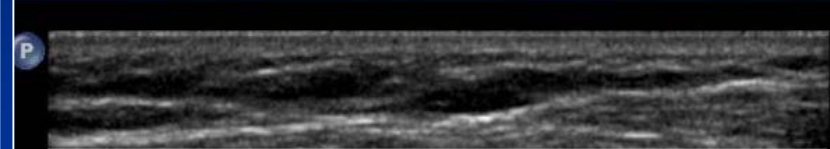




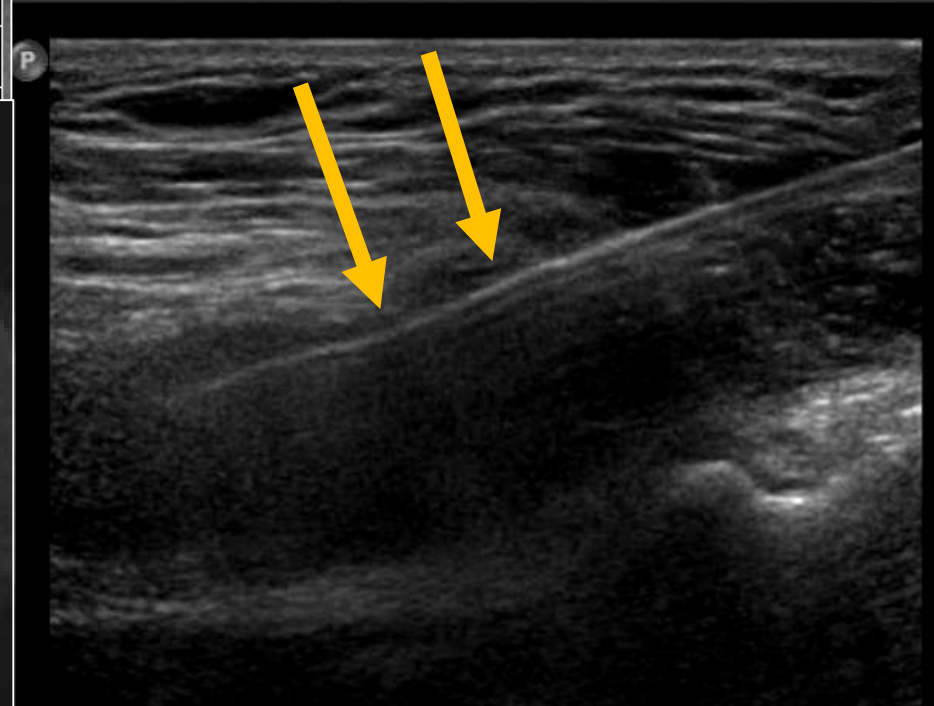
UW Hospital & Clinics L12-5/MSK Gen



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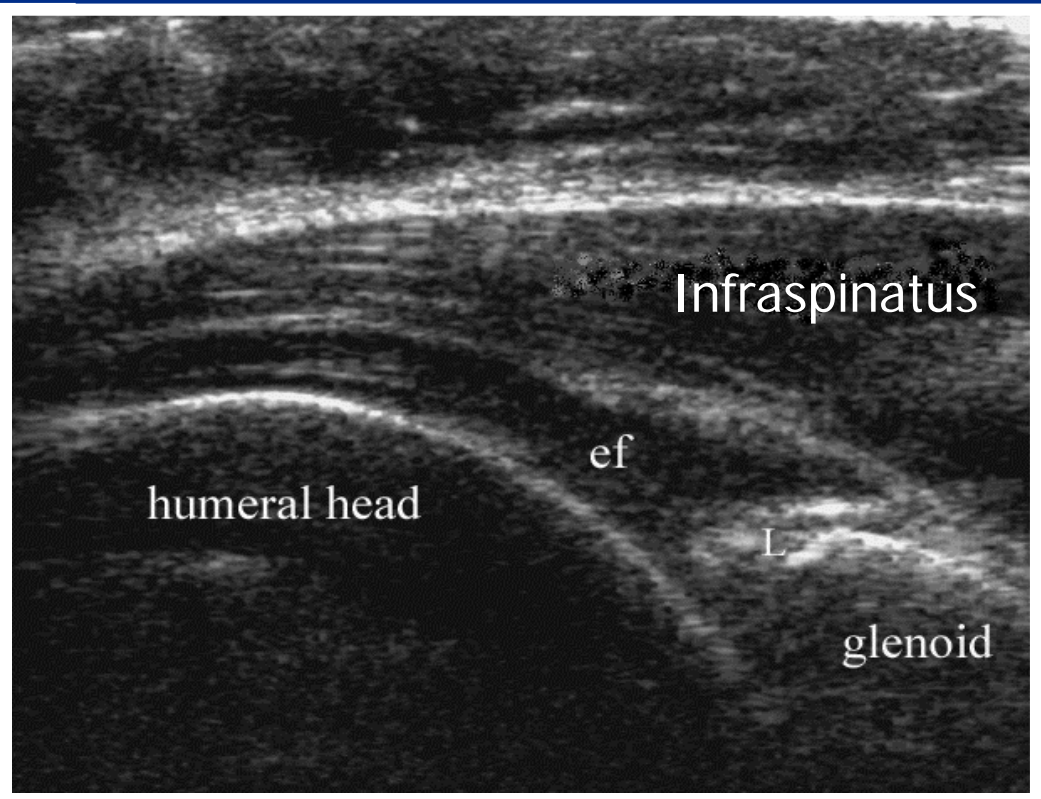
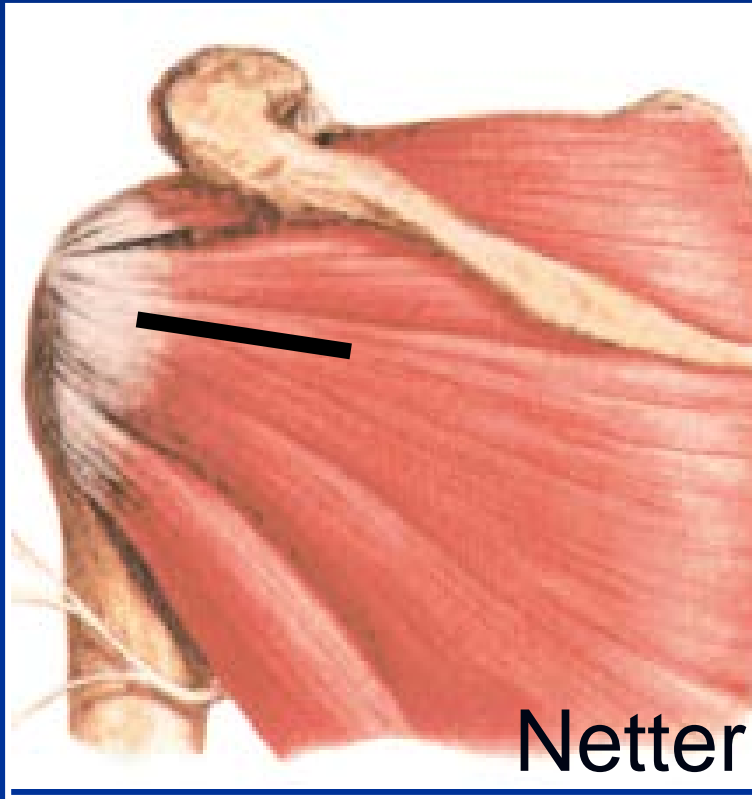


UW Hospital & Clinics L12-5/MSK Gen

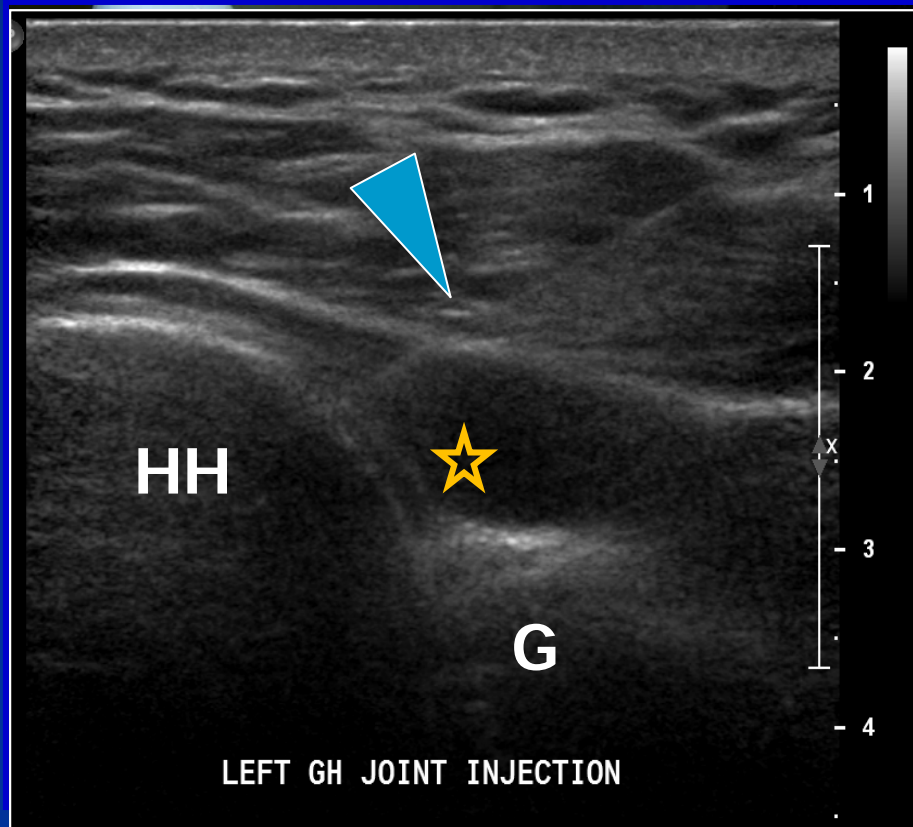


Axial T2

# Posterior Shoulder Joint



# Shoulder Joint Aspiration





# Summary

- US can quickly evaluate the presence of a joint effusion
- US is well-suited for guiding joint aspirations/injections
- 11:30am Interventional Hands-On