Trochanteric Pain Syndrome: Diagnosis and Treatment

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Disclosures

- Consultant: Bioclinica
- Contractor: POCUS PRO
- Advisory Board: Philips
- Book Royalties: Elsevier
- Not relevant to this lecture

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Outline

- Anatomy and Scanning Technique
- Bursal Pathology
- Tendon Injury
- Miscellaneous

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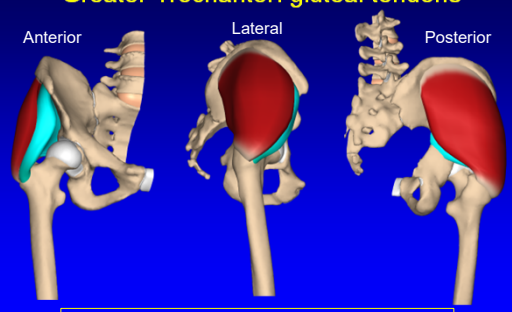
Greater Trochanter: gluteal tendons



Gluteus medius (red) Gluteus minimus (blue)

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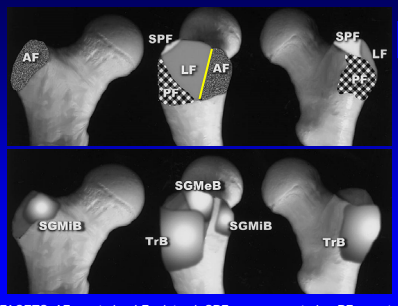
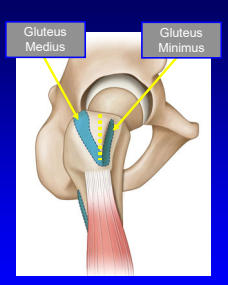
Greater Trochanter





FACETS: AF = anterior; LF = lateral; SPF = superoposterior; PF = posterior
Pfirrmann et al. Radiology 2001; 221:469

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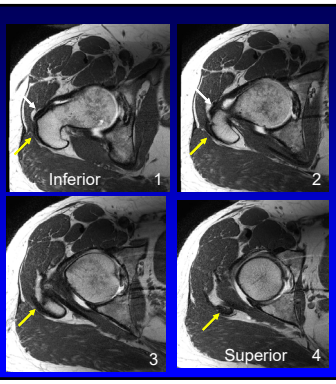
Greater Trochanter

Yellow arrow = gluteus medius
White arrow = gluteus minimus

Axial MRI



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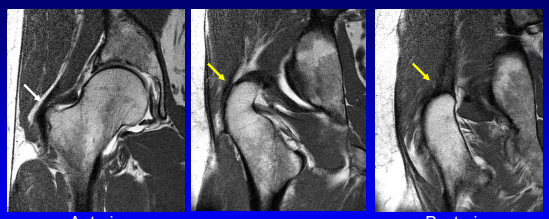
Greater Trochanter



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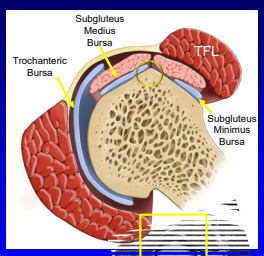
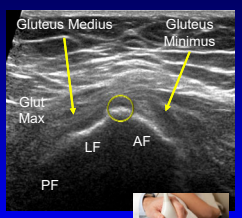
Greater Trochanter





AF: anterior facet
LF: lateral facet
PF: posterior facet

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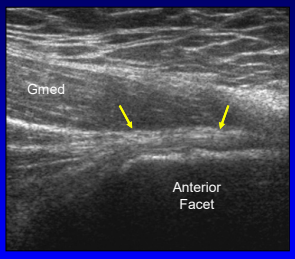
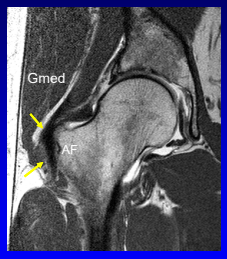
Gluteus Minimus: Long Axis





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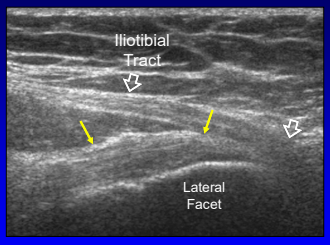
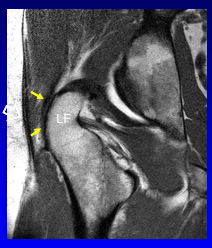
Gluteus Medius: Long Axis





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Trochanteric Pain Syndrome:

- Most commonly caused by gluteus minimus and medius tendon abnormalities[1]
- Trochanteric bursitis: uncommon
  - 20% of symptomatic patients[2]
  - Not actually inflamed[3]
  - Not associated with pain[4]

[1]Kong A et al. Eur Rad 2007; 17:1772
[2]Long SS et al. AJR 2013; 201:1083
[3]Sylva F et al. Clin Rheumatol 2008; 14:82
[4]Blankenbaker DG et al. Skeletal Radiol 2008; 37:903

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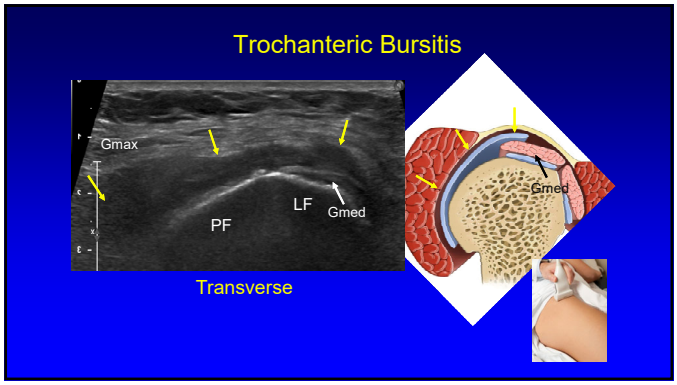

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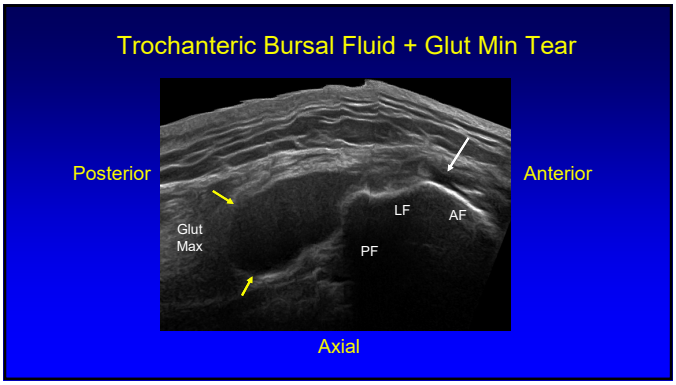

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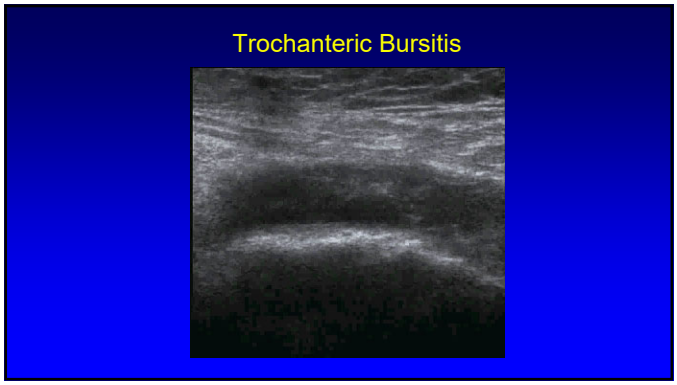

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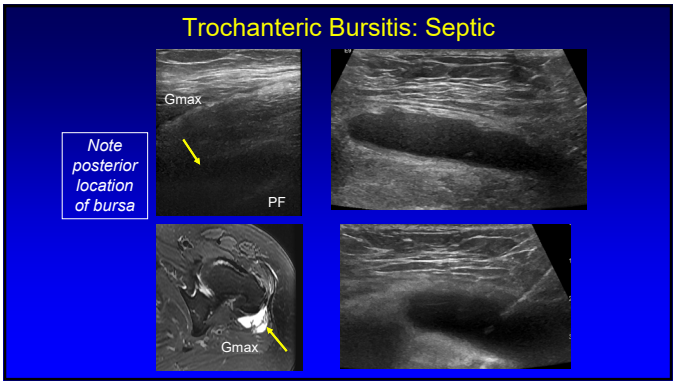

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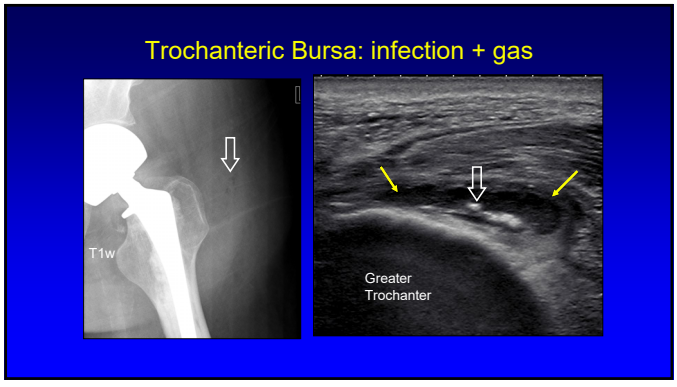

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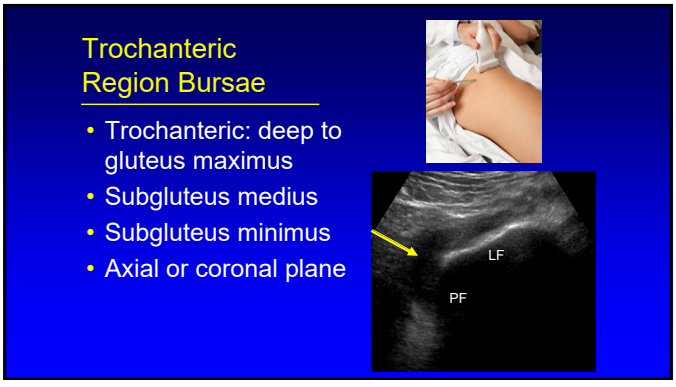

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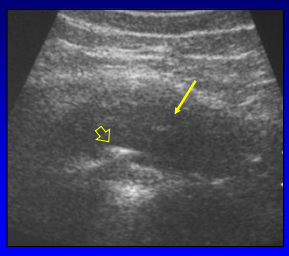
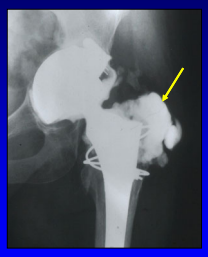
Trochanteric Bursitis



Transverse



Arthrogram

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Muscle and Tendon Injury

- Tear:
  - Anechoic or hypoechoic defect
  - Partial-thickness tear
  - Full-thickness tear: retraction
- Tendinosis:
  - Hypoechoic, enlarged
  - No inflammation (not tendinitis)

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Gluteal Tendon Pathology:

- Tendinosis: hypoechoic, no defects
- Partial tear: anechoic clefts
- Complete tear: discontinuous tendon
- >2 mm cortical irregularity (depth)
  - Associated with tendon tear
  - Positive predictive value = 90% (xray)*

*Steinert et al. Radiology 2010; 257:754

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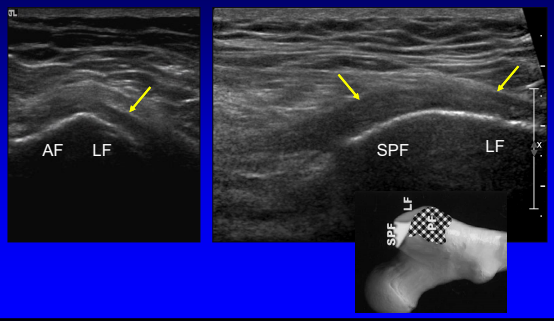
Tendinosis: Gluteus Medius



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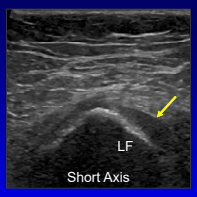
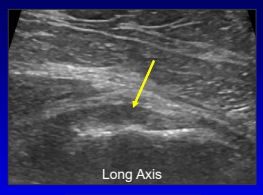
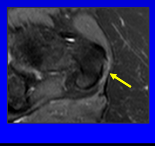
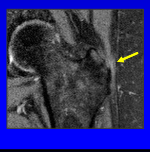
Gluteus Medius: tendinosis









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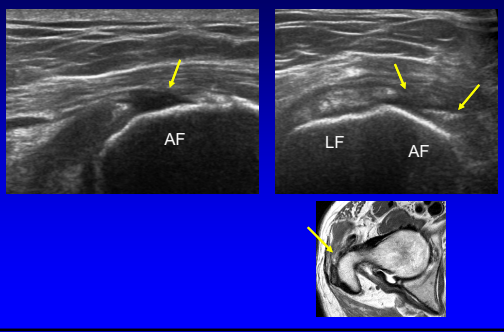
Tear: Gluteus Minimus



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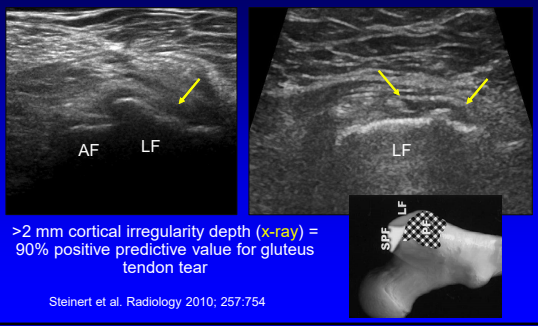
Tear: Gluteus Medius



>2 mm cortical irregularity depth (x-ray) = 90% positive predictive value for gluteus tendon tear

Steinert et al. Radiology 2010; 257:754

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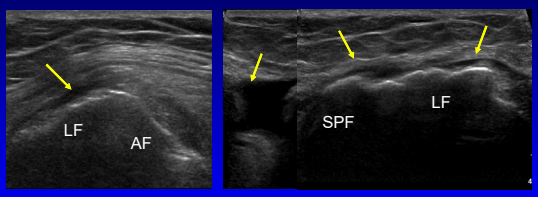
Tear: Gluteus Medius after THA



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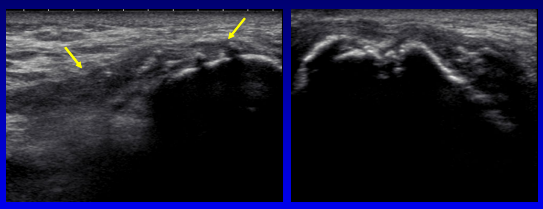
Post-operative: Gluteus Medius



Long Axis Short Axis

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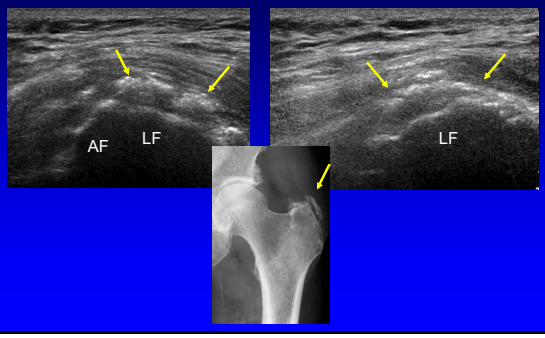
Calcific Tendinosis: Gluteus Medius



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Potential Treatment Algorithm:

- If bursa: aspirate, inject steroids
- If tendinosis:
  - Tenotomy or fenestration
  - Inject steroids superficial to tendon
    - 72% of patients significantly improved[1]
- If tendon tear: platelet-rich plasma injection?

[1]Labrosse, et al. 2010 AJR 2010; 194:202

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Tendon: injury

- Acute tensile overload
  - Usually underlying abnormal tendon
- Chronic overuse: repetitive excessive loading
  - Loss of normal tendon architecture
  - Change in tenocyte morphology
  - Altered collagen fibril distribution and neovascularity
  - Microtears
  - Resulting underuse may contribute

Galloway MT et al. JBJS 2013; 95:1620

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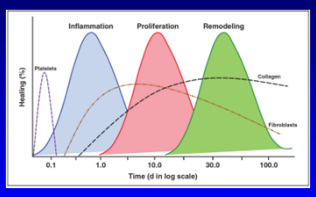
Tendon: healing

- Inflammatory phase
  - First week after injury
  - Fibrin clot
  - Cell migration, neovascularity
- Proliferation phase
  - 1 to 4 weeks
  - Fibroblasts synthesize collagen and extracellular proteins
- Remodeling phase



Galloway MT et al. JBJS 2013; 95:1620
Lee KS, et al. Am J Roentgenol 2011; 196:628

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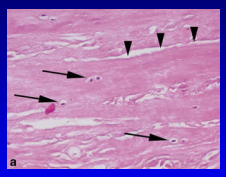
Tendinosis

- Histologic term used instead of tendinitis
- No acute inflammatory cells
  - Primarily mucoid degeneration
- Inflammatory mediators do exist[1]
  - Precise role unknown
- Tendinopathy: non-specific term
  - Any tendon pathology



From: Hodler J, et al. J MRI; 2010: 72:811

[1]Mosca MJ et al. BMJ Open Sport Exerc Med 2018

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Tendon Fenestration

- Also called "dry-needling" or tenotomy or microtenotomy
- Needle repeatedly passed through areas of tendinosis
- Disrupts area of tendinosis
- Bleeding causes release of growth factors
- Stimulates tendon healing

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Fenestration: technique

- No NSAIDS x 2 weeks prior
- Ultrasound guidance: in plane
  - Long axis to tendon
- 20 or 22 gauge needle
- 20 – 30 passes until area soft
- Minimal Lidocaine: over tendon

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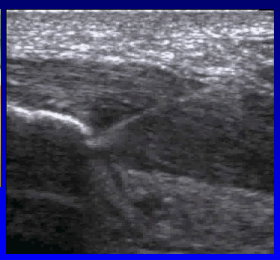
Percutaneous Fenestration



- 20 or 22-gauge needle
- 20 to 30 needle passes
- Continued until area covered and tendon softens

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Fenestration: technique

- Cover entire tendon abnormality
- Contact bone if at tendon abnormality
- Pull needle out of tendon to redirect
- Also redirect medial to lateral
  - Pivoting at needle entrance
  - Cone-shaped area

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Fenestration: technique

- Contraindications:
  - Not delineated in literature
  - Prior steroid injection < 3 months ago
  - Bleeding disorders
  - Infection
  - Tendon tear > 50% thickness?

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Post-procedure:

- No ice
- Rest for 2 weeks
  - Daily activities okay
  - Gradual return to activities
- Follow-up:
  - Referring physician, physical therapy
- No NSAIDS: 2 weeks

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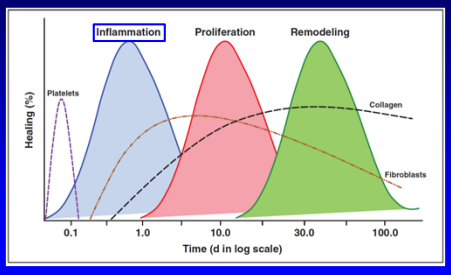
Phases of Tissue Healing



From: Lee KS, et al. Am J Roentgenol 2011; 196:628

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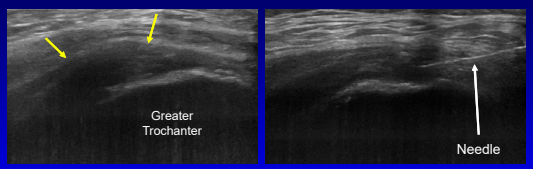
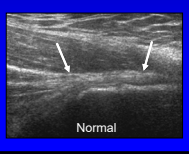
Gluteus Medius





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Gluteus Maximus and Minimus

- Randomized controlled: 30 patients
- PRP versus fenestration alone
- Significant improvement at weeks 1 and 2
- Approximately 80% had long term improvement: up to 1 year follow-up
- No difference between treatment groups[1]
- Two injections: more sustained response[2]

[1]Jacobson JA et al. J Ultrasound Med 2016; 35:2413
[2]Fitzpatrick J et al. Am J Sports Med 2019; 47:1130

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Snapping Hip Syndrome

- Painful snap with hip motion
- Intraarticular
- Extraarticular:
  - Anterior: iliopsoas tendon
  - Lateral: iliotibial tract or gluteus maximus

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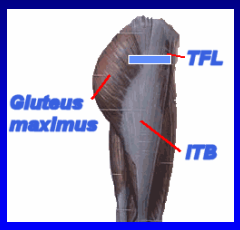
Snapping Hip: lateral

- Transverse over greater trochanter
- Hip external rotation / flexion
- Abrupt motion of iliotibial tract or gluteus maximus over greater trochanter



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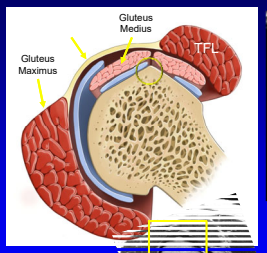
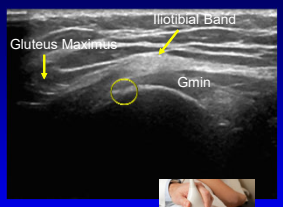
Snapping Gluteus Maximus / Iliotibial Band





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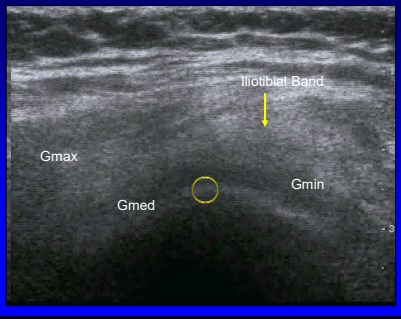
Snapping Hip Syndrome: *iliotibial tract*



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Take-home points:

- Trochanteric anatomy
- Bursitis: rare
- Gluteal tendons abnormalities: frequent
- Tendon treatment algorithm
- Snapping hip: dynamic

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Thank you!
Syllabus on line and other educational material:
www.jacobsonmskus.com
Twitter handle: @jjacobsn

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